



ArcGIS Dashboards Classic



Table of Contents

Dashboard essentials

- What is a dashboard 5
- Create a dashboard 7
- Dashboard layout 9
- Configure an element 11
- Change theme 13
- Save a dashboard 14
- Share a dashboard 15
- Find a dashboard 16
- Delete a dashboard 17

Dashboard elements

- Header 19
- Side panel 20
- Map element 21
- Map legend 23
- Serial chart 24
- Pie chart 30
- Indicator 31
- Gauge 33
- List 35
- Details 36
- Rich text 37
- Embedded content 38

Include data

- Understand data sources 41
- Data series 44
- Field types and coded strings 46
- Filter data 47
- Date-based filter conditions 50


Format Data

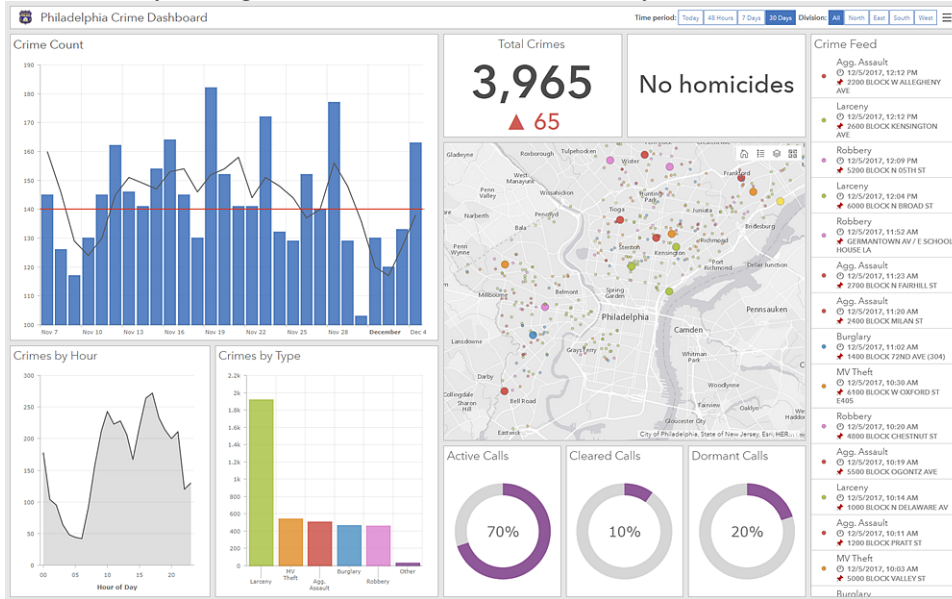
- Format dates 56
- Parse dates 58

Format numbers	61
Convert values	63
Unit prefixing	64
Interactive dashboards	
Actions	66
Selectors	69
URL parameters	72
Configure actions on dashboard elements	81
Configure actions on URL parameters	88
Charts as the source of actions	93
Design	
Dashboard settings	96
Use custom icons	98
Effective use of HTML	99
Share	
Dashboard URLs	102
Secured and subscriber content	103
Reference	
FAQ	105
Requirements	106
Best Practices	
Create web maps for dashboards	108
Author effective dashboards	109
Dashboards on your smartphone	111

Dashboard essentials

What is a dashboard

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. Similar to [web maps](#) and [web layers](#), dashboards are part of the [ArcGIS geoinformation model](#). They are [items](#) within your organization that can be identified by their icon  when [browsing and searching](#) for content.



There are many reasons to create a dashboard, and many types of dashboards you can create. Dashboards allow you to do the following:

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

The type of dashboard you create is based on who you're sharing it with and the information 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 are more strategic and are ideal for executives and other senior managers interested in monitoring their organization's key performance indicators (KPIs) and metrics. Some dashboards are more analytical and are used to identify data trends or other interesting data characteristics. Last, some are simply informative and are used to tell a story with the data.

Dashboards are created to be intuitive and easy to understand by different teams and people within and outside of an organization. Example users include command chiefs, operations managers, senior executives, GIS managers, GIS analysts, and community members.

Dashboards are composed of configurable elements, such as [maps](#), [lists](#), [charts](#), [gauges](#), and [indicators](#), and occupy 100 percent of the application browser window. Elements can be stacked or grouped together in various ways.

The following are characteristics of an effective dashboard:

- Draws your attention to where it's needed
- Shows what's most important on a screen full of data
- Provides its audience the ability to understand what's happening and respond quickly
- Expresses performance measures clearly, accurately, directly, and without distraction

Most elements are data driven—they represent the information you want to present to the intended audience. As such, dashboards offer [filtering capabilities](#), which enable a refined set of data to be presented to the intended audience. These filters can be applied at design time by the dashboard author or at run time by users viewing the dashboard.

Dashboards can be designed for use in both unattended and attended scenarios. Unattended dashboards are often displayed on a large screen in environments such as operations centers, and provide a more passive user experience. In contrast, attended dashboards are generally viewed on desktop monitors or tablet devices and tend to offer a more [interactive](#) user experience.

Once the dashboard is assembled, you can [share](#) it with its intended audience. You can share dashboards publicly with everyone or only with people in your organization. You can promote your dashboard by providing a link to it or embedding it in another website or app.


To get started making your own dashboard, see [Create a dashboard](#).

Create a dashboard

ArcGIS Dashboards provides the tools to create compelling dashboards with your data. Before you begin to create your dashboard, verify that you are signed in to your organization with [privileges](#) to create content.

For help creating a dashboard using ArcGIS Dashboards Classic, see the [ArcGIS Dashboards Classic documentation](#).


To create a dashboard, complete the following steps:

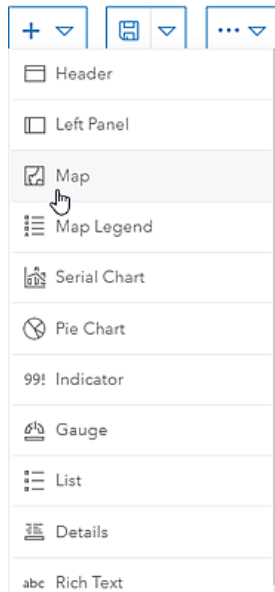
1. Click the app launcher button  in the header of your site and click **Dashboards**.
2. Click **Create dashboard**.
3. Provide a title for your dashboard.
4. Optionally, specify search tags, a summary, and a target folder.
5. Click **Create dashboard**.

Dashboards can also be created from Map Viewer, Map Viewer Classic, the gallery, content page, or item page in your organization. For more information, see [Create apps from maps](#).

Add elements

Once you have created your dashboard, you will need to add elements to begin creating visualizations.

To add an element to your dashboard, click **Add +** and choose an element from the menu, such as **Map** .






Tip:

Consider adding one or more [map](#) elements to your dashboard first, because a web map's operational layers can serve as the [data sources](#) for other elements.

After you add an element to a dashboard, hover over the upper corner of the element to display the menu. You can access all of an element's settings through this menu. The buttons on the menu are as follows, from top to bottom:

- **Drag item** 


- **Configure element** 
- **Duplicate element** 
- **Delete element** 

Dashboard layout

A dashboard is composed of one or more elements that are designed to always occupy 100 percent of your browser window. When you resize your browser, the elements resize to fit.


Most dashboard elements can be rearranged in numerous ways. They can be moved, docked, resized, grouped, and stacked. The only elements that can't be rearranged are the [header](#) and [side panels](#). These occupy a predefined space on a dashboard (although a side panel can be retractable at run time), and a dashboard can only have one of each.

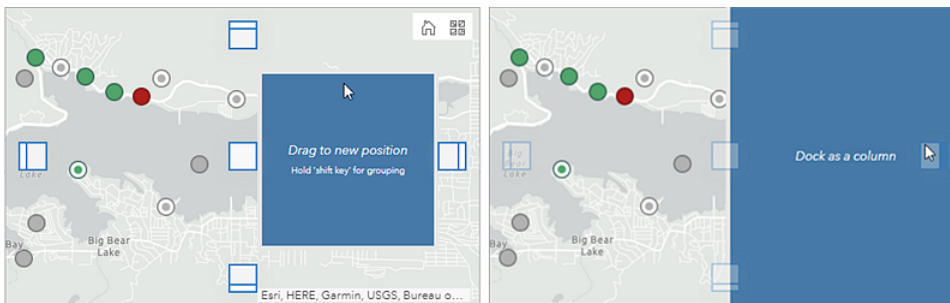
Tip:

As you are working on your dashboard's layout, save your work. To create a duplicate of your dashboard, click the arrow next to **Save** , and click **Save As**.

Move an element

You can move elements to rearrange them and dock them to specific sections of your dashboard.

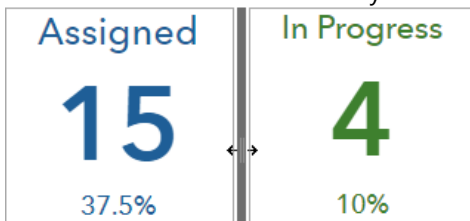
To rearrange the elements on a dashboard, click **Drag item**  while moving the element toward the indicator for the desired position on the dashboard. Release the mouse button when the hint text changes from **Drag to new position** to text that includes **Dock as**, such as **Dock as a column**.



You can dock elements as rows or columns. Elements can be docked to sections of the dashboard or to sections of other elements. For example, you can dock an element as a column to the right side of your dashboard, or you can dock an element as a column to the right side of another element.


Resize an element

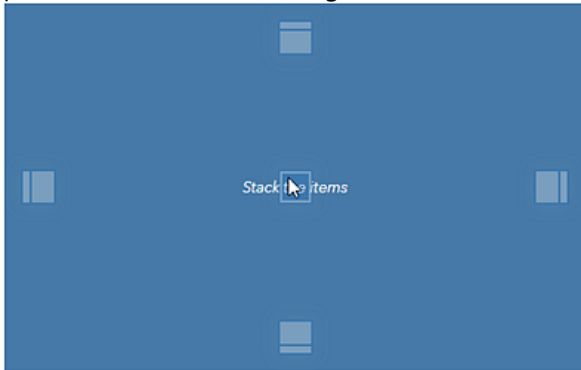
To resize an element, hover over its vertical or horizontal border until the pointer changes to crosshairs. Then drag the border until the element is your desired size.




Stack elements

You can stack two or more elements on top of each other to create tabs for each element. When elements are stacked, only one element from the stack is visible at a time and the other elements are hidden. The tabs allow you to select which element is shown.

To stack two elements on top of each other, click **Drag item**  while moving the element toward the center position indicator of the target element. Release the mouse button when the hint text changes to **Stack the items**.




Once an element has been added to the stack, a new tab is created. Tabs can be renamed by clicking the tab and clicking the **Edit** button .

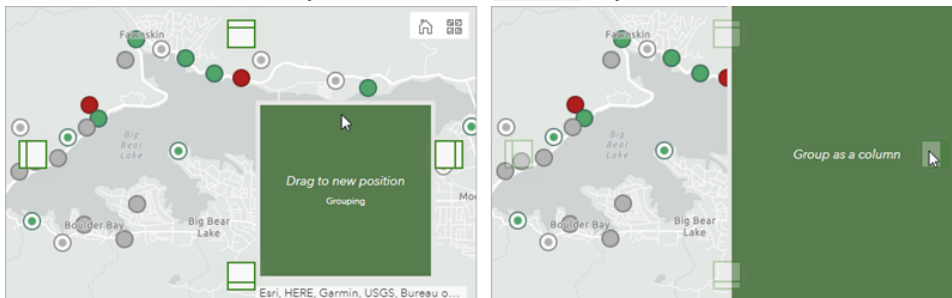
Group elements

You can group elements to keep them together when configuring your dashboard layout. Unlike stacking, grouping elements will not hide the other elements in the group. Grouping allows you to move and resize the elements as if they were only one element.

Note:

Stacked elements cannot be grouped.

To group two elements, click **Drag item**  while moving the element toward the center position indicator of the target element as if you are stacking elements. However, before releasing the mouse button, press and hold the **Shift** key. This will cause the position indicators and the element you're moving to turn green. Release the mouse button when the hint text changes to text that contains **Group as**, such as **Group as a column**. Be sure to release the mouse button before you release the **Shift** key.



Configure an element

After an element has been added to a dashboard, it needs to be configured. The exact details for each element differ, and the following is presented as general information only. For configuration details specific to an element, see that element's topic under the Dashboard elements section of this help system.

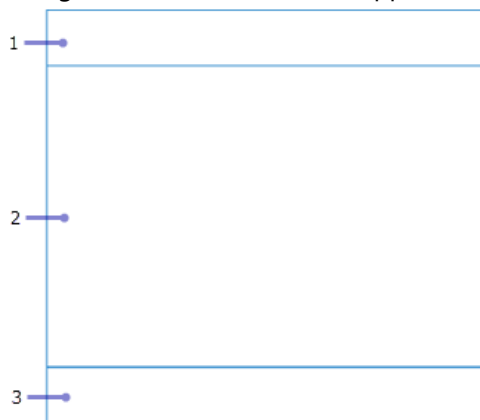
Many elements have too many configuration settings to fit on one screen. When this occurs, a series of tabs appears vertically along the side of your screen. When clicked, each tab presents information that corresponds to a particular aspect of configuring that element. The following image shows the configuration for a [serial chart](#), with the **Data** tab highlighted.

The screenshot shows the configuration interface for a serial chart. On the left is a vertical sidebar with tabs: Data (highlighted), Chart, Category Axis, Value Axis, Guides, Series, and General. The main content area is titled 'Data Options' and includes a 'Show data table' button. Below this, it shows 'Using "Crime_Incidents" layer' with a 'Change' button. A 'Filter' section has a '+ Filter' button. The 'Categories From' section has three tabs: 'Grouped Values' (selected), 'Features', and 'Fields'. The 'Series' section has a 'Category Field' dropdown menu. The 'General' section has a 'Parse Dates' toggle switch. Below that is a 'Split By Field' dropdown menu. The 'Statistic' section has a 'Count' dropdown menu. At the bottom, there is a 'Sort By' section with a '+ Sort' button.

Note:

When an element does not need more than one tab to capture all the necessary configuration information, no tabs appear. For example, [header](#), [side panel](#), and [rich text](#) do not require tabs.

To understand the settings on the various tabs, think of the element as having three distinct areas: a title area, an area for the visualization, and a description area, which are labeled 1, 2, and 3 in the following image, respectively. The title and description areas are configured on the **General** tab. The visualization area is based on settings configured on the **Data** tab (if applicable) and any other element-specific tabs you see.



General settings

In many cases, the general settings for an element appear on the **General** tab, although not all elements have tabs. The most common general settings are described below:

- **Name**—When each element is added to a dashboard, it is assigned a name. If your dashboard will be a relatively static representation of data, it is acceptable to leave the name as its assigned default. However, if your dashboard will provide a more interactive experience, assigning an easy-to-interpret name will make configuring dashboard [actions](#) easier.
- **Title**—An area at the top of the element to place a title or other useful information. This information is configured as rich text. See [Effective use of HTML](#) for more information. If a title is not specified, this area can be occupied by the data visualization. Titles larger than 30 percent of an element's height will cause scroll bars to appear. If this does not meet your needs, consider using a [rich text](#) element and grouping it to the element being configured instead.
- **Description**—An area at the bottom of the element to place useful information. This information is configured as rich text. See [Effective use of HTML](#) for details. If a description is not specified, this area can be occupied by the data visualization. Descriptions larger than 30 percent of an element's height will cause scroll bars to appear. If this does not meet your needs, consider using a [rich text](#) element and grouping it to the element being configured.
- **Last Update Text**—The last time the element's layer was refreshed. This setting is enabled by default and always appears at the lower corner of the element's description area.
- **No Data**—For data-driven elements, choose to configure a label that displays when there is no data to render on the element. By default, an element in this state will display the label No Data.

Data settings

Most dashboard elements are data driven and require that you select their [data source](#) as the first step of configuring them. In the case of the [map element](#), you are prompted to select a web map. In the case of other elements, such as [indicator](#), [gauge](#), [list](#), and [details](#), you are prompted to select a layer.

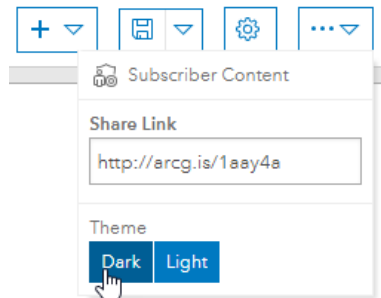
Tip:

If you've previously added other elements to the dashboard, their data sources will appear as options you can select when adding new elements. For example, if you've previously added a map element, its operational layers will appear as potential data sources when adding other elements.

When configuring a data-driven element, a **Data** tab is available. You can change the data source on this tab if needed. You can also [apply filters](#). For some element types, there are element-specific data settings. For example, both the [indicator](#) and [gauge](#) elements have a **Value Conversion** setting that is used to convert values from one unit of measure to another at run time.

Change theme

If your dashboard will be used in low light, consider switching its theme from light to dark, which makes the dashboard more readable and results in less eye strain in dark environments. To change the theme, click **Options** **...**, and under **Theme**, click **Dark**.




If you have a map element in your dashboard, consider also making the basemap dark to match the theme. Note that if you change the basemap in the dashboard, your changes will not be saved. To permanently change the basemap, you must change it in the web map item in your organization. See [Choose basemap](#) for details.

For more theme customization, including element background color, tab color, and selection color, use the [dashboard settings](#).



Save a dashboard

Once you are satisfied with the content and appearance of your dashboard, click **Save** .



If you want to create a duplicate of your dashboard, click the arrow next to **Save**, click **Save As...**, and specify a title, tags, a summary, and a folder for the duplicate.

Share a dashboard

Once you are finished configuring your dashboard, share it with its intended audience. Without sharing your dashboard, only you and organization members with privileges to view content owned by other members can access it. Along with other items in your organization, you can share dashboards publicly with everyone, only the people in your organization, or specific groups. There are multiple points from which you can share a dashboard, such as the Dashboards home page, the **My Content** tab of your organization, and the item details page of the dashboard. This topic explains how to share the dashboard from the Dashboards home page. For details on how to share your dashboard from your organization, see [share items](#).

1. [Save your dashboard](#), click **Home** and from the menu, click **Dashboards** to go to the Dashboards home page.
2. On the **My Dashboards** tab, find the dashboard you just created.
It appears near the top of the screen if you just created it. If necessary, find the dashboard by typing its title in the filter box.
3. Hover over the dashboard's card and click **Item Details** ⓘ.
The dashboard's item details page appears.
4. Click **Share**, specify who you want to share the dashboard with, and click **OK**.
For details on sharing settings, see [Share items](#).

Note:

You also need to share any web maps and web layers used in the dashboard with users as well. See [Share items](#) for details.

5. After configuring your sharing settings, you can promote your dashboard by sending a URL to users or embedding the dashboard in another website.
 - To send a link to users, in edit mode in your dashboard, click **Options** ... and copy and paste the link under **Share Link** into an email or document.
 - To embed your dashboard into a website, see [Embed an app](#).

Caution:



Make sure your dashboard is [shared with everyone](#) so that anyone viewing your website can also view the dashboard.

Find a dashboard


There are several ways to locate and view a dashboard that's been shared with you.


When a [dashboard is shared](#) with you, you can access it from the Dashboards home page or from your organization's portal. This topic discusses how to find a dashboard from the Dashboards home page. You can find a dashboard from the portal in the same way you would search for any other item. See [Browse and search content](#) for details.

How you find a dashboard from the Dashboards home page depends on who the item was shared with and your organizational role as follows:

- If the dashboard was shared with your organization, you can find it on the **Shared Dashboards** tab of the home page, which contains all dashboards shared with your organization. You can find a dashboard by filtering by its title or clicking **Sort by time**  or **Sort alphabetically**  to sort the dashboards by time or title, respectively.
- If the dashboard was shared with your group, on the **Shared Dashboards** tab, click the **All shared dashboards** drop-down menu and choose your group name to see the dashboards only shared with your group.
- If the dashboard was shared with everyone, and you are not a member of the author's organization, you can sign in to your organization and search **All Content** for the dashboard. See [Browse and search content](#) for details.

View the dashboard

Once you've found the dashboard, you can view it by hovering over its card and clicking **View Dashboard** or clicking **View**  at the bottom of the card.


You can also view your dashboard while you're editing it, to ensure it looks good and works properly for users, by clicking **Options**  and copying and pasting the link under **Share Link** into another browser tab. The dashboard will look the same as it does in edit mode, except it doesn't have the authoring toolbar at the top of the screen or the configuration menus that appear when you hover over elements.

Caution:

If you send this link to users before you adjust the dashboard's sharing settings, they won't be able to view your dashboard. By default, your dashboard is not shared with anyone. See [Share a dashboard](#) for details.

Delete a dashboard

You can delete a dashboard you created from the Dashboards home page or your organization as follows:

- From the home page, click **Delete dashboard**  on the dashboard's card, and confirm that you want to delete the dashboard.
- From your organization, you delete a dashboard in the same way as any other item. See [Manage items](#) for details.

Dashboard elements

Header

A header is a reserved area along the top of your dashboard that can be used for giving your dashboard a unique identity, applying corporate branding standards, and providing links to additional content. It can also be used in interactive dashboards to host one or more [selectors](#). A dashboard can only have one header, and it's designed to always occupy the entire width of a dashboard.



Tip:

Rich text elements can be used throughout a dashboard as substitutes for headers. They can be useful when you don't want an element that conforms to the header's size and position restrictions. For example, you could use a rich text element to clearly mark different sections in your dashboard.

The header can be one of three sizes. The following table shows the heights of these sizes and the recommended dimensions of logos to insert into these headers. The URL for a header's logo can point to a Scalable Vector Graphics (.svg) file. In that case, the image will automatically scale to the header's size. If you use other image formats, the following dimensions are suggested. Note that images larger than the suggested sizes will be scaled down, but images that are smaller than these sizes will not be scaled up.

Header size	Header height (px)	Logo dimension (px)
Small	32	24x24
Medium	44	32x32
Large	62	48x48

The following are tips for using URLs:

- URL references should use HTTPS. If an HTTPS connection is not possible, consider using a relative URL, which doesn't specify HTTPS or HTTP. For example, use `//www.example.com/logo.png`.
- If you don't want to use the above tip, consider leveraging your organization's ability to [add image files](#) as items in your organization's content. After adding the new item, [share it with everyone](#). This will produce a URL on the image's [item details](#) page that can be used in a dashboard.
- If the URL references a domain that differs from yours, the server hosting the requested resources should support CORS requests from your domain.

Side panel

The side panel is used in interactive dashboards to host one or more [selectors](#). A dashboard can only have one side panel, which has a fixed size and position along the dashboard's edge, although you can configure it to be retractable at run time.

Filters

Divisions

- All
- CPD
- EPD
- NEPD
- NRPD
- SPD
- SWPD

Crime Type

- All
- Agg. Assault
- Burglary
- Larceny
- Murder
- MV Theft
- Robbery

Refine Date Range

10/1/2017

10/31/2017

Map element

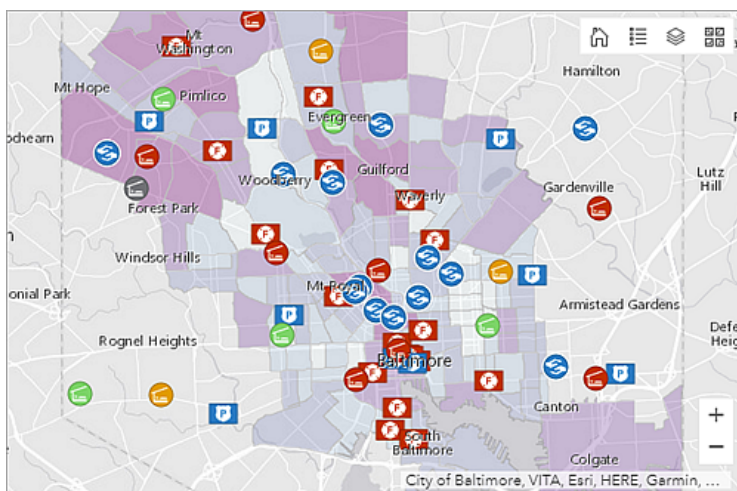
Maps play a central role in many dashboards. Not only are they often the most effective way to display your geographic information, but their operational layers can also be used by other data visualizations on the dashboard to create interesting, intuitive, and compelling information products. Map elements display web maps authored in applications such as your organization's Map Viewer Classic. See [Create web maps for dashboards](#) for best practices.

Note:

A dashboard can contain multiple map elements, or none at all. When it doesn't contain any, you can create the dashboard entirely with web layers available to you. See [Understand data sources](#) for details.

The map element includes settings that can be switched on or off at design time:

- **Pop-ups**—Displays descriptive information about a feature when clicked. For more information, see [Configure pop-ups](#).
- **Scalebar**—Displays a scale bar in the lower corner of the map. The supported styles are line and ruler. When users are signed in, the display units reflect their profile settings. For anonymous access users, the style is always line and the units are dual (both United States and metric).
- **Default Extent and Bookmarks**—Provides preexisting bookmarks on your map and a way to return to the map's initial extent.
- **Legend**—Displays the map's legend.
- **Layer Visibility**—Allows you to switch operational layers on or off.
- **Basemap Switcher**—Allows dashboard users to change the basemap at run time.
- **Search**—Allows users to find locations or search features on the map. By default, search uses settings configured in the web map. If these are not set, Dashboards uses the ArcGIS World Geocoding Service. For more information, see [Search locations and features](#).
- **Zoom In/Out**—Allows you to zoom in or out on a map.
- **Point Zoom Scale**—Allows you to set the zoom scale used when a zoom [action](#) is configured on a map.

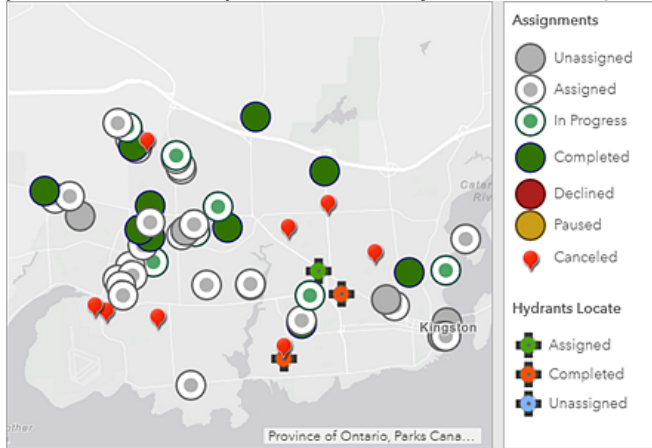


A map and its operational layers can be important in interactive dashboards. Both can be either the source or the target of an [action](#). The following are some examples:

- Map as the source of an action—A change in the map's extent filters the contents of one or more other dashboard elements. This can change the extent of another map element.
- Map as the target of an action—A selection on a dashboard element such as a list or category selector triggers a map to pan or zoom to the selected feature.
- Operational layer as the source of an action—Selecting one or more features in an operational layer filters the contents of one or more other dashboard elements. This can also change the extent of another map element.
- Operational layer as the target of an action—A selection on an element such as a list or category selector filters the operational layer to show only what was selected.

Map legend

In general, a map legend conveys the meaning of symbols that represent map features. It is particularly useful when the map has multiple operational or thematic layers. The legend element displays the legend of the [web map](#) you've created for your dashboard, just like the [map element](#) displays this web map.



Since the contents of your web map determine the contents of the legend element, the order in which layers appear in the web map reflects the order in which they appear in the legend element. Also, if a layer's visibility is switched on or off in a web map, the legend element updates with these changes. Additionally, the legend element respects visible scale ranges in your web map. For instance, if a layer is not visible in your web map due to scale range thresholds, it will not appear in the legend element. Finally, if you have set a layer to be [hidden in the web map legend](#), it will also be hidden in the legend element.

Note:

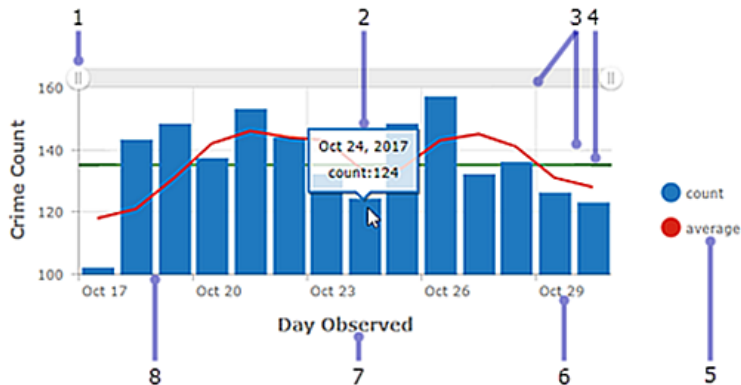
If you haven't already added a map element to your dashboard, the legend element will not appear in the **Add** menu on the dashboard's navigation bar. If you've already added multiple map elements to your dashboard, you need to specify which map element the legend element is based on.

The legend element is different from the legend map tool. While the element is added to a dashboard from the **Add** menu, the tool is included in the dashboard through configuring the map element. Also, the element is always visible after it's added to a dashboard unless it's [stacked](#) with another element, whereas the tool is only visible when clicked. See [Map element and tools](#) for details about the legend tool.

Serial chart

A serial chart visualizes one or more [series](#) of data points along a horizontal (x) axis and a vertical (y) axis. Serial charts get their name from an ability to show more than one series of data. In the following chart, there are two series of data: one showing crime counts by day and the other showing a three-day rolling average of crime counts. Each series in a serial chart has a type that determines the way the data points are visualized. In the following example, the series showing crime counts by day has the bar type and the series showing the three-day rolling average of crime counts has the line type.

The components of a serial chart are further described below.



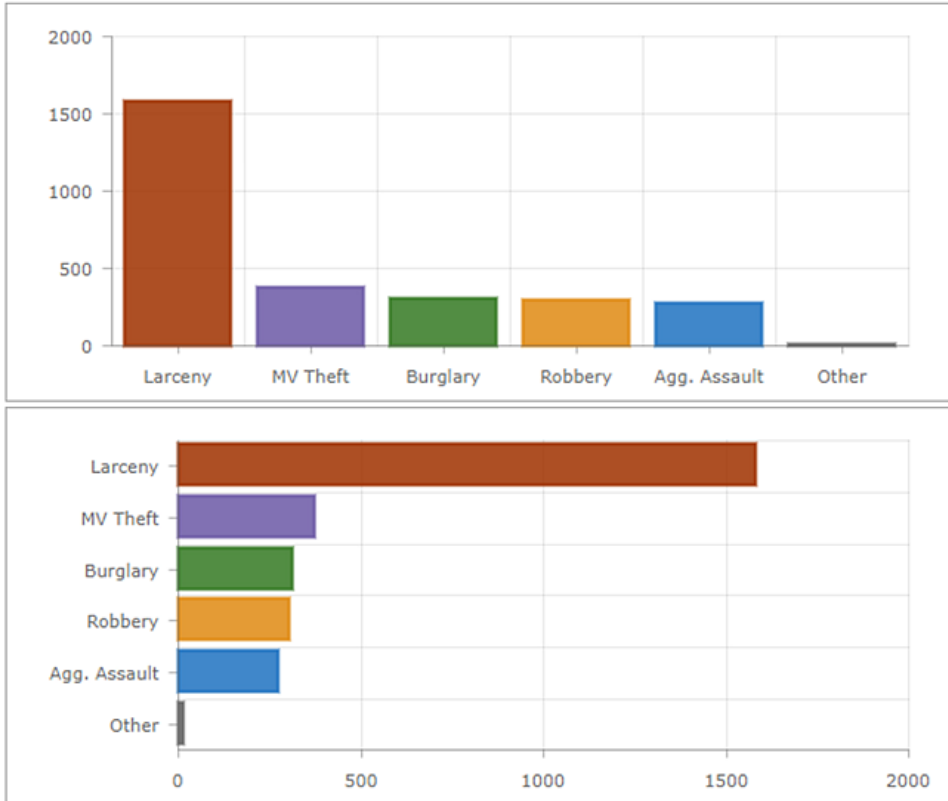
1. Scroll bar—Controls the number of data categories displayed.
2. Hover text—Displays additional information about a data point while you hover over it.
3. Grid lines—Improve chart readability. You can control how horizontal and vertical grid lines are displayed.
4. Guides—Provide context to the data being displayed on a chart by representing goals or thresholds. Guides can be lines that represent a single value, or a shaded area that represents a range of values. In addition, serial charts can have multiple guides.
5. Legend—Conveys the meaning of colors used in the chart. How you configure the data in the chart determines the position of the chart's legend.
6. Label—Describes categories and values. Labels are automatically generated; however, you can override them at design time. For instance, when the category axis shows dates, you can adjust their display through [date formatting](#). You can also control value axis labels through [unit prefixing](#) or [number formatting](#).
7. Axis title—Summarizes the types of categories or values shown on the axis. Each axis can have its own title.
8. Axis—One axis in a serial chart displays the category of each data point, while the other axis displays its numeric value. The category axis can show discrete values or continuous values such as dates. In the previous chart, the categories are displayed along the horizontal axis, and the values are displayed along the vertical axis. However, this setup could be reversed. The vertical bars could be displayed horizontally by changing the orientation of the axes, so that the horizontal axis displays values and the vertical axis displays categories.

In an interactive dashboard, a serial chart can be the source or target of an action. When used as the source of an action, the chart can be configured for single or multiple selection mode. This determines the number of data points that can be selected at a time. When a chart is the source of an action, it can, for example, trigger a map to pan or zoom, or filter another dashboard element (see [Charts as the source of actions](#)). Conversely, when a chart is the target of an action such as a map extent change, the chart can be filtered so the data it displays corresponds with the map's new extent.

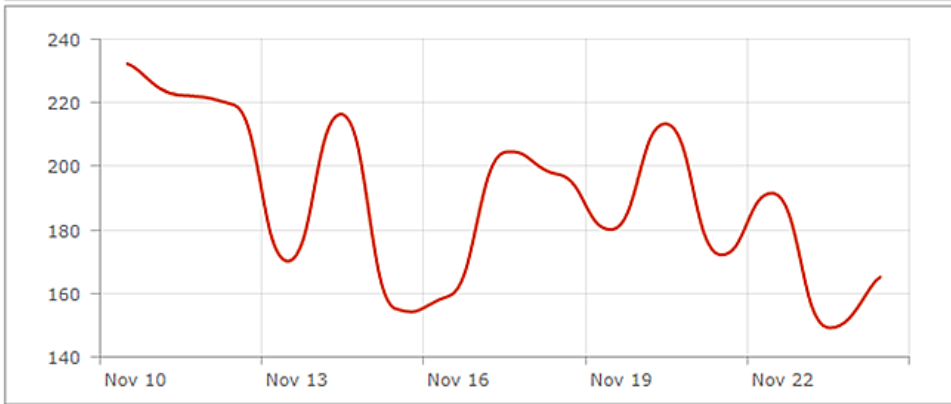
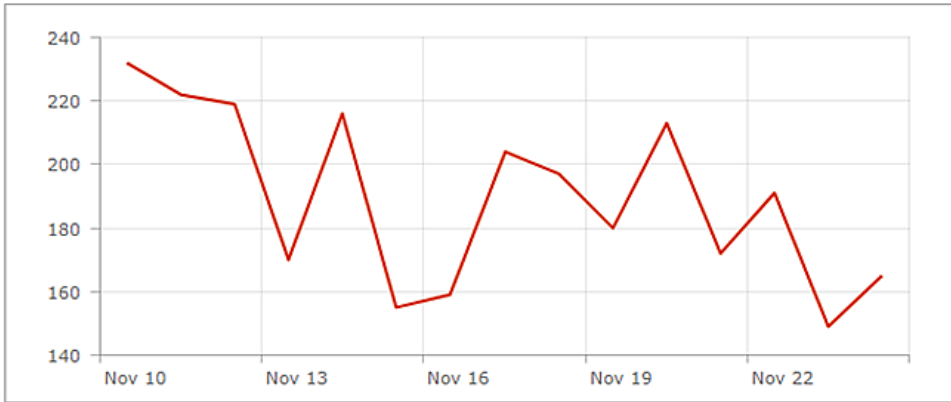
Series types

Series types include bar, line, and smooth line. Each series type is best suited for a different data type.

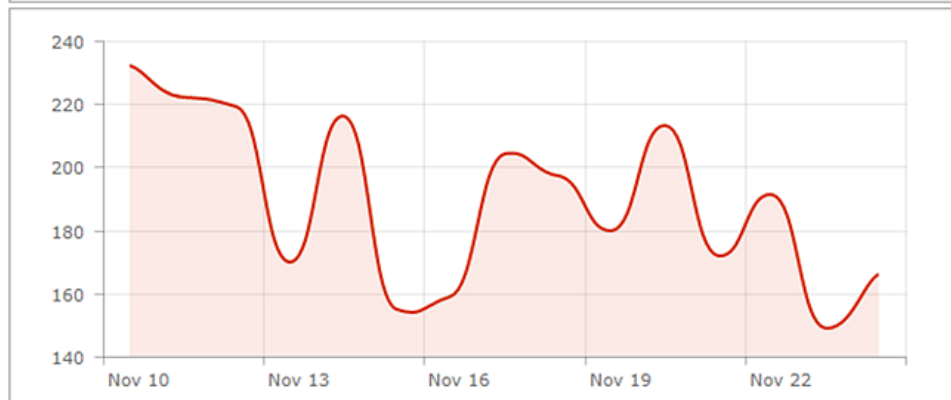
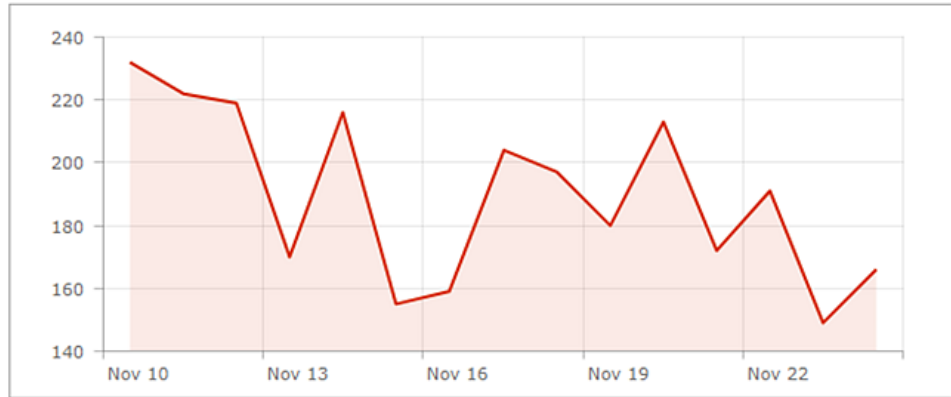
On a bar chart, data points in the series are represented by a box where the height of the box is determined by the points' numerical values. Bars can be horizontal or vertical, depending on the chart's orientation. Bar charts are best suited for data with discrete categories, but they can also be used to display data with continuous categories.



In contrast, data with discrete values is not suitable for line and smooth line charts because the data points in these series are connected. These types of charts are most appropriate for data with continuous categories such as dates.



Line and smooth line charts can be turned into area charts by increasing their fill opacity.



Multi-series charts

There are two ways to create multi-series charts. The method you use depends on how your chart's categories are determined from its data. If your chart's categories are based on grouped values, you can create a multi-series chart by specifying **Split By Field**. If your chart's categories are based on features, you can manually include multiple series in the chart by clicking **+ Series**. See [Data series](#) for details on how to determine the basis of your chart's categories.

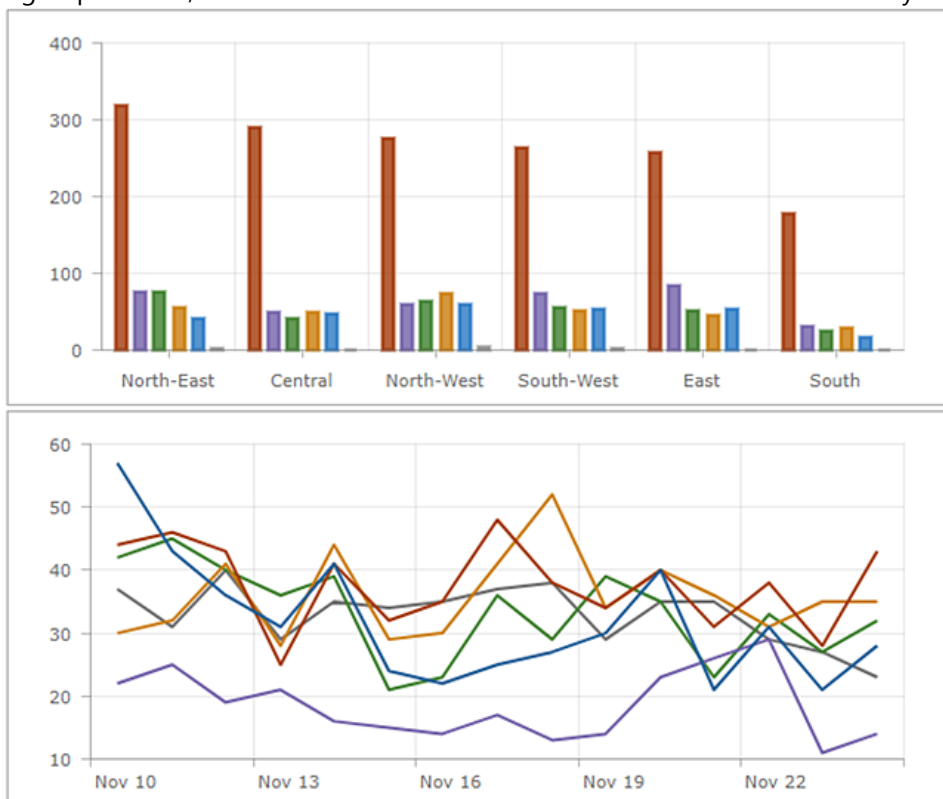
When each series in a multi-series chart is a different type, such as the first chart in this topic, it is considered a combo chart. When all the series are the same type, they can be [grouped](#), [stacked](#), or [100% stacked](#).

Tip:

The value axis of a single-or multi-series chart can have a logarithmic scale, but not when the series are stacked or 100% stacked.

Grouped charts

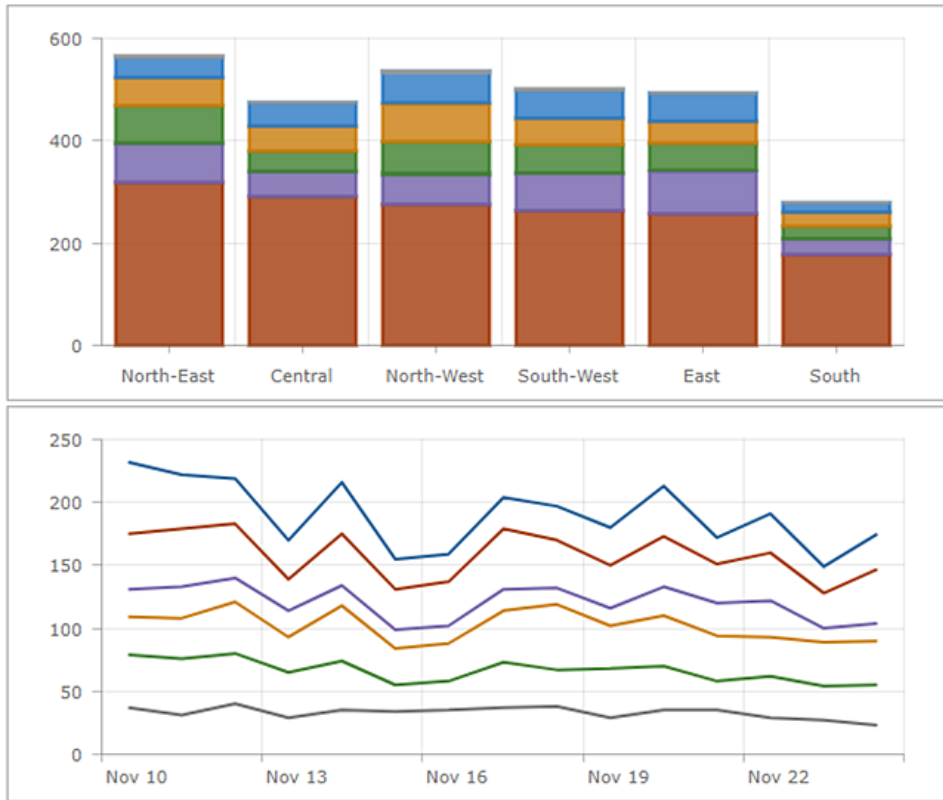
Grouped charts are used for showing information about different subgroups of main categories. A separate bar or line represents each of the subgroups, which are displayed in different colors to distinguish them. When configuring a grouped chart, be sure to limit the amount of information to ensure it's easy to understand.



Stacked charts

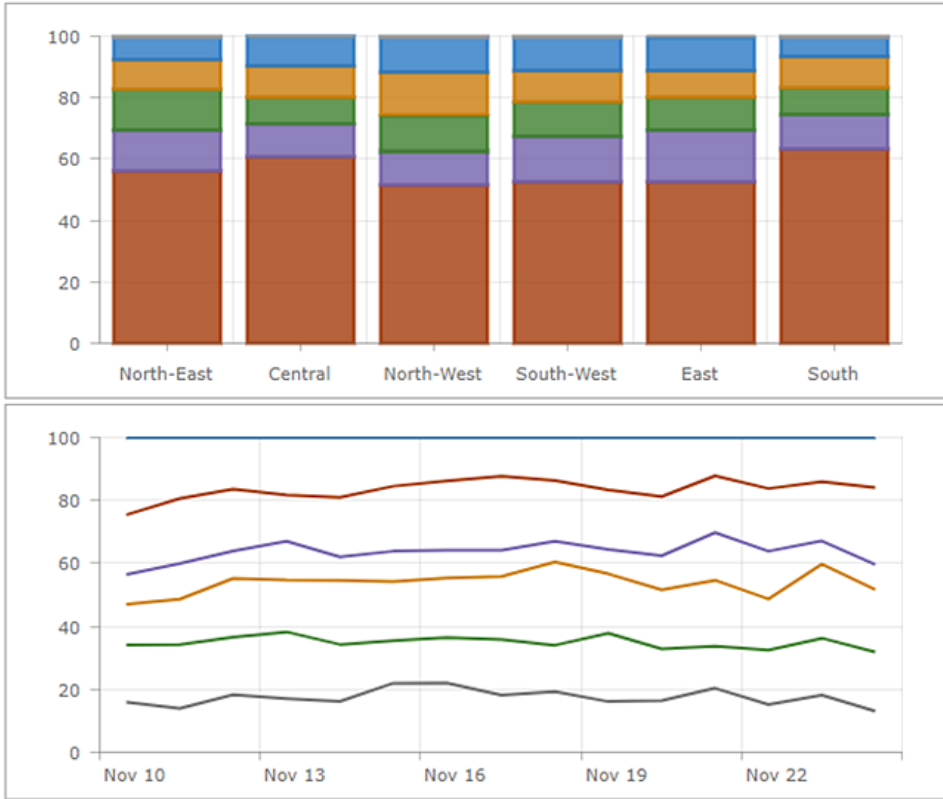
Stacking allows series to be placed on top of each other without overlapping. A stacked chart is similar to a grouped chart in that it can be used to display information about subgroups that comprise different categories. In a stacked chart, the data points representing subgroups are placed on top of each other (or side by side when the

chart is displayed horizontally). Different colors are used to indicate the contributions of the different subgroups. The overall value is the total size of the category.



100% stacked charts

A variation of a stacked chart is a 100% stacked chart. This shows relative differences within each category. The total of each column is always 100 percent, and the length of each subgroup is its contribution to the total in terms of percent.

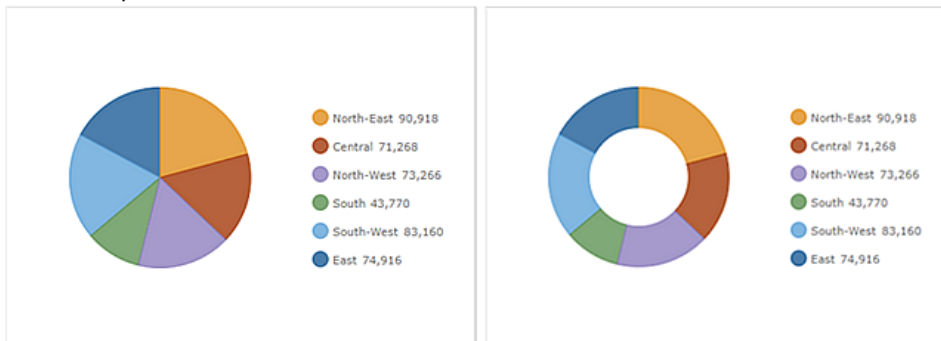


Pie chart

A pie chart is a circular chart divided into sections. Each section is proportional to the quantity it represents. A pie chart contains a single [series](#) of data points.

Use pie charts to show part-to-whole relationships or for data composition. Pie charts are not intended for comparing individual sections with each other or representing exact values (use a [serial chart](#) for that). Pie charts are also not meant to show more than seven or eight data points.

A donut chart is an alternative representation of a pie chart. It can be thought of as a column in a stacked bar graph in a circular shape. Donut charts are created by increasing the value for the **Inner Radius (%)** setting on the **Chart** tab of the pie chart element.



In an interactive dashboard, a pie chart can be the source or target of an action. When used as the source of an action, the chart can be configured for single or multiple selection mode. This determines the number of data points that can be selected at a time. When a chart is the source of an action, it can, for example, trigger a map to pan or zoom, or filter another dashboard element (see [Charts as the source of actions](#)). Conversely, when a chart is the target of an action such as a map extent change, the chart can be filtered so the data it displays corresponds with the map's new extent.

Indicator

An indicator is essentially a card that can be added to your dashboard. It can be used to show the numeric attributes of individual features, or it can be used to display a count, a sum, an average, a minimum, or a maximum summary statistic. Additionally, it can be configured to compare its computed value to a reference value. Last, it can be configured to show an icon or change its color only in response to conditional thresholds being met. The following are some examples of the many configurations possible with an indicator:



As with many dashboard elements, the indicator has a title area, an area for the visualization, and a description area (for more information, see [Configure an element](#)). On an indicator, the area for the visualization can be divided into three areas: top, middle, and bottom. Each area is optional and can display text. This text can be any combination of the indicator's value, its reference value (if specified), a predefined list of calculations, or hard-coded text. As the indicator is resized, the text displayed in the top, middle, and bottom areas scales to fit the size of the indicator.

The predefined calculations available for an indicator are shown in the following table. They can be inserted into the top, middle, or bottom text fields by clicking **Fields** {}.

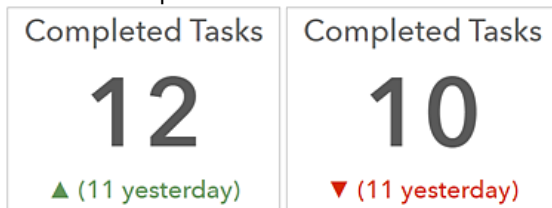
Description	Formula
Calculated value	Value
Reference value	Reference
Difference	Value - Reference
Absolute difference	Value - Reference
Percentage	100 * Value / Reference
Percent change	100 * (Value - Reference) / Reference

Description	Formula
Ratio	Value / Reference
Ratio change	(Value - Reference) / Reference

When specifying top, middle, or bottom text, HTML codes can be used. If you can't find a desired symbol on your keyboard, you can copy and paste it from another website directly into the text settings, or you can enter the symbol's decimal (dec) or hexadecimal (hex) reference code in these settings. For example, to include an upward pointing triangle (▲) in the indicator, you can insert its dec code of `▲` or its hex code of `▲` into the text settings. See [Effective use of HTML](#) for details.

The middle text is unique because it can have an icon displayed to the left or right of the text. These icons are scalable vector graphics (SVG) and, as with the text, will resize as the indicator resizes. If the provided SVG icons are insufficient, you can use your own. For more information, see [Use custom icons](#).

Reference values on indicators are optional and, when specified, can be thought of as a predefined goal or threshold. There are three types of reference values: the indicator's previous value, a fixed value set at design time, or a statistic calculated at run time. If you set a reference value, you can also configure conditional formatting for the indicator. Conditional formatting enables an indicator to display differently based on whether the current value is at or above the reference value or below it. In the following example, a red or green triangle is used to indicate whether completed tasks have increased or decreased, respectively, from the previous day's totals.



You can also apply techniques such as [value conversion](#), [unit prefixing](#), and [number formatting](#) to the indicator. Finally, indicators can be used in interactive dashboards as the target of an [action](#). This means that an action performed on another element, such as a selection on a list or a category selector, can control the data available to be displayed on the indicator.

Gauge

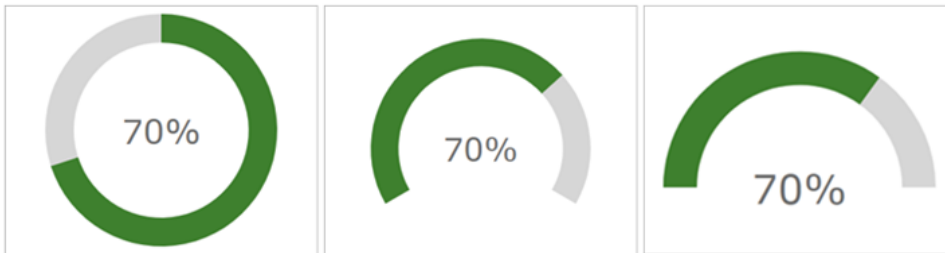
Gauges are used to display a single metric within a quantitative context defined by minimum and maximum values. The metric can be derived from one of a feature's numeric fields or from a summary statistic. These quantitative context values can either be fixed or dynamic and based on feature values or summary statistics with or without applied [filters](#). As with an [indicator](#), a gauge shows the state of only one metric or value—unlike, for example, a [pie chart](#), which can show the state of two or more values.

Gauges inform viewers of current situations rather than past or general trends. To show the latter, a gauge can be [grouped](#) with another element better suited to show values over time, such as a [line chart](#). Gauges are also effective in interactive dashboards as the target of an [action](#). When this occurs, actions performed on other elements, such as a selection on a list, can control the data available to be displayed on the gauge.

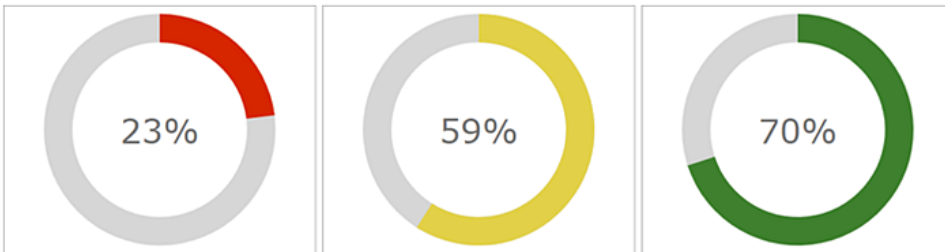
When configuring a gauge, you can choose from two styles: [progress](#) and [meter](#).

Progress gauge

Progress gauges convey whether a value is moving forward within a quantitative context defined by minimum and maximum values. This value is represented by a colored band and shown in the center of the gauge as either a raw number or a percentage. Progress gauges can be displayed in one of three shapes: circle, horseshoe, or half circle.



You can define thresholds in terms of percentages in progress gauges as well. Thresholds are used to change the color of the band as the value progresses. In the following example, thresholds have been defined so that the band appears red, yellow, or green, depending on the current value:



Meter gauge


As with progress gauges, meter gauges have a quantitative context defined by minimum and maximum values. However, they are better suited to show the amount, level, or contents of something, rather than illustrate whether a value is progressing. Also, the position of the meter gauge's needle indicates the current value rather than a band, and the value can only be presented as a raw number in the center of the meter gauge. Another difference is that meter gauges can only be displayed as a horseshoe or half circle.

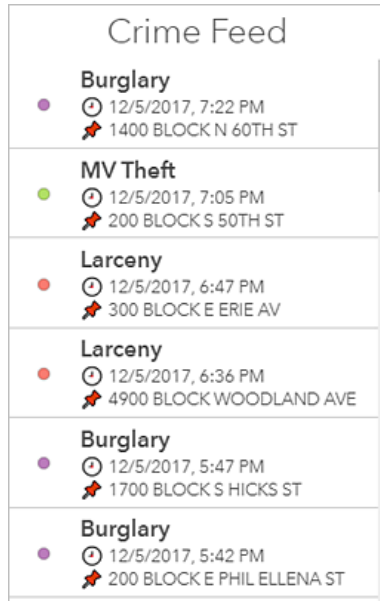


You can define interval ranges, in terms of raw numbers or percentages, to create qualitative ranges in meter gauges. These ranges can indicate a state such as good, average, or poor. You can also configure the gauge with a comparative measure, which facilitates comparisons to a predefined key performance indicator (KPI) or goal.

List

A list is used to show features or rows from a layer. When available, field formatting information in a list is based on information found in the layer's pop-up. However, as with all data-driven elements, you can [create filters](#) for lists to limit the amount of information they display. You can also limit the number of features displayed in a list at once. Additionally, you can specify the order in which the features are sorted in the list. For example, you can configure the list so that rows with certain attributes for a date-based field appear near the top, which is particularly important in real-time scenarios.

You can also adjust how the information is displayed in a list by using the rich text editor when configuring it. Furthermore, since lists show layer rows or features, you can insert field values directly into the displayed text. To do this, click **Insert**  and choose your desired field. At run time, the field values will be interpreted and displayed. See [Effective Use of HTML](#) for details.



Tip:

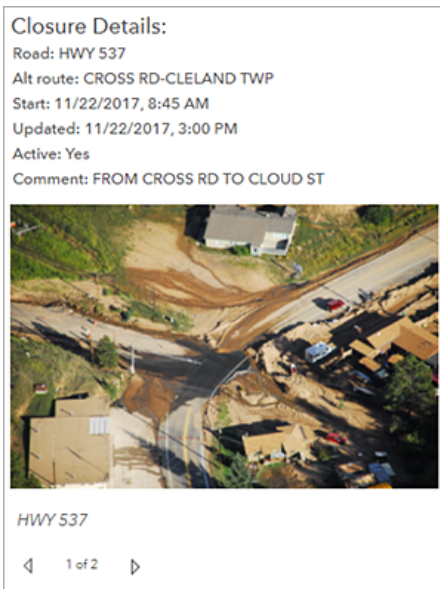
If you do not like how dates or numbers are displayed, you can change the configuration of the layer's pop-up in Map Viewer Classic. Your updates will be reflected in the list. See [Configure pop-ups](#) for details.

A list can also be configured to have a single row or multiple row selection mode. Which selection mode to choose is an important consideration when you are building an interactive dashboard in which a list can be either the source or target of an [action](#). When a list is the source of an action, it can, for example, trigger a map to pan or zoom. Conversely, when a list is the target of an action such as a map extent change, the list can filter so the data it displays corresponds with the map's new extent.

Details

The details element is used to show information about features or rows from a layer. Its display is based on a layer's pop-up information. Each pop-up has four distinct parts: title, content, media, and attachments (see [Configure pop-ups](#) for details). When configuring the details element, each of these parts can be switched on or off.

As with all data-driven elements, you can [create filters](#) for the details element to limit the amount of information it displays. Also, as with the [list element](#), you can limit the number of features displayed in the details element and sort the order in which features are presented. The latter means that you can, for example, specify that rows with important values for a date-based field appear at the front of the element's carousel. This is particularly important in real-time scenarios.



The details element is especially effective in interactive dashboards as the target of [actions](#). An example of this would be if a selection on a list or a change in a map's extent controlled the data available to be displayed in the details element.

Rich text

You can use rich text elements in a dashboard to provide additional context. You can include anything from small amounts of fixed text to larger amounts of instructions, notes, contact information, or website links.

Rich text is created using a what-you-see-is-what-you-get (WYSIWYG) HTML editor. To include advanced content, enter text directly into the HTML source. See [Effective use of HTML](#) for details.

This dashboard shows locations of crimes, medical emergencies, traffic accidents, and locations of emergency response vehicles in real-time in Redlands, CA. For more information about dashboards, visit <http://doc.arcgis.com/en/operations-dashboard/>.

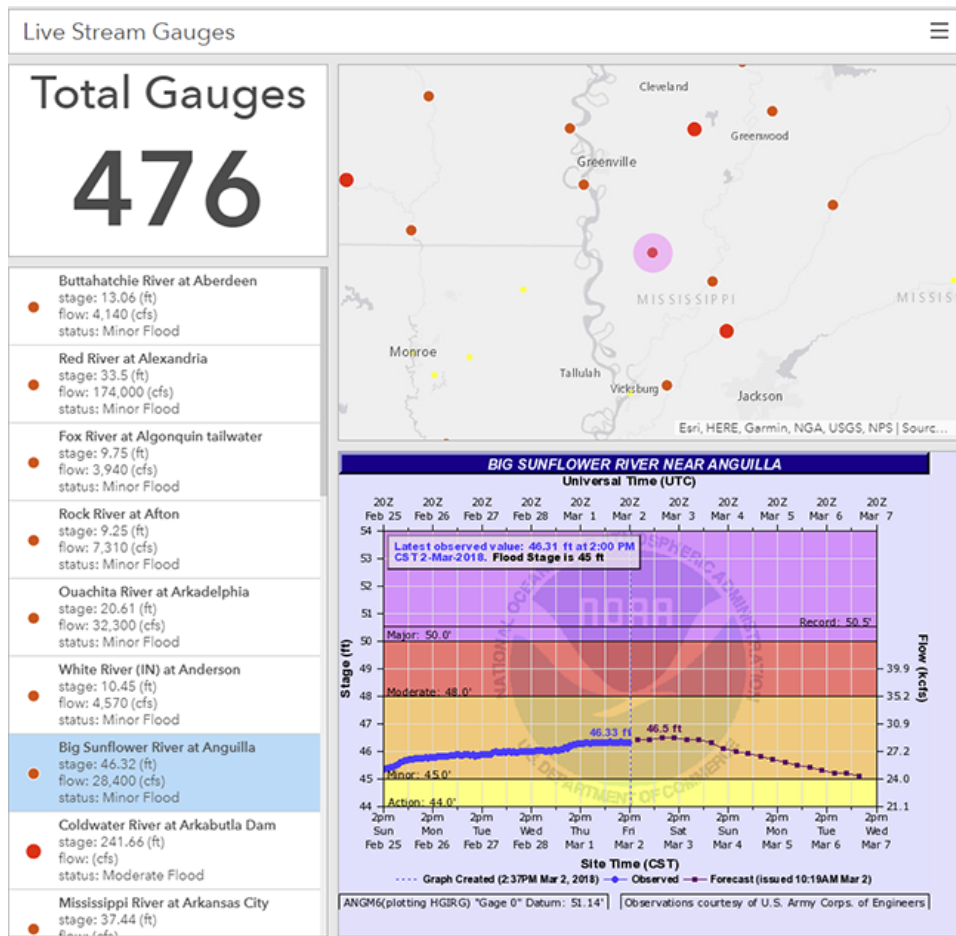


The following are tips for using URLs in the rich text element:

- URL references should use HTTPS. If an HTTPS connection is not possible, consider using a relative URL, which doesn't specify HTTPS or HTTP. For example, use `//www.example.com/logo.png`.
- If the URL references a domain that differs from your organization, the server hosting the requested resources should support CORS requests from your organization.

Embedded content

The embedded content element makes it easy to embed documents, images, video, or other web content into your dashboard. Two configuration options are available. When you configure the element to be static, all you need is the URL of the content to be embedded. When you configure it by features, the element is data driven and you need to identify a [data source](#). This means that each feature's attribute information can be used to dynamically construct a URL at run time. When configured by features, the embedded element can be the target of an [action](#). Specifically, it can be the target of elements that support a selection change event.



Note:

- Always know the source of the content you are embedding, and ensure that you respect any terms of use.
- Some websites restrict embedding. This is a choice that some organizations make to protect their content from misuse by third-party users. If this is the case, you can link to the content using [HTML](#).

The following tips are useful for using URLs in the embedded content element:

- URL references should use HTTPS. If an HTTPS connection is not possible, consider using a relative URL, which doesn't specify HTTPS or HTTP. For example, use `//www.example.com/content.html`.
- If the URL references a domain that differs from your organization, the server hosting the requested resources should support CORS requests from your organization.

 **Note:**

If you're having trouble embedding content and are familiar with your browser's development tools, you can troubleshoot by monitoring the network traffic. You may see error messages for mixed content or embed restrictions. In the latter case, look for a property named X-Frame-Options in the response header.

Include data

Understand data sources

Dashboards contain elements such as maps, charts, lists, gauges, panels, and selectors. Many of these elements are data-driven. In ArcGIS, you work with data through **layers**. Layers, also called web layers, are logical collections of data that can be used to create **web maps** and web scenes.

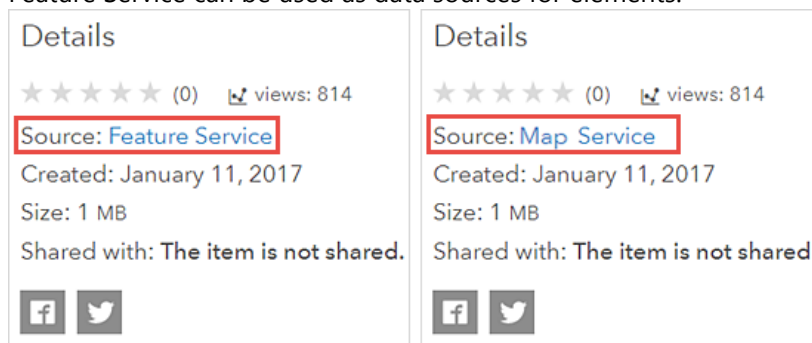
Layers are stored as content items in your **organization's portal**. You can **browse and search** for them. Dashboards works with web layers and operational layers in web maps. Operational layers are those you can interact with in a web map and that are drawn on top of basemap layers. See the **How layers are used** section in the Layers topic for details.

Note:

Support for layers in web scenes will be added in a future release.

Data sources and layer types

In general, there are two data types that can be referenced by a layer: feature and imagery. The data used when displaying a layer comes from various sources. Some data sources are file based, such as CSV and XLS files, or open standards based, such as KML and OGC. Other data sources are native to ArcGIS, such as hosted services and ArcGIS Server services. A dashboard's elements work with feature-based layers that are backed by these services. In particular, dashboard elements work with map service layers and feature service layers. To determine whether a web layer is backed by one of these services, check its **item details**. Layer items that have a source of Map Service or Feature Service can be used as data sources for elements.



All data-driven elements (except **map**), such as **list**, **serial chart**, **pie chart**, and **indicator**, are based on these layers. The data source for the map element is a web map, which can contain various **types of web layers**. The following are examples of data sources that can be used in a dashboard map but not in other dashboard elements:

- **Tile layers**
- **Shapefiles**
- **Feature collections** (including map notes)
- **GeoRSS**
- **CSV, TXT, and GPX files**
- **KML**
- **OGC**
- **Streaming feature layers**

- [Cached map services](#)

Once a web map has been added to a dashboard through adding a map element, all of its operational layers that are based on native ArcGIS map and feature services can be used to supply data to other elements in the dashboard. See [Create web maps for dashboards](#) for best practices on authoring web maps to use in Dashboards.

 **Caution:**

Once other elements use a web map's operational layers, deleting a map element from the dashboard produces a warning that dependent elements will also be deleted.

Layer capabilities

When a layer is backed by a map or feature service, it can be used in a dashboard. That is, you will be able to select it when browsing for data when configuring dashboard elements. However, not all candidate layers have equal capabilities.

 **Note:**

Layers that are not candidates will appear while browsing for data in the **Select a layer** screen, but they will be gray and unavailable so you can't select them.

When selecting a layer to be used in a dashboard, a check is made to ensure that its underlying service can be queried. This is so design-time and dynamic runtime [filters](#) can be applied. Failure to pass this test results in a message that the layer does not meet the necessary criteria to use it in a visual element, and an **OK** button is enabled so you can choose another layer from the **Select a layer** screen.

When configuring an element, additional capability checks can be made, including the following:

- Does the layer support querying using aggregate functions (for example, COUNT, MAX, MIN, SUM, and AVG) to group the result set by one or more columns?
- Does the layer support querying so that the result set can be displayed in ascending or descending order?
- Does the layer support statistics?
- Does the layer have map and data capabilities?

If some of these capabilities are not met, you may experience differences in the dashboard authoring experience. For instance, if the layer meets the necessary query capabilities but not the other capabilities listed above, a warning appears in the **Select a layer** screen.

Different layers have different capabilities for various reasons, such as the ArcGIS Server version used to create the layer. For more information about candidate services and layers, see the following resources:

- [Map Service](#)
- [Map Service Layer](#)
- [Feature Service](#)
- [Feature Service Layer](#)

Layer filters

Any filters applied to a web map's operational layer or web layer are respected in a dashboard. You can [create design-time or runtime filters](#) that can be applied in addition to any predefined filter conditions that may already exist.

Field names and aliases

Field names are those given to the columns in a layer and indicate which data the column contains. Field aliases allow for an alternate name for a field. Whenever a field has an alias defined, dashboards will show that alias when you are viewing a field, such as when choosing a field for a filter condition, or choosing a field to sort features by in the details or list elements. When an alias is not available, the field name is used.

Data series

A data series is a set of data that is displayed on a chart. For example, a [pie chart](#) or [serial chart](#) showing lines, columns, bars, or areas relies on a series of data to render its display. With a serial chart, more than one series can be displayed at a time.

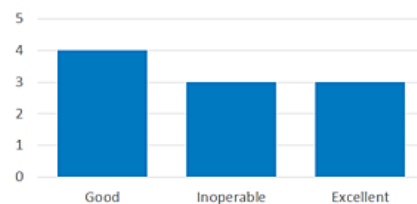
You can think of a series as an array of name-value pairs. Each instance of a name-value pair in the array is a data point. When plotted on a chart, each data point has a shape. For example, on a pie chart, the shape of each data point is a circular selector (slice). On a serial chart with columns, each data point is a vertical rectangle.

The [data sources](#) for dashboard elements are layers, and each layer has one or more columns of attributes. To plot a chart, a series from the layer's underlying data must be created. You have three options for this: [Grouped Values](#), [Features](#), and [Fields](#).

Grouped Values

The Grouped Values option relies on data aggregation to create a series. From the raw data, each data point in the series represents a summary statistic (count, sum, average, minimum, maximum, or standard deviation) grouped into categories using a field's unique values in the input layer. For all summary statistics except count, a field from which to gather the summary statistic must also be provided. In the following example, the Condition field is used to group the raw data into categories. The count of each unique condition is then calculated and plotted on the chart.

ID	Condition	Corroded	Pressure (PSI)
1	Good	True	42
2	Inoperable	True	52
3	Good	True	37
4	Excellent	False	55
5	Excellent	False	60
6	Good	True	39
7	Good	False	40
8	Inoperable	True	53
9	Inoperable	False	50
10	Excellent	True	49



Split by

When grouping values into categories on a serial chart, you can specify a split-by field. In this scenario, the input data is split into multiple data series (that is, one series for each unique value in the split-by field). Using the same data as the previous example, you can produce a chart like the one below by categorizing the data based on the values in the Condition field and then splitting it into multiple series based on the Corroded field.

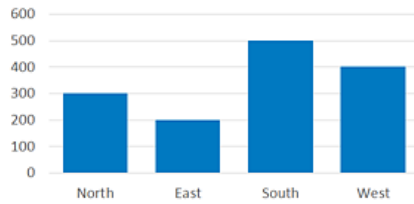
ID	Condition	Corroded	Pressure (PSI)
1	Good	True	42
2	Inoperable	True	52
3	Good	True	37
4	Excellent	False	55
5	Excellent	False	60
6	Good	True	39
7	Good	False	40
8	Inoperable	True	53
9	Inoperable	False	50
10	Excellent	True	49



Features

This is the simplest option and causes the chart to draw the fastest. Each feature or row of data represents a data point in the series. It is not necessary to calculate a summary statistic. One field is identified as the category or name field, while another is identified as containing the value to plot. In the following example, the Region field represents the categories, and the Incidents field represents the value to plot.

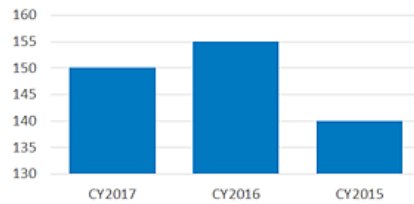
ID	Region	Incidents
1	North	300
2	East	200
3	South	500
4	West	400



Fields

In this scenario, one or more numeric field names are specified to represent the categories. For each field or category, a summary statistic is calculated to create a data point. In the following example, the CY2017, CY2016, and CY2015 fields represent the categories. The sum of all rows is plotted on the chart.


ID	Region	CY2017	CY2016	CY2015
1	North	35	35	30
2	East	20	25	15
3	South	55	60	55
4	West	40	35	40



Field types and coded strings

When configuring a dashboard, you are often presented with a list of fields from which to choose. In certain cases, such as when you are [creating filters](#), it is important to consider the type of field you are choosing and whether the field contains coded strings. This is because Dashboards will use this information to adjust the options that are subsequently presented to make the configuration experience more streamlined. For instance, when configuring a filter, the field type you choose determines the operators that display, which in turn impacts the values you can include in your filter condition.

The following table describes the available field types:

Dashboard field type	ArcGIS field type or coded string	Description
unique	esriFieldTypeOID	A field type that guarantees a unique ID for each row of data.
string	esriFieldTypeString	A text field type that represents a series of alphanumeric symbols.
number	esriFieldTypeInteger, esriFieldTypeSmallInteger	A field type for numeric values without fractional values within a specific range.
decimal	esriFieldTypeSingle, esriFieldTypeDouble	A field type for numeric values with fractional values within a specific range.
date	esriFieldTypeDate	A field type that can store dates, times, or dates and times.
coded string	typeField	<p>A field type identified at publishing as containing features that are logically grouped based on a unique characteristic or behavior of the data.</p> <p> Note: The values stored in coded string fields often have attribute domains applied. Attribute domains are used to restrict the values found in the field and can be coded values (that is, a predefined set of allowed values) or a numeric range. Coded value domains can be applied to any field type, whereas range domains can be applied to any numeric or date data type.</p>

Filter data

Creating filters is an essential part of building a focused and effective dashboard. Filters enable you to specify one or more search conditions to limit the features from the source layers that are used to power your dashboard's data visualizations. Only layer features that meet the search conditions you define are used to render the dashboard's elements.

Filters can be applied at design time, when you're configuring the dashboard, or at run time when you're [configuring selectors](#) as part of an interactive dashboard experience.

Note that any filter conditions that have been applied to a web map's operational layer or to a web layer item that are used in a dashboard are respected. All filter conditions that you configure in the dashboard are implemented in addition to any predefined filter conditions that have already been created.

Filter condition components

In general, a filter condition is composed of a field name, an operator, and a value or values. These are specified in the first, second, and if applicable, third settings that appear when creating a filter, respectively.

`condition = <field name> <operator > <a value or values>`

Operators can be broken down into the following categories based on their general purposes:

- Comparison
- Fixed comparison
- Relative comparison
- List
- Null or empty value
- Pattern match
- Range

When configuring a filter, the available operators are determined by the [type of field](#) you choose and whether the field contains coded strings. The following table lists the available operators based on these factors:

Operator purpose	Field type and coded string
Comparison	
equal	unique, number, decimal, string, coded string
not equal	unique, number, decimal, string, coded string
greater than	unique, number, decimal
greater than or equal	unique, number, decimal
less than	unique, number, decimal
less than or equal	unique, number, decimal
Fixed comparison	
is	date
is not	date

Operator purpose	Field type and coded string
is before	date
is or is before	date
is after	date
is or is after	date
Relative comparison	
is within the last	date
is before the last	date
is within the next	date
is after the next	date
List	
include	unique, number, string, coded string
does not include	unique, number, string, coded string
Null or empty	
is null	number, decimal, date, string, coded string
is not null	number, decimal, date, string, coded string
is empty	string
is not empty	string
Pattern match	
starts with	string
does not start with	string
ends with	string
does not end with	string
contains	string
does not contain	string
Range	
between	unique, number, decimal
not between	unique, number, decimal

For additional details about fixed and relative comparison operators, see [Date-based filter conditions](#).

 **Note:**

To filter features effectively, the layer must support [standardized SQL functions](#).

The last step of configuring a filter condition is specifying the value or values. Which values you can define and how to define them depend on the purpose of the operator you chose as summarized in the following table:

Operator purpose	Options for specifying value
Comparison	Choose a specific value or another field.
Fixed comparison	Choose a time period, enter a specific value, or choose a field.
Relative date comparison	Enter a date unit multiplier and specify date units.
List	Enter one or multiple values.
Null or empty	N/A
Pattern match	Enter a value to match against.
Range	Enter a lower bound value and upper bound value.

Combine filter conditions

Filter conditions can be combined to create complex expressions. There is no limit to the number of conditions you can include in your filter. When combining conditions, two logical operators are offered: **AND** and **OR**. For instance, you can make the following expression:

```
expression = condition1 AND condition2 OR condition3
```

If you click **AND**, the element displays information about features that satisfy both conditions simultaneously. For instance, if you want an [indicator](#) to display information about emergency incidents that occurred on a certain date (condition1) and have not been responded to yet (condition2), join the two conditions by clicking **AND**.

If you click **OR**, the element displays information about features that satisfy one condition, the other condition, or both conditions simultaneously. For example, if you want an indicator to display information about emergency incidents that occurred on two specific dates, combine the two conditions for each date by clicking **OR**.

Note that for unique, number, string, and coded string field types, you can avoid combining conditions using the operators `include` or `does not include`, which enable you to enter multiple unique values.

Date-based filter conditions

Dates are composed of two parts: date and time. In general, when [configuring a filter condition](#) with a date field type, there are two types of conditions you can create: [fixed date](#) and [relative date](#).

Note:

To filter features by date, the layer must [support standardized SQL functions](#).

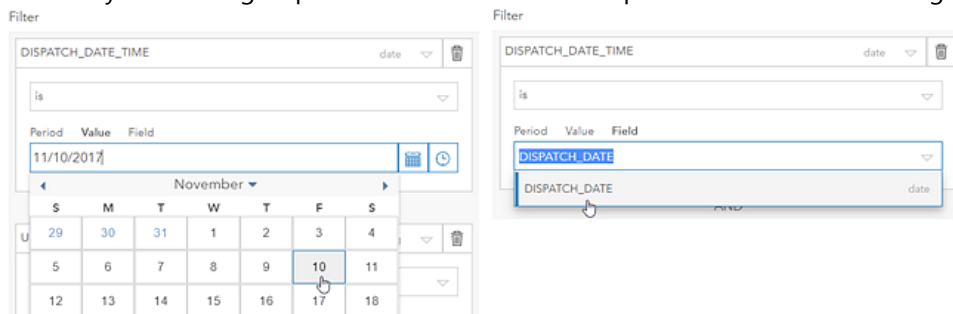
When filtering dates, enter the time component in your local time zone. Behind the scenes, the dashboard searches the target layer's properties for time zone information. If time zone information is found, queries are sent in that time zone. This may involve converting the input values to the target layer's time zone. If time zone information is not found, the dashboard converts the input values to coordinated universal time (UTC) before they are sent.

Tip:

- Dates in [hosted feature layers](#) are always stored in UTC. If you specify a source time zone when [publishing](#) a hosted feature layer, date values are converted to UTC during the hosting process.
- [ArcGIS Pro](#) and [ArcMap 10.4](#), and later allow time zone information to be set when publishing a service that references data stored in a [registered enterprise database or geodatabase](#).

Fixed-date conditions

Fixed-date filter conditions include a specific date value. You can enter this value can by choosing a date from the date picker on the **Value** tab or by choosing another date field on the **Field** tab. Choosing a date field works in the same way as entering a specific date value that can update based on data changes to the field.



Note:

The **Field** tab only appears if the element's layer includes more than one date field.

A fixed-date filter condition can only be created with the following [operators](#):

- is
- is not
- is before
- is or is before
- is after
- is or is after

Note:

You can also create a fixed-date filter condition with a range of fixed dates by creating individual filters with fixed dates and [combining them](#) using logical operators.

Relative-date conditions

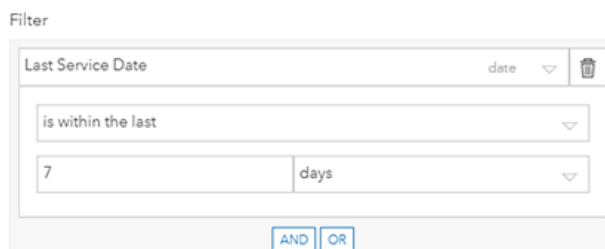
Relative-date filter conditions include a range of date values. The range can be anchored to or include the current moment in time (now), or it can be a predefined period (for example, last week). The range or anchor type you can enter depends on the operator you choose.

Operator	Anchor type
is within the last	Now
is before the last	Now
is within the next	Now
is after the next	Now
is	Now or predefined
is not	Now or predefined
is before	Now or predefined
is or is before	Predefined
is after	Now or predefined
is or is after	Predefined

Anchored to now

The benefit of using date ranges anchored to now is that they allow elements to refresh at the rate that data might be changing. For example, an [indicator](#) configured to display data that is within the last 30 minutes can potentially show different data every minute if its layer also refreshes that often. However, an indicator that shows data from yesterday will only show different data after today's date has changed (that is, after midnight) regardless of the layer's refresh interval.

When selecting an operator associated with an anchor type of now, you are prompted to specify a unit multiplier (N) as well as a time unit (for example, day, hour, minute, or second). For instance, if the date range is 7 days, the unit multiplier is 7 and the time unit is day.



The following table describes date ranges anchored to now. Note that all date values are in your local time zone.

Operator	Time unit	Description
is within the last	seconds	N seconds before now.
	minutes	N minutes before now.
	hours	N hours before now.
	days	Starts at 12:00:00 a.m. N days before the current day up to now.
is before the last	seconds	N seconds before now and continues indefinitely.
	minutes	N minutes before now and continues indefinitely.
	hours	N hours before now and continues indefinitely.
	days	Starts at 12:00:00 a.m. N days before the current day and continues indefinitely.
is within the next	seconds	Starts now and continues N seconds from now.
	minutes	Starts now and continues N minutes from now.
	hours	Starts now and continues N hours from now.
	days	Starts now and continues until 11:59:59 p.m. N days from now.
is after the next	seconds	N seconds after now continues indefinitely.
	minutes	N minutes after now and continues indefinitely.
	hours	N hours now and continues indefinitely.
	days	Starts at 12:00:00 a.m. N days after the current day and continues indefinitely.
is before	Now	Includes everything up to now.
is after	Now	Includes everything from now.
is	Year to date	Starts at 12:00:00 a.m. January 1 of the current year and continues to now.
is not	Year to date	Excludes everything in the current year to date. The current year to date starts at 12:00:00 a.m. January 1 of the current year and continues to now.

Anchored to a predefined period

Using date ranges anchored to a predefined period is appropriate when you don't need the data to update as frequently as the layer refreshes.

When selecting an operator associated with a predefined anchor type, you need to specify an interval on the **Period** tab.

Filter

The screenshot shows a filter configuration window for the field 'Last Service Date'. The field type is 'date'. The operator is set to 'is'. Below the operator, there are two tabs: 'Value' and 'Field'. The 'Field' tab is selected, and the interval is set to 'This week'. At the bottom of the window, there are buttons for 'AND' and 'OR' to combine filters.

These periods are based on the following units. Note that start and end times are always based on your local time zone.

- **Day**—A day starts at 12:00:00 a.m. and continues for 24 hours, ending at 11:59:59 p.m. On a 24-hour clock, a day starts at 00:00:00 and continues for 24 hours, ending at 23:59:59.
- **Week**—A week starts at 12:00:00 a.m. on the first day of the week and continues for seven consecutive days, ending at 11:59:59 p.m. on the seventh day.

 **Note:**

The first day of the week is determined by the calendar on your device. For example, a week may be Sunday to Saturday or Monday to Sunday.

- **Month**—A month is defined according to the Gregorian calendar. Each month starts at 12:00:00 a.m. (local time) on the first day of the month and continues until 11:59:59 p.m. (local time) on the last day of the month.
- **Quarter**—Each year is divided into quarters that are three months long, as described below.
 - **1st quarter**—January through March
 - **2nd quarter**—April through June
 - **3rd quarter**—July through September
 - **4th quarter**—October through December
- **Year**—A year is the 12-month time period beginning at 12:00:00 a.m. on January 1 and ending at 11:59:59 p.m. on December 31.

Predefined time period	Description
Today	Starts at 12:00:00 a.m. on the current day and continues for 24 hours.
Yesterday	Starts at 12:00:00 a.m. on the day before the current day and continues for 24 hours.
Tomorrow	Starts at 12:00:00 a.m. on the day after the current day and continues for 24 hours.
This week	Starts at 12:00:00 a.m. on the first day of the current week and continues for seven days.
Last week	The 7-day period that ends immediately before the current week starts. Last week starts at 12:00:00 a.m. on the first day of the week that precedes the current week and continues for 7 days.
Next week	The 7-day period that starts immediately after the current week ends. Next week starts at 12:00:00 a.m. the first day of the week after the current week and continues for 7 days.
This month	Starts at 12:00:00 a.m. on the first day of the current month and continues until 11:59:59 p.m. on the last day of the month.
Last month	Starts at 12:00:00 a.m. on the first day of the month that precedes the current month and continues until 11:59:59 p.m. on the last day of the month.
Next month	Starts at 12:00:00 a.m. on the first day of the month that follows the current month and continues until 11:59:59 p.m. on the last day of the month.
This quarter	Starts at 12:00:00 a.m. on the first day of the current quarter and continues for three months, ending at 11:59:59 p.m. on the last day of the quarter.
Last quarter	Starts at 12:00:00 a.m. on the first day of the quarter immediately preceding the current quarter and continues for three months, ending at 11:59:59 p.m. on the last day of the quarter.

Predefined time period	Description
Next quarter	Starts at 12:00:00 a.m. on the first day of the quarter after the current quarter ends, and continues for three months, ending at 11:59:59 p.m. on the last day of that quarter.
This year	Starts at 12:00:00 a.m. January 1 of the current year and continues for 12 months (through 11:59:59 p.m. on December 31).
Last year	Starts at 12:00:00 a.m. January 1 of the year immediately preceding the current year and continues for 12 months (through 11:59:59 p.m. on December 31).
Next year	Starts at 12:00:00 a.m. January 1 of the year immediately following the current year and continues for 12 months (through 11:59:59 p.m. on December 31).

Format Data

Format dates

Date patterns can be used to control the way dates are displayed throughout a dashboard, such as on the category axis of a [serial chart](#). A date pattern is a string of characters in which specific character strings are replaced with date and time data from a calendar.

In a date pattern, the number of instances you enter the same character in the **Pattern** setting may produce different date displays. Using the character "y", which symbolizes "year" as an example, entering yy produces 99, whereas entering yyyy produces 1999. Often, the number of characters in a pattern also specifies its width. Using the character "h", which represents "hour" as an example, entering h in the **Pattern** setting produces 5, whereas entering hh produces 05. In other cases, the character count specifies whether abbreviated or full date information will display.

You can create date patterns with the characters described in the following table:

Character	Description
y	Year. The number of y letters represent digits of the year in the resulting date. For example: <ul style="list-style-type: none"> yy = 05 (always two digits) yyyy = 2005
M	Month of the year. The output depends on the number of M letters you enter. For example: <ul style="list-style-type: none"> M = 8 (one or two digits) MM = 08 (always two digits) MMM = Aug (three-letter month abbreviation) MMMM = August (full name of the month)
w	Week of the year.
d	Day of the month. For example: <ul style="list-style-type: none"> d = 7 (one or two digits) dd = 07 (always two digits)
E	Day of the week. For example: <ul style="list-style-type: none"> E = 2 (single-digit for a week day) EE = 02 (two-digit representation for a week day) EEE = Tue (three-letter day of the week abbreviation) EEEE = Tuesday (full name of the day)
a	Produces either am or pm.

Character	Description
H	Hour: 0-23. For example: <ul style="list-style-type: none"> • H = 3 (one or two digits) • HH = 03 (always two digits)
k	Hour: 1-24. For example: <ul style="list-style-type: none"> • k = 3 (one or two digits) • kk = 03 (always two digits)
K	Hour in am or pm: 0-11
h	Hour in am or pm: 1-12
m	Minute in an hour. For example: <ul style="list-style-type: none"> • m = 8 (one or two digits) • mm = 08 (always two digits)
s	Second in a minute. For example: <ul style="list-style-type: none"> • s = 5 (one or two digits) • ss = 05 (always two digits)
Other special characters	Other special characters will be displayed as they are entered in the Pattern setting. For example, yyyy-MM-dd will produce 2013-03-01.

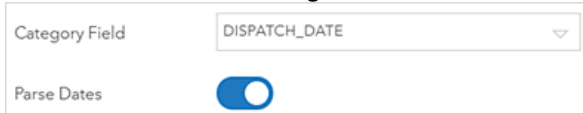
The following are example date patterns:

Pattern	Result
M/d/yy	10/1/17
MMMM d, yyyy	October 1, 2017
d MMM yy	1 Oct 17
EEEE, MMMM d, yyyy	Sunday, October 1, 2017
yyyy	2017
HH:mm:ss	00:00:00
kk:mm:ss	24:00:00
KK:mm:ss a	11:00:00 am
hh:mm:ss a	12:00:00 pm
hh:mm:ss	12:00:00

Parse dates

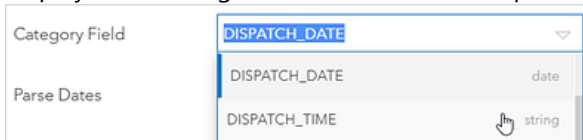
When visualizing time-series data on a [serial chart](#), you must choose the field that contains the time stamps for your **Category Field**. These time stamps can be stored in fields of date, string, or numeric type. For best performance, it is recommended that you store your time stamps in a date field type. You can convert string or numeric fields containing time stamps to date fields using the [Convert Time Field](#) tool.

If you don't want to convert your string or numeric fields into date fields, you can indicate that these fields contain date values and allow Dashboards to parse the time stamps into dates by enabling **Parse Dates**. This setting is located on the **Data** configuration tab under **Category Field**.



Which date settings appear under the **Parse Dates** setting when it is enabled depend on the type of field you chose for **Category Field**.

If the data type of the field is date, no formatting information is required, and you will see only the **Minimum Period** setting. If you choose a numeric or string field, you will see this setting and the **Parsing Pattern** setting. The pattern you choose for this setting determines how Dashboards will format your time stamps after parsing them into dates. Also, the time stamps in your data must be stored in the same format you choose for the **Parsing Pattern** setting. The available patterns depend on whether the field type is numeric or string. You can see whether you chose a date, string, or numeric field for **Category Field** in that setting's drop-down menu. Each field's type is displayed to the right of the field in the drop-down menu.



If the field type is numeric (for example, Short, Long, Float, or Double), the following standard numeric time formats are provided in the **Parsing Pattern** drop-down menu:

- yyyy
- yyyyMM
- yyyyMMdd
- yyyyMMddHHmmss

If the field type is string, the following standard string time formats are provided in the **Parsing Pattern** drop-down menu:

- yyyy
- yyyyMM
- yyyy/MM
- yyyy-MM
- yyyyMMdd
- yyyy/MM/dd
- yyyy-MM-dd
- yyyyMMddHHmmss

- yyyy/MM/dd HH:mm:ss
- yyyy-MM-dd HH:mm:ss
- yyyyMMddHHmmss.S
- yyyy/MM/dd HH:mm:ss.S
- yyyy-MM-dd HH:mm:ss.S
- yyyy-MM-ddTHH:mm:ss.S

 **Tip:**

For temporal data with sub-second granularity, you can choose to store your time stamps in one of the last four formats listed above. Using one of these formats, you can store time values that represent 1/1,000th of a second (1 millisecond), 1/100th of a second, or 1/10th of a second. For example, if you want to visualize data every millisecond, you can store the time value as 200911231030.560. In this case, the data will draw at the 560th millisecond for the time 200911231030 when visualizing it with the time slider.

The **Minimum Period** setting determines how time specific the chart categories can be. The options for **Minimum Period** are as follows:

- Second
- Minute
- Hour
- Day
- Month
- Year

For instance, in the following chart, the minimum period is set to **Month**. This means that the minimum time period on which a category in this chart can be based is a month, rather than a day, an hour, a minute, or a second.

Inspections completed



When the minimum period is set to **Month**, it also means that a chart category can be based on time periods that are longer than a month, such as a year. Dashboards will base categories on time periods that are longer than the minimum period if there is a high density of data categories based on the minimum period. This avoids displaying labels for each category and creating visual clutter. This means that the **Minimum Period** setting also impacts which period labels you can specify patterns for on the **Category Axis** configuration tab. You can't specify patterns for shorter time periods than the one you choose for **Minimum Period**, but you can specify patterns for longer time periods than the one you choose. For example, if **Minimum Period** is set to **Month**, you can't specify a pattern for day labels, but you can specify a pattern for year labels.

Periods Labeling

Period	Pattern
Month	yyyy MMM
Year	YYYY

For more information on how to specify patterns for period labels, see [Format dates](#).

Format numbers

In many places in a dashboard when numbers are shown, Dashboards will attempt to format and parse numbers in a locale-sensitive manner. This means that culturally sensitive patterns are used for representing items such as thousands and decimal separators and percent signs. For example, the number 1 million with two decimal places would be displayed in a dashboard as follows:

- 1,000,000.00 for Canadian and American users
- 1 000 000,00 for French users
- 1.000.000,00 for German users

Dashboards determines a user's locale based on either their language setting in their ArcGIS user profile or if they are accessing dashboards anonymously, the language setting in their web browser.

When the default locale-specific formats aren't appropriate, you can override them by specifying different patterns in the **Pattern** setting for elements such as [gauge](#), [indicator](#), and [serial chart](#).



The following are the number formatting conventions that Dashboards supports. They are based on the [number formatting patterns](#) described in the Unicode Common Locale Data Repository (CLDR) documentation.

- Entering . indicates where a decimal point should be placed.
- Entering , indicates where a thousands separator should be placed.
- Entering 0 indicates where zero-padding should be in the number. If the number is too short, a zero based on the locale's numeric set will display in the dashboard.
- Entering # indicates no padding. If the number is too short, nothing displays in the dashboard.

The following are example number patterns that use some of the above conventions and show how they have different impacts on the number displayed based on whether the user's locale is English, French, or German. All patterns are based on the assumption that the number displays as 1234.567 by default. Note how the characters , and . in the following patterns are replaced by locale-specific characters.

Pattern	English locale	French locale	German locale
###0.##	1,234.57	1 234,57	1.234,57
###0.###	1,234.567	1 234,567	1.234,567
###0.#####	1234.567	1234,567	1234,567
###0.0000#	1234.5670	1234,5670	1234,5670
00000.0000	01234.5670	01234,5670	12345,5670

There is no limit to the number of digits that can be entered in the **Pattern** setting. This means it is not important how many # placeholder characters are entered before the decimal. However, it is best practice to include at least one zero in every pattern.

Special characters

For many characters, no character replacement occurs, and these characters display on a dashboard exactly how they are entered in the **Pattern** setting. Dashboards does support some special characters that represent other characters. For instance, the # character causes a localized digit to appear in its place in a dashboard.

Of the special characters, there are some that are replaced with the same character that was entered in the **Pattern** setting. For example, in the English locale, the grouping character , is replaced by . In this instance, a character replacement still occurs. If the symbols are changed, the grouping character also changes. There are also a few special characters that impact formatting behavior by their presence alone. The percent character (%) results in the value being multiplied by 100 before it appears in the dashboard.

The following table describes the effects of certain special characters on number formats in dashboards:

Symbol	Description
0	A digit.
#	A digit. Zero appears as absent.
.	A placeholder for decimal separators.
,	A placeholder for grouping separators.
E	Separates mantissas and exponents for exponential formats.
;	Separates positive and negative subpatterns. See the note below this table.
-	The default negative prefix.
%	Multiplies the number by 100 and shows it as a percentage.
‰	Multiplies the number by 1000 and shows it as per mille.
¤	The localized currency sign. As mentioned above, HTML decimal or hexadecimal encoding can be used to show currency signs.

Note:

- Using a special character in a pattern as a literal (that is, using the special character without a special meaning) is not supported.
- All patterns are composed of a positive subpattern and an optional negative subpattern, such as #,##0.00;(#,##0.00). Each subpattern is composed of the following: a prefix, numeric part, and suffix. If an explicit negative subpattern has not been entered, the implicit negative subpattern is the - sign appended to the beginning of the positive subpattern. For example, 0.00 alone equals 0.00; -0.00. If an explicit negative subpattern does exist, it determines the negative prefix and suffix, the number of digits, and minimal digits. Other characteristics are not considered in the negative subpattern.

Convert values

For the [gauge](#) and [indicator](#) elements, authors can indicate that numbers should be converted from one unit to another. This is helpful when your data is in a certain set of units, but you'd like it to display in another set of units without changing it. There are many specific use cases for this:

- Length conversions (for example, miles to kilometers)
- Weight conversions (for example, pounds to kilograms)
- Temperature conversions (for example, degrees Celsius to Fahrenheit)
- Power conversions (for example, watts to kilowatts)
- Number conversions (for example, decimal to percent)

In general, value conversion can be represented by the equation $y = mx + b$. Using this simple formula, a number can be converted to any other number along a straight line.

- x = number to be converted
- m = conversion factor (slope) to be applied to x
- b = offset to be applied (y-axis intercept)
- y = number that is displayed in the dashboard

The **Value Conversion** setting is on the **Data** tab for the indicator and gauge. After you enable **Value Conversion**, two additional settings appear: **Factor** and **Offset**.

The **Factor** setting represents the m in the equation $y = mx + b$ and the **Offset** setting represents the b .

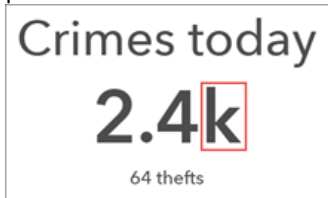
The following table provides some examples of numbers to enter in the **Factor** and **Offset** settings to perform value conversions.

Type of conversion	Factor value	Offset value
Number—Decimal to percent	100	Leave as 0
Temperature—Degrees Celsius to degrees Fahrenheit	1.8	32
Weight—Pounds to kilograms	0.45359237	Leave as 0

You can't enter fractions in the **Factor** setting (for example, 5/9). You can only enter positive and negative decimals and whole numbers.

Unit prefixing

A unit prefix is a specifier or mnemonic that is prepended to units of measurement to indicate a multiple or a fraction of a unit, such as kilo for thousand. When unit prefixing is enabled in Dashboards, symbols of unit prefixes, such as k for kilo, are used to abbreviate numbers. Like [number formatting](#), this can simplify the information presented and make a number easier to interpret. The indicator in the following image has unit prefixing enabled:



Dashboards performs unit prefixing using standard metric prefix symbols. These represent multiplication by powers of 10. For example, the prefix kilo can be added to meter to indicate multiplication by 1,000 (1 kilometer is equal to 1,000 meters). Likewise, the prefix milli can be added to second to indicate division by 1,000 (1 millisecond is equal to 1/1000 of a second). The following tables outline how symbol prefixes can be applied to both large and small numbers in a dashboard.

Prefixes for large numbers

Prefix	Symbol	Multiplier	Exponent
yotta	Y	1,000,000,000,000,000,000,000,000	1024
zetta	Z	1,000,000,000,000,000,000,000	1021
exa	E	1,000,000,000,000,000,000	1018
peta	P	1,000,000,000,000,000	1015
tera	T	1,000,000,000,000	1012
giga	G	1,000,000,000	109
mega	M	1,000,000	106
kilo	k	1,000	103

Prefixes for small numbers

Prefix	Symbol	Multiplier	Exponent
deci	d	0.1	10-1
centi	c	0.01	10-2
milli	m	0.001	10-3
micro	μ	0.000001	10-6
nano	n	0.000000001	10-9

Tip:

The symbol used for a unit prefix can be changed through dashboard-level settings. For example, the symbol for giga could be changed to "B" to indicate billion.

Interactive dashboards

Actions

With multiple elements available to visualize data, dashboards inform the end user at a glance. In its default configuration, the information a dashboard displays changes only when the underlying data refreshes. To provide a more interactive and immersive experience, you can configure actions in dashboards. Actions allow you to give your dashboards a more focused context.

Actions describe what happens when the dashboard's URL parameters change, or when an end user interacts with the dashboard's elements. Actions are initiated by events, and there are three types of supported events: [URL parameter change](#), map extent change, and selection change. The dashboard and many of its elements support different events (and some elements do not support any events). The following table lists the event sources and supported events. Note that the event sources include selectors. These are dashboard elements that can further enhance the interactive capabilities of a dashboard. See [Selectors](#) for details.

Event source	URL parameter change	Map extent change	Selection change
Dashboard	Y		
Map		Y	
Operational layer from a map			Y
List			Y
Serial chart			Y
Pie chart			Y
Category selector			Y
Number selector			Y
Date selector			Y

Tip:

- Always assign dashboard elements a unique and meaningful name on the **General** tab. This is helpful when configuring actions.
- Finish adding elements and make visual refinements to a dashboard before configuring actions.

Actions have a source and a target. An action's source can be the dashboard or one of its elements. An action's target is always one of the dashboard's elements. If the source and target are based on different [data sources](#), the relationship between these sources must be established. This can be either an attribute relationship or a spatial relationship. In an attribute relationship, a field or value from the source element is used to match field values of the target element. In a spatial relationship, feature geometries from the source element are used to intersect geometries of the target element.

Note:

If the source and target are based on the same data source, you don't need to take any steps to establish their relationship.

The following actions are supported:

- **Filter**—Reduces the number of features available to the target element or operational layer when it's rendering

- **Set Extent**—Sets the extent of a target map element
- **Flash Location**—Flashes a geographic location on a target map element
- **Zoom**—Causes a target map element to zoom to a specified location
- **Pan**—Causes a target map element to pan so a specified location is centered
- **Show Pop-up**—Displays an information window on a target map element
- **Follow Feature**—Pans target map elements to stay centered on a particular feature. Only one feature can be followed at a time.

The following table summarizes what can be the source of actions and what can be targets. Some dashboard elements, such as a [map legend](#) and [rich text](#), can be neither the source nor the target of an action and are not listed here.

Dashboard element	Action source	Action target
Dashboard	Y	
Map	Y	Y
Map's operational layer	Y	Y
Serial chart	Y	Y
Pie chart	Y	Y
Indicator		Y
Gauge		Y
List	Y	Y
Details		Y
Embedded Content		Y
Category selector	Y	Y
Number selector	Y	Y
Date selector	Y	




 **Note:**

- The **Show Pop-up** action is only available on an element when it's configured to show features, and its data source represents an operational layer from a map already added to the dashboard. When configuring **Show Pop-up**, its target is automatically selected to be the map the element's data source is from.
- **Follow Feature** is only available on an element when it's configured to show features, and its data source represents an operational layer from a map already added to the dashboard. Additionally, the data source must be point geometries and have a [refresh interval](#) set. When configuring **Follow Feature**, its target is automatically selected to be the map the element's data source is from.
- When **Follow Feature** is triggered, tools appear in the upper left corner of the target map element. These allow the end user to control various aspects of the follow action (for example, pause and resume, show info window, and cancel).
- When a feature is being followed on a map, manually panning or zooming the map will pause the follow. It must be restarted using the tools in the upper left corner.

For more information, see [Configure actions on dashboard elements](#) and [Configure actions on URL parameters](#).

Selectors




A selector describes any dashboard element that supports a selection change event. Since they support events, selectors can trigger [actions](#). The [list](#) element and operational layers on a [map](#) can be considered selectors because you can select rows on a list, and you can select features from the operational layers shown on a map. However, this topic focuses on the category, number, and date selectors.

These selectors can only be added to the [header](#) and [side panel](#). You add a selector to a header or side panel by hovering over it and clicking **Add Category Selector** , **Add Number Selector** , or **Add Date Selector** .

You can configure selectors in various ways. On the **Selector** tab, you can specify properties specific to the element, such as the selector's title and how it's displayed, as well as the data or values on which it's based. On the **Actions** tab, you can specify the actions to be triggered by the selector.

Note:

The amount of vertical space selectors occupy in a panel can differ depending on how they are configured. Some selector configurations are not possible on the header because it has a fixed height. If you can't configure a selector a particular way on a dashboard header, try adding the selector to the side panel or choosing a different selector configuration.

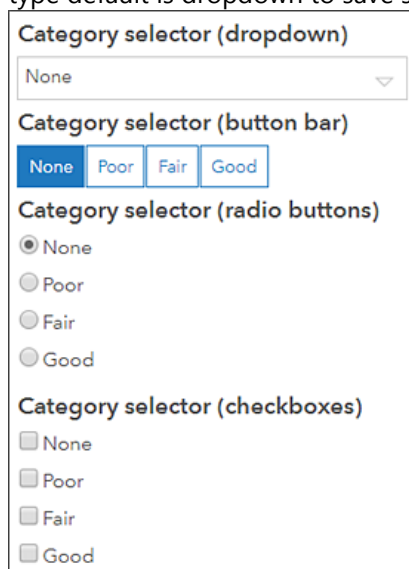
After a selector has been added to a panel, you can change its settings by hovering over it and clicking **Configure element** . You can also change the order in which selectors appear in the panel by clicking **Move down**  or **Move up** .

The [category](#), [number](#), and [date](#) selector properties are described below.

Category selector

The categories in a category selector can be based on a list of static values, features, or summary statistics that are calculated at run time. Category selectors with categories derived from features can be used to apply a spatial filter.

The available preferred display types for this selector are dropdown, button bar, radio buttons, and checkboxes. If the number of values included in the selector exceeds the value of the **Display Type Threshold** setting, the display type default is dropdown to save space in the panel.



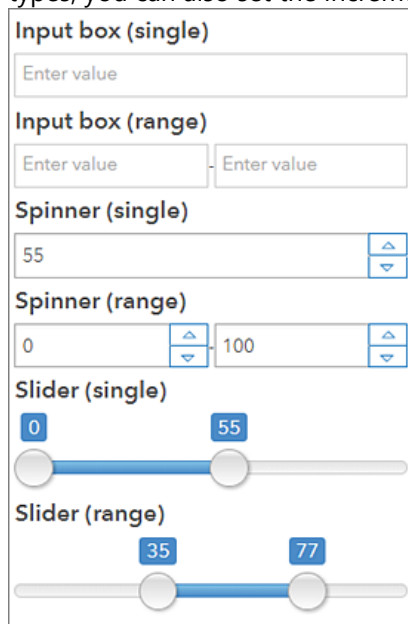
You can also specify whether users can select a single category or multiple categories simultaneously by adjusting the **Selection** setting. Optionally, you can enable the **None Option** toggle, which causes **None** to appear as a category in the selector, allowing you to have nothing selected.

If your selector is based on **Grouped Values**, the categories are automatically generated based on the field names in your data. You can change the display label for a category by clicking **+Override**, entering the category you want to change, and clicking **Add**. When your category is added, you can change its label.

To change the label for most of or all your categories, click **Load Categories** to add all the categories at once and edit their labels.

Number selector

A number selector can be based on a single fixed value or a numeric range. The available display types for this selector are input box, spinner, and slider. If you choose the input box display type, you can specify placeholder or hint text that appears in the boxes. If you choose the spinner or slider display type, you need to define the selector's upper and lower limits, which can be based on either defined values or statistics. For the spinner and slider display types, you can also set the increment by which values increase or decrease in the selector.



Date selector

A date selector can be configured to show predefined date and time options, a date and time picker, or both. When the selector shows predefined dates and times, it can be displayed as a dropdown, a button bar, or radio buttons, the same options as the category selector. Also like the category selector, when you enable the **None Option** toggle, **None** appears as a category in the selector, allowing you to have nothing selected. You can also specify whether the first or last option is selected by default when you predefine the options.

When the selector displays the date and time picker, you can specify whether users can choose a single value from one picker or a range of values from two pickers. You can also control the default values for the date pickers.

When the date selector displays both predefined options and a date picker, the same settings are available for each type as when the selector only contains one type. The only additional setting is **Label for Manual**, which controls how the date picker is referenced in the display of the defined options.

Defined (dropdown)

None ▾

Defined (radio buttons)

None

Last 15 mins



Last 30 mins

Last hour



Last 6 hours

Defined (button bar)



Date picker (single)

12/5/2017  

Date picker (range)

12/5/2017  

-

12/15/2017  

URL parameters

Dashboards can be enhanced through the effective use of URL parameters. A URL parameter is a property that is added to a dashboard's configuration by its author that can be used to trigger actions. In doing so, URL parameters allow the dashboard to be displayed in a prescribed way. URL parameters are also useful when a dashboard is embedded in another app. In this scenario, you can use the hosting app to change the current view of the dashboard.

Note:

With the exception of the built-in locale parameter, changing a dashboard's parameters at run time will not cause it to reload in most modern browsers.

A URL parameter is a name-value pair. In each parameter, the name and value are separated by an equal sign (=). At run time, you can add a parameter to the end of a dashboard's URL using a question mark (?), followed by the parameter.

For example, a dashboard URL containing a parameter could be `<scheme>://<yourPortalUrl>/apps/opsdashboard/index.html#/<id>?param=value`.

For multiple parameters, add an ampersand (&) between each: `<scheme>://<yourPortalUrl>/apps/opsdashboard/index.html#/<id>?param=value¶m2=value2`

Tip:

The order of the parameters does not matter. For example, `param=value¶m2=value2` and `param2=value2¶m=value` produce the same result.

Parameter names are composed of ASCII alphanumeric characters. The dash (-) and underscore (_) are also permitted, in any position other than the first. Invalid characters are blocked at design time with a validation warning. As a best practice, avoid using long parameter names.

Note:

Some parameter names have been reserved for internal use, for example, `mode` and `edit`. When creating a parameter, an **Already used** validation warning occurs if you use a reserved name.

Caution:

URL parameters and selectors are both used to provide interaction between dashboard elements. When used to target the same elements, however, they can contradict one another and cause unexpected results. Take care when designing your dashboard's interactions.

URL encoding

When passing a parameter to a dashboard at run time, encode its value. Encoding ensures that invalid characters are replaced with % followed by their hexadecimal equivalent.

For example, the following passes the value Main Street via a URL parameter:

```
<scheme>://<yourPortalUrl>/apps/op dashboard/index.html#/<id>?param=Main%20Street
```

When passing a URL parameter as a comma separated list of values, keep the following in mind:

- Encode each value separately.

Correct

```
?param=Main%20Street,Broadway%20Avenue
```

Incorrect. Do not encode the comma used to separate values.

```
?param=Main%20Street%2CBroadway%20Avenue
```

- Do not include spaces between values.

Correct

```
?param=Main%20Street,Broadway%20Avenue
```

Incorrect

```
?param=Main%20Street, Broadway%20Avenue
```

URL parameter types

There are five types of URL parameters: category, numeric, date, feature, and geometry. For information on the types of actions that can be triggered by the various parameter types, see [Configuring actions on URL parameters](#).

Category parameter

You can use a category parameter to apply a filter action to one or more elements. At design time, specify the parameter's name, whether inputs will be of type string or number, and whether filter queries will include or exclude the passed in values.

At run time, category parameters accept either a single value or multiple values separated by a comma. Do not include a space after the comma.

When a single value is passed in, the behind-the-scenes query uses the comparative operator equal or not equal to filter the target elements. When multiple values are passed in, the logical IN or NOT IN operators are used.

Examples

In the following table, notes indicate whether the category parameter is configured to expect a string or a number:

Parameter	Note
?status=DAMAGED	String
?status=DAMAGED,DESTROYED	String with multiple values

Parameter	Note
?category=1	Number
?category=1,2	Number with multiple values

Special case examples

Data categories are not always set, or in the case of strings, may be empty. Consequently, category parameters support the following four special cases:

- ((null))
- ((notnull))
- ((empty))
- ((notempty))

Parameter	Note
?status=((null))	Filter for values that are NULL.
?status=((notnull))	Filter for values that are NOT NULL.
?status=((empty))	Filter for values that are empty.
?status=((notempty))	Filter for values that are not empty.
?status=DAMAGED,((null))	Filter for value passed in, OR are NULL.
?status=DAMAGED,DESTROYED,((null))	Filter for multiple values passed in, OR are NULL.

Numeric parameters

You can use numeric parameters to apply a filter action on one or more target elements. At design time, specify the parameter's name and whether the expected input values will be a single value or two values that represent a range. When a single value is used, the parameter is configured to apply one of the following comparison operators:

- equal
- not equal
- less than
- less than or equal
- greater than
- greater than or equal

Tip:

To gain finer control than what the range value type offers, create two single numeric parameters and apply the filter condition (operator) that meets your requirements. At run time, the single parameters are combined with a logical AND operator when applying a filter to the target elements.

At run time, numeric parameters are passed in as a single value or two values separated by a comma.

Examples

In the following table, notes indicate whether the numeric parameter is configured to expect a single value or a range:

Parameter	Note
?meas=10	Single value
?meas=10,15	Range

Special case examples

Numeric values in data are not always set. Consequently, numeric parameters support two special cases: ((null)) and ((notnull)). You can use these special case labels in both single value and numeric range workflows.

Parameter	Note
?meas=((null))	Single date value or numeric range. Filter for values that are NULL.
?meas=((notnull))	Single date value or numeric range. Filter for values that are NOT NULL.
?meas=10,((null))	Single value. Filter for value OR for values that are NULL.
?meas=10,15,((null))	Numeric range. Filter for numbers in range OR for values that are NULL.

Another special case is when a numeric parameter expects a range, but only a single value is provided at run time.

Parameter	Note
?meas=,10	Open-ended left. Values less than or equal to this value are filtered.
?meas=10,	Open-ended right. Values greater than or equal to this value are filtered.
?meas=10	Open-ended right. Values greater than or equal to this value are filtered.
?meas=10,((null))	Open-ended right. Filter values greater than or equal to this value OR are NULL.

Date parameters

You can use date parameters to apply a filter action on one or more target elements. At design time, specify the parameter's name and whether the expected input values will be [ISO 8601](#) date strings or [UNIX Epoch](#).

You can configure date parameters to process a single value or two values that represent a date range. When a single value is used, the parameter is configured to apply one of the following comparison operators:

- is
- is not
- is before
- is or is before
- is after
- is or is after

 **Tip:**

To gain finer control than what the range value type offers, create two single date parameters and apply the filter condition (operator) that meets your requirements. At run time, the single date parameters are combined with a logical AND operator when applying a filter to the target elements.

At run time, date parameters are passed in as a single value or two values separated by comma. When a date parameter is UNIX Epoch, it must be a signed 32-bit integer. When it's a string, dates must be formatted as YYYY-MM-DD or YYYYMMDD. Dates are entered using the Gregorian calendar and are composed of years, months, and days.

- YYYY—Four-digit year (YYYY)
- MM—Two-digit month of the year (01 through 12)
- DD—Two-digit day (01 through 31)

 **Tip:**

The list of date formats supported by date parameters is different than those supported by the serial chart for [parsing dates](#).

A time part can also be included with a date. Times are entered using a 24-hour clock and are composed of hours, minutes, and seconds. You can format them as hh:mm:ss or hhmmss. If no time part is included with the date, the entire day between 00:00:00 and 23:59:59 is implied.

- hh—A zero-padded hour between 00 and 24
- mm—A zero-padded minute between 00 and 59
- ss—A zero-padded second between 00 and 59

If specified, the time part is separated from the date part by a space or an uppercase T. The following are valid dates passed as strings:

Date	Note
2018-10-31	Date only
20181031	Date only (alternate format)
2018-10-31T23:14:42	Date and time separated by T
20181031T231442	Date and time separated by T (alternate format)
2018-10-31 23:14:42	Date and time separated by space
20181031 231442	Date and time separated by space (alternate format)

 **Tip:**

Separating a date and time with an uppercase T is recommended. If you use a space, encode it.

When dates are passed to a dashboard at run time, their time component is assumed to be specified in the local time zone—that is, the time zone of the machine or device on which the browser is running. For additional control, you can also specify time as coordinated universal time (UTC) or as an offset from UTC. To indicate that time is in

UTC, add the letter Z directly after the time without a space. The Z is the zone designator for the zero UTC offset. An offset from UTC is appended to the time in the form \pm hh:mm, \pm hhmm, or \pm hh.

Date	Note
2018-10-31T23:14:42Z	UTC
2018-10-31T23:14:42+01:00	One hour ahead of UTC
2018-10-31T23:14:42+0100	One hour ahead of UTC
2018-10-31T23:14:42+01	One hour ahead of UTC
2018-10-31T23:14:42-05:00	Five hours behind UTC
2018-10-31T23:14:42-0500	Five hours behind UTC
2018-10-31T23:14:42-05	Five hours behind UTC

When constructing filters from date parameters, dashboards examine the target element's [data source](#) for time zone information. If found, queries are sent in that time zone. If time zone information is not found, the target data source is assumed to be UTC. In either case, the dashboard may need to convert input times to match that of the target.

 **Tip:**

If a dashboard receives a date parameter in a format it does not recognize, it is ignored at run time.

Examples

In the following table, notes indicate whether the date parameter is configured to expect a single date or a date range. UNIX Epoch and date string examples are provided.

Parameter	Note
?created=1541027682	Single value using UNIX Epoch.
?created=2018-10-31	Single value using date string, with full day implied.
?created=2018-10-31T23:14:42	Single value using date string with time. Local time zone use is implied.
?created=2018-10-31T23:14:42Z	Single value using date string with time in UTC.

Special case examples

Date values are not always set. Consequently, date parameters support two special cases: ((null)) and ((notnull)). These special case labels can be used in both single value and date range workflows.

Parameter	Note
?created=((null))	Single date value or date range. Filter for NULL dates.
?created=((notnull))	Single date value or date range. Filter for dates that are NOT NULL.
?created=2018-10-31,((null))	Single date value. Filter for October 31, OR dates that are NULL.
?created=2018-10-31,2018-11-05,((null))	Date range. Filter dates in range, OR dates that are NULL.

Another special case is when a date parameter expects a range, but only a single value is provided at run time.

Parameter	Note
?created=,2018-10-31	Open-ended left. Dates on or before will be filtered.
?created=2018-10-31,	Open-ended right. Dates on or after will be filtered.
?created=2018-10-31,((null))	Open-ended right. Filter dates on or after, OR dates that are NULL.

Feature parameters

Feature parameters are used to pass one or more feature IDs to a dashboard. They can be used to filter the dashboard's elements, or they can be used to apply location actions—**Zoom**, **Pan**, **Show pop-up**, **Follow Feature**, and **Flash**—to the dashboard's maps.

At design time, specify the parameter's name and select a data source. The data source's unique ID field must be identified. Failure to select a field that contains nonunique values leads to unexpected behavior at run time.

Tip:

If the selected data source contains polygons, it can be used to apply spatial filters to target elements.

At run time, be sure to URL encode feature IDs if the values in the target layer are strings. Multiple feature IDs can be passed in by separating them with commas, for example, ?asset=1240,1241,1242. Do not include a space after each comma.

Tip:

If a feature parameter is configured to perform a Follow Feature action, only one ID is expected. If multiple values are passed in, only one of the features is followed. The one that's followed does not necessarily reflect the order of the IDs passed in.

Examples

Parameter	Note
?id=11033	Single value
?id=11033,23034,34035	Multiple values

Geometry parameters

There are two types of geometry parameters: point and extent. When the type is point, geometry parameters are used to zoom to, pan to, or flash a location on one or more of the dashboard's maps. When the type is extent, you can use geometry parameters to either set a dashboard's map extents or filter its other elements. At design time, specify the parameter's name and select the geometry type before you configure any actions.

At run time, all geometry coordinates are passed in as comma-separated World Geodetic System 1984 (WGS84) values. For point parameters, the format is `x,y`. For extent parameters, the format is `leftX,leftY,rightX,rightY`. In all cases, there is no space after the comma.

Examples

Parameter	Note
?pt=-75.6971931,45.4215296	Geometry parameter expects a point
?ext=-80.6,40.6,-70.7,47.7	Geometry parameter expects an extent

Switch locale

Dashboards have a built-in URL parameter, called locale, for switching the language, number, and date formats when displaying content. Add the ?locale=<language code> parameter to the end of the dashboard URL. This built-in parameter can be used in conjunction with any author-configured URL parameter by separating multiple URL parameters with an ampersand (&).

The following table lists the supported language codes:

Language code	Language
ar	Arabic
bs	Bosnian
ca	Catalan
cs	Czech
da	Danish
de	German
el	Greek
en	English
es	Spanish
et	Estonian
fi	Finnish
fr	French
he	Hebrew
hr	Croatian
hu	Hungarian
id	Indonesian
it	Italian
ja	Japanese
ko	Korean
lt	Lithuanian
lv	Latvian
nb	Norwegian Bokmål
nl	Dutch
pl	Polish

Language code	Language
pt-br	Portuguese (Brazil)
pt-pt	Portuguese (Portugal)
ro	Romanian
ru	Russian
sk	Slovak
sl	Slovenian
sr	Serbian
sv	Swedish
th	Thai
tr	Turkish
uk	Ukrainian
vi	Vietnamese
zh-cn	Chinese (Simplified)
zh-hk	Chinese (Traditional Hong Kong)
zh-tw	Chinese (Traditional Taiwan)

When using English, Spanish, French, German, and Italian language codes, you can also use the following locales to set the number and date format:

Locale	Number and date format
en-au	English (Australia)
en-ca	English (Canada)
en-gb	English (Great Britain)
es-es	Spanish (Spain)
es-mx	Spanish (Mexico)
fr-ch	French (Switzerland)
de-ch	German (Switzerland)
it-ch	Italian (Switzerland)


The following URL is an example of specifying the French locale:

`https://<yourPortalUrl>/apps/op dashboard/index.html#/4f539791b2f1418cb5403891f1a7be50?locale=fr`

Configure actions on dashboard elements

Actions are configured on the source element, which is the element the user interacts with and triggers events.

To configure an action on an element, do the following:

1. Hover over the element and click **Configure** .
2. Click the **Actions** tab.

 **Note:**

When configuring a [map element](#), there are two tabs related to actions: **Map Actions** and **Layer Actions**.

3. Click **Add Action** and choose an action.
If more than one action is required, repeat this step.
4. Click **Add Target** and choose a target.
To add another target to the action, repeat this step.

The way you configure the source and target elements on your dashboard determines the types of actions you can configure. The following sections outline possible actions based on the configuration of your source and target elements. If a specific source-to-target pair is not listed, that type of interaction is not possible.

Map element


On the **Map Actions** tab, you can configure the following actions to occur in response to a change in the map's extent. The source map's extent is used when setting the extent of another map or applying a spatial filter to another type of target element. See [Map element](#) for more information.

Source element	Possible action	Target element	Target subelement	
Map	Set Extent	Map		
	Filter (spatial)	Map's operational layer		
		List		
		Details		
		Serial chart		
		Pie chart		
		Indicator	Value	
			Reference	
		Gauge	Value	
			Minimum	
			Maximum	
		Embedded content		
		Categories from Grouped Values		
Numeric selector	Minimum			

Source element	Possible action	Target element	Target subelement
			Maximum

Operational layer


On the **Layer Actions** tab, you can configure the following actions to occur in response to a change in selection on an operational layer.

Source element	Possible action	Target element	Target subelement	
Operational layer	Zoom	Map		
	Pan			
	Flash			
	Filter (attribute or spatial)  Note: When the source layer has the polygon geometry type, a spatial filter can be applied to the target element. Point and line features cannot be used to apply spatial filters.		Map's operational layer	
			List	
			Details	
			Serial chart	
			Pie chart	
			Indicator	Value
				Reference
			Gauge	Value
				Minimum
				Maximum
	Embedded content			
Category selector				
Numeric selector	Minimum			
	Maximum			

List element

You can configure the following actions to occur in response to a change to a list's selection.

Source element	Possible action	Target element	Target subelement
List	Zoom	Map	
	Pan		
	Flash		
	Show Pop-up		

Source element	Possible action	Target element	Target subelement	
	Follow Feature	Map's operational layer		
		List		
		Details		
		Serial chart		
		Pie chart		
	Filter (attribute or spatial)	 Note: If a list is configured with a data source that is a feature layer rather than a table, the feature geometries are available to Dashboards and a spatial filter can be applied to the target element.	Indicator	Value
				Reference
			Gauge	Value
	Minimum			
	Maximum			
	Embedded content			
	Category selector			
	Numeric selector		Minimum	
			Maximum	

Serial and pie charts

When a serial or pie chart's source configuration option is Categories from Grouped Values, you can configure the following actions to occur in response to a change in the chart's selection.

 **Note:**

Only dashboard elements based on the same data source as the serial or pie chart can be identified as target elements. This applies to both the Categories from Grouped Values and Categories from Features configuration options outlined below. When a serial chart's source configuration option is Categories from Fields, actions are not supported.

Source element	Possible action	Target element	Target subelement
Categories from Grouped Values	Filter (attribute)	Map's operational layer	
		List	
		Details	
		Serial chart	
		Pie chart	
		Indicator	Value

Source element	Possible action	Target element	Target subelement
		Gauge	Reference
			Value
			Minimum
			Maximum
		Embedded content	
		Category selector	
		Numeric selector	Minimum
			Maximum

 **Note:**


Serial charts can parse data from many field types. When a date-based chart is configured to generate categories from grouped values, actions are only supported when the field being parsed is of type date.

When a serial or pie chart's source configuration option is Categories from Features, you can configure the following actions to occur in response to a change in the chart's selection.

Source element	Possible action	Target element	Target subelement	
Categories from Features	Zoom	Map		
	Pan			
	Flash			
	Show Pop-up			
	Follow feature			
	Filter (attribute)		Map's operational layer	
			List	
			Details	
			Serial chart	
			Pie chart	
		Indicator		Value
				Reference
		Gauge		Value
				Minimum
		Embedded content		
		Category selector		
		Numeric selector		Minimum
				Maximum

Category selector

You can configure the following actions to occur in response to a change in a category selector's value (a selection change event) when the source configuration option is Categories from Features.

Source element	Possible action	Target element	Target subelement
Categories from features	Zoom	Map	
	Pan		
	Flash		
	Show Pop-up		
	Follow Feature		
	Filter (attribute or spatial)  Note: Note: When the source selector is configured for Categories from Features, the feature's geometry is available to Dashboards and a spatial filter can be applied to the target element.	Map's operational layer	
		List	
		Details	
		Serial chart	
		Pie chart	
		Indicator	Value
			Reference
		Gauge	Value
			Minimum
	Maximum		
Embedded content			
Category selector			
Numeric selector	Minimum		
	Maximum		

You can configure the following actions to occur in response to a change to a category selector's value (a selection change event) when the source configuration option is Categories from Grouped Values or Categories from Fixed Values.

Source element	Possible action	Target element	Target subelement
Categories from Grouped Values Categories from Fixed Values Number sector Date selector	Filter (attribute)	Map's operational layer	
		List	
		Details	
		Serial chart	
		Pie chart	

Source element	Possible action	Target element	Target subelement
		Indicator	Value
			Reference
		Gauge	Value
			Minimum
			Maximum
		Embedded content	
		Category selector	
		Numeric selector	Minimum
			Maximum

Number selectors

You can configure the following actions to occur in response to a change to a number selector's value (a selection change event):

Source element	Possible action	Target element	Target subelement
Number selector	Filter (attribute)	Map's operational layer	
		List	
		Details	
		Serial chart	
		Pie chart	
		Indicator	Value
			Reference
		Gauge	Value
			Minimum
			Maximum
		Embedded content	
		Category selector	
		Numeric selector	Minimum
Maximum			

Date selectors

You can configure the following actions to occur in response to a change to a date selector's value (a selection change event):

Source element	Possible action	Target element	Target subelement
Date selector	Filter (attribute)	Map's operational layer	
		List	

Source element	Possible action	Target element	Target subelement
		Details	
		Serial chart	
		Pie chart	
		Indicator	Value
			Reference
		Gauge	Value
			Minimum
			Maximum
		Embedded content	
		Category selector	
		Numeric selector	Minimum
Maximum			

Configure actions on URL parameters

Actions on [URL parameters](#) are configured using the [Dashboard settings](#) window. To open the dashboard settings, click the **Settings** button.



The configuration options you choose for a URL parameter as well as the configuration options set on dashboard target elements determine the types of actions you can configure. The following sections provide an overview of what is possible, but there are nuances. If a specific parameter-to-target pair is not listed, that type of interaction is not possible. If you find that a parameter-to-target pair is not available during dashboard configuration, it means that while generally possible, there is some nuance to the target element configuration that prevents the action.

Note:

It is recommended that you add URL parameters after all dashboard elements have been added and configured.

Category parameter

To configure an action on a category parameter, complete the following steps:

1. On the **URL Parameters** tab on the **Settings** dialog box, click **Add URL Parameter**, and click **Category Parameter**.
2. Fill in the **Label** text box and select **Data Type** and **Operator** values.
3. Click **Add Target** and click a target element
4. Select the **Target Field** for the target element.
5. Repeat steps 3 and 4 for each target.

You can configure the following actions to occur for a category parameter:

Parameter type	Possible action	Target element	Target subelement	
Category	Filter (attribute)	Map's operational layer		
		List		
		Details		
		Serial chart		
		Pie chart		
		Indicator	Value	
			Reference	
		Gauge	Value	
			Minimum	
			Maximum	
		Embedded content		
Category selector				
Numeric selector	Minimum			

Parameter type	Possible action	Target element	Target subelement
			Maximum

Numeric parameter

To configure an action on a numeric parameter, complete the following steps:

1. On the **URL Parameters** tab on the **Settings** dialog box, click **Add URL Parameter**, and click **Numeric Parameter**.
2. Fill in the **Name** text box and select **Value Type** and **Operator** values.
3. Click **Add Target** and click a target element.
4. Select the **Target Field** for the target element.
5. Repeat steps 3 and 4 for each target.

You can configure the following actions to occur for a numeric parameter:

Parameter type	Possible action	Target element	Target subelement
Numeric	Filter (attribute)	Map's operational layer	
		List	
		Details	
		Serial chart	
		Pie chart	
		Indicator	Value
			Reference
		Gauge	Value
			Minimum
			Maximum
		Embedded content	
		Category selector	
		Numeric selector	Minimum
			Maximum

Date parameter

To configure an action on a date parameter, complete the following steps:

1. On the **URL Parameters** tab on the **Settings** dialog box, click **Add URL Parameter**, and click **Date Parameter**.
2. Fill in the **Name** text box and select **Data Type**, **Value Type**, and **Operator** values.
3. Click **Add Target** and click a target element.
4. Select the **Target Field** for the target element.
5. Repeat steps 3 and 4 for each target.

You can configure the following actions to occur for a date parameter:

Parameter type	Possible action	Target element	Target subelement	
Date	Filter (attribute)	Map's operational layer		
		List		
		Details		
		Serial chart		
		Pie chart		
		Indicator	Value	
			Reference	
		Gauge	Value	
			Minimum	
			Maximum	
		Embedded content		
		Category selector		
		Numeric selector	Minimum	
Maximum				

Feature parameter

To configure an action on a feature parameter, complete the following steps:

1. On the **URL Parameters** tab on the **Settings** dialog box, click **Add URL Parameter**, and click **Feature Parameter**.
2. Click the **Change** button to select or change the parameter's data source.
3. Fill in the **Name** text box and select a **Unique ID Field**.
4. Click **Add Action** and click the type of action desired.
5. For the chosen action type, click **Add Target**. Depending on the type of target chosen, fill in any remaining information requested.
6. Repeat step 5 for each target.
7. Repeat steps 4 through 6 for each action.

You can configure the following actions to occur for a feature parameter:

Parameter type	Possible action	Target element	Target subelement
Feature	Zoom	Map	
	Pan		
	Flash		
	Show Pop-up		
	Follow Feature		

Parameter type	Possible action	Target element	Target subelement
	Filter (attribute or spatial)	Map's operational layer	
		List	
		Details	
		Serial chart	
		Pie chart	
		Indicator	Value
			Reference
		Gauge	Value
			Minimum
			Maximum
		Embedded content	
		Category selector	
		Numeric selector	Minimum
Maximum			

Geometry parameter

To configure an action on a geometry parameter, complete the following steps:

1. On the **URL Parameters** tab on the **Settings** dialog box, click **Add URL Parameter**, and click **Geometry Parameter**.
2. Fill in the **Name** text box and select a **Value Type**.
3. Click **Add Action** and click the type of action desired.
4. For the chose action type, click **Add Target**. Depending on the type of target chosen, fill in any remaining information requested.
5. Repeat step 4 for each target.
6. Repeat steps 3 through 5 for each action.

You can configure the following actions to occur for a geometry parameter. The options available differ depending on the **Value Type** chosen (**Point** or **Extent**).

Parameter type	Possible action	Target element	Target subelement
Geometry (Point)	Zoom	Map	
	Pan		
	Flash		
Geometry (Extent)	Set Extent	Map	
	Filter (spatial)	Map's operational layer	
		List	

Parameter type	Possible action	Target element	Target subelement
		Details	
		Serial chart	
		Pie chart	
		Indicator	Value
			Reference
		Gauge	Value
			Minimum
			Maximum
		Embedded content	
		Categories from Grouped Values	
		Numeric selector	Minimum
Maximum			

Charts as the source of actions

[Pie](#) and [serial](#) charts both support having a selection made on them; that is, they support a selection-change event. This means that they can be configured as the source of an [action](#). To understand how chart selection works, a review of their building blocks provides more context.

Chart review

A chart is a graphical representation of one or more [series](#) of data points. Think of a series as an array, and each data point in the array is a name-value pair.

A serial chart can have more than one series, whereas a pie chart has only one. In many chart configurations, it is incorrect to equate a data point with a row or feature of data from your [data source](#). For example, the information on a chart can represent rows that have been grouped on a common attribute and to which a summary statistic has been applied. Similarly, the data may be date based, and the input rows have been grouped or binned to a common unit of time before being displayed on the chart. For these reasons, you need to think of the data you see on a chart in terms of data points.

Every data point rendered on a chart has a shape: rectangle (bar), circular sector (pie slice), or point (with straight or smoother line segments connecting the points).

On a serial chart, the data represented can have discrete or continuous categories (dates). Discrete categories represent unique values, whereas continuous categories represent a time range.

Chart selection

A chart selection represents one or more data points. The selected data points are brought to the forefront by being rendered opaque. All unselected data points are pushed to the background by being rendered semitransparent.

At run time, chart selections are only enabled if the chart has an [action](#) configured. This means that when a chart's selection changes, one or more targets can be affected (for example, another dashboard element, a selector, a map, or a map's operational layer).

The way you configure a chart determines the actions that can be configured.

Configuration option	Possible action
Categories from Grouped Values	Filter
Categories from Features	Pan Zoom Flash Filter
Categories from Fields	Not applicable (selection is not possible)

Note:

In the case of the Filter action, only elements that are based on the same underlying data source can be used as targets.

Charts support two selection modes: single and multiple. When configured for multiple selection, a selection can be created by clicking many data points, or the user can drag across an area of the chart.

 **Tip:**

- When showing continuous categories such as date-based data, each selected data point represents a range of time. The size of the range is determined by the minimum period on the chart's configuration.
- When showing discrete categories—that is, not date based—a serial chart's category axis label can be used to create a selection. This is particularly useful on multiseriers charts.
- Clicking a data point selects it. Clicking it again deselects it.
- Clicking anywhere that does not represent a data point on a chart clears the selection.
- Some charts have legends displayed. Clicking the legend removes the related data points from the chart. If those points happen to be selected when the legend is clicked, clicking the legend again does not reselect the affected data points.

Design

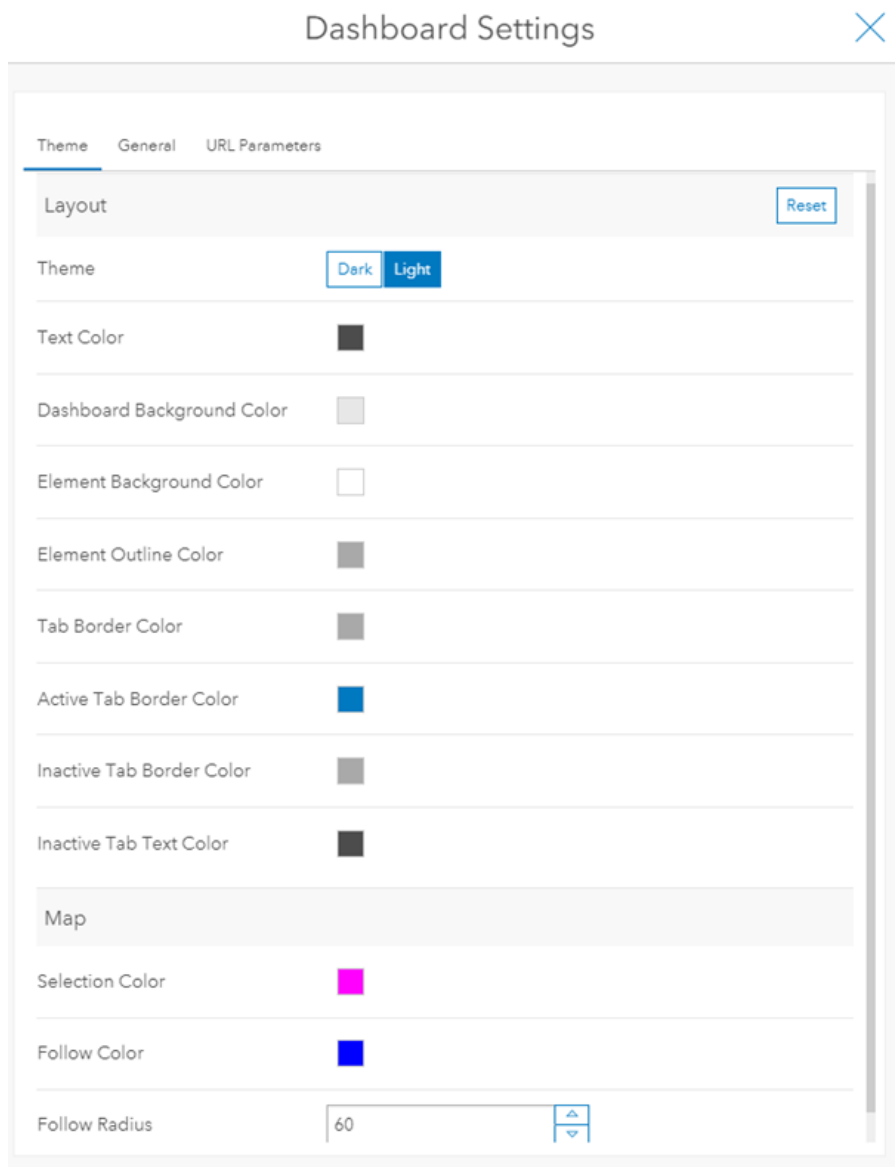
Dashboard settings

You can use the dashboard **Settings** dialog box to control many aspects of the dashboard's appearance and behavior. To open it, click the dashboard's **Settings** button.



Theme

On the **Theme** tab, you can select colors to match your organization's branding. Choose contrasting colors for accessibility, low-light conditions, or field use. Configure the **Follow Radius** and **Follow Color** parameters to make your real-time tracking features easier to see.



General

On the **General** tab, you can give users the flexibility to resize elements. Since dashboards occupy 100 percent of your browser window, they don't always look the same on all screens.

Dashboards perform unit prefixing using standard metric prefix symbols. In the **Number Prefixes** section of the **General** tab, set your symbols to be used throughout the dashboard wherever [unit prefixing](#) is enabled.

Dashboard Settings ✕

Theme General URL Parameters

General

Allow element re-size

Number Prefixes Reset

Prefix	Factor	Symbol	Enabled
yotta	10 ²⁴	Y	<input checked="" type="checkbox"/>
zeta	10 ²¹	Z	<input checked="" type="checkbox"/>
exa	10 ¹⁸	E	<input checked="" type="checkbox"/>
peta	10 ¹⁵	P	<input checked="" type="checkbox"/>
tera	10 ¹²	T	<input checked="" type="checkbox"/>
giga	10 ⁹	G	<input checked="" type="checkbox"/>
mega	10 ⁶	M	<input checked="" type="checkbox"/>
kilo	10 ³	k	<input checked="" type="checkbox"/>
deci	10 ⁻¹	d	<input type="checkbox"/>
centi	10 ⁻²	c	<input type="checkbox"/>
milli	10 ⁻³	m	<input type="checkbox"/>
micro	10 ⁻⁶	μ	<input type="checkbox"/>
nano	10 ⁻⁹	n	<input type="checkbox"/>

URL parameters

URL Parameters make dashboards dynamic, whereby a single dashboard can power any number of different views. Learn more about [URL parameters](#) and how to [configure actions on URL parameters](#).

Dashboard Settings ✕

Theme General URL Parameters

[Add URL Parameter](#) ▼

Use custom icons

When configuring an [indicator](#), you have the option to use a Scalable Vector Graphics (SVG) icon, which is not included in the element by default. This functionality ensures that dashboards can align with industry-specific requirements or the look and feel of your organization's corporate branding. The SVG format is an XML-based vector image format. Icons can be created in any text editor or using drawing software. At run time, custom icons will scale to the same height as the Middle Text content in the indicator.

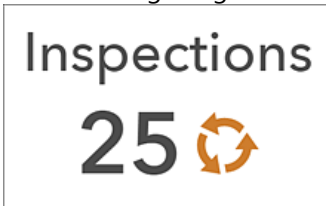
The following example shows SVG content that displays as a counter-clockwise series of three arrows. This could be used to indicate a work in progress.



You can try out this functionality by copying and pasting the following SVG code into the blank box under **Custom** in the **Select an icon** screen:

```
<?xml version="1.0" encoding="UTF-8"?>
<svg xmlns="http://www.w3.org/2000/svg" id="icons">
  <path d="M13.91 9a6.003 6.003 0 0 1-5.658
4.9871-.347-1.992c.032.001.063.005.095.005a3.996 3.996 0 0 0
3.858-3h-1.749l2.75-3.912L15.61 9zm-8.668 1.877l-.002.002a3.945 3.945 0 0
1-.688-4.884l-1.809-.848a5.923 5.923 0 0 0 1.08 7.148L2.59
13.529l4.71.822-.82-4.711zm1.425-6.576l-.011-.067a3.97 3.97 0 0 1 4.575
1.431l1.194-1.697a5.941 5.941 0 0 0-6.119-1.718L6.018.607 2.64 3.994l4.33 2.03z" />
</svg>
```

The following image shows how the indicator could look with the custom icon:




The following tips may be helpful when you create your own icon:

- If you don't define a stroke or fill in your SVG icon, these items can be adjusted when authoring the indicator in your dashboard.
- If you don't define a stroke in your icon, you can add one at configuration time. It will be 1 pixel.
- Drawings in SVG format can be dynamic and interactive; however, script-based animations are not supported and will be stripped out.

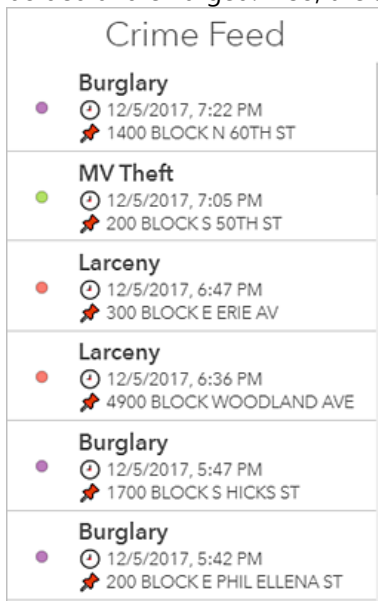
Effective use of HTML

The visual appearance of a dashboard can be greatly improved through the effective use of HTML. In general, you have substantial control and flexibility over your dashboard's display through using a combination of rich text, field names, links, and [other supported HTML](#) in elements.

Many elements, such as the [rich text](#) element, come with a what-you-see-is-what-you-get (WYSIWYG) text editor that provides common word processing formatting options. This significantly simplifies the creation of great-looking content.

When you need to include more advanced HTML formatting, such as web content tags, click **Source**  and enter the HTML directly into the source.

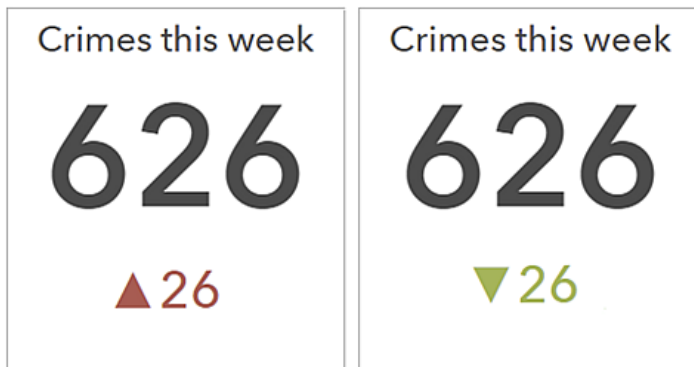
For example, below is a [list](#) that has been enhanced with custom HTML. The first line in each list item has been bolded and enlarged. Also, the second and third text lines in each item have HTML symbols.




The HTML used to create this list could look like the following:

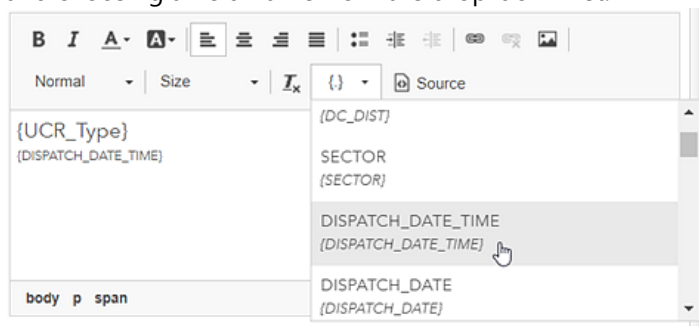
```
<h3 style="font-size:medium">
  <strong>{UCR_Type}</strong>
</h3>
<p style="font-size:12px">&#128344; {DISPATCH_DATE_TIME}</p>
<p style="font-size:12px">&#128204; {LOCATION_BLOCK}</p>
```



HTML symbols can enhance the aesthetics of your dashboard, as well as increase situational awareness. For instance, you can configure an [indicator](#) to display triangles that make it easy to see whether crime counts have increased or decreased compared to last week's counts.



To include an HTML symbol not found on your keyboard in an element, you can copy and paste the symbol from another website directly into the rich text editor, or in various other dashboard settings such as the text settings in the indicator. Alternatively, you can enter the symbol's decimal (dec) or hexadecimal (hex) reference code in these places. For example, to include the upward pointing triangle (▲) in the indicator, you can use its dec code of `▲` or its hex code of `▲`.

You can also add field names to your elements. At run time, the values in the referenced fields will display in the dashboard and update dynamically. For all elements, you can do this by entering the field name directly into the HTML source. For some elements, such as the list, field names can be inserted into the HTML by clicking **Insert**  and choosing a field name from the drop-down list.



Insert  only appears on the rich text editor when feature attributes are available. For instance, **Insert**  will not display when configuring an element's title or description.

Share

Dashboard URLs

Dashboards created with Dashboards can be opened directly with their URL.

Dashboard URLs are structured as follows:

```
<scheme>://<portalDomain>/apps/opsdashboard/index.html#/<id>
```

Open a saved dashboard

To open a saved dashboard, use its item ID at the end of the URL, as shown in the following example:

```
https://<yourPortalUrl>/apps/opsdashboard/index.html#/4f539791b2f1418cb5403891f1a7be50
```

Dashboards that have been shared publicly can be accessed using the www.arcgis.com domain in addition to your organizational domain, as shown in the following example:

```
https://www.arcgis.com/apps/opsdashboard/index.html#/4f539791b2f1418cb5403891f1a7be50
```

Tip:

Publicly shared dashboards that reside in organizations that have had [anonymous access](#) disabled are accessible via an organizational domain.

URL parameters

Dashboard URLs are flexible, in that authors have the option to [configure URL parameters](#) that trigger dashboard actions at run time. This makes dashboards dynamic because the URL parameters enable a single dashboard to power any number of unique views. For more information, see [URL parameters](#).

Secured and subscriber content

Once assembled, a dashboard is shared with its intended audience. It can be shared publicly with everyone or with only people within your organization. In this context, there are some [data source](#) considerations to be made when it comes to secured or subscriber content.

Secured content

Dashboards can include data from [ArcGIS Server web services](#). These services may or may not have been secured. When secured, the dashboard will prompt the user for credentials when the service is being accessed. This prompt can be avoided if the [shared secure service](#) has had credentials stored. In this case, the service item will proxy requests to the service using the stored credentials.



Tip:

You can use the technique of proxying service requests to enable access to [subscriber content](#) as an alternative workflow to the one described below. In the case of premium subscriber content, consider limiting the usage of the shared service items by rate limiting or by designating specific referrer URLs or IP addresses that can access the service.

Subscriber content


Dashboards can include data from the [ArcGIS Living Atlas of the World](#) (a curated subset of ArcGIS Online items maintained by Esri and the ArcGIS community). Much of the content found in the ArcGIS Living Atlas is available to the public with no restrictions. Other content, however, is not available publicly, and requires a subscription to an ArcGIS organization. This is referred to as [subscriber content](#).

There are two variations of subscriber content:

- Subscriber content is the collection of layers published by Esri that requires an organizational subscription account to access. Subscriber content does not consume credits.
- Premium content is a subtype of the subscriber content. Like subscriber content, premium content requires an organizational subscription account to access. The difference is that premium content consumes credits.

When a dashboard referencing subscriber content has been [shared](#), the user experience can be affected. Organizational members will enjoy seamless access to the content. Because they are authenticated by their organization when accessing the dashboard, their account is used to access the content.

The same cannot be said for dashboards accessed anonymously (by members of the public, for example). Because they are not authenticated, users will be prompted to enter credentials that they don't have.

As the dashboard's author, you can grant access to subscriber content using your account. When you configure the dashboard, click the **Options** button  on the navigation bar and click **Subscriber Content**. On the dialog box that appears, enable all the content you want to grant access to. Content flagged as premium will consume subscription credits. Optionally limit the usage of subscriber content by specifying the maximum number of requests allowed for a specific time interval. When all subscriber content has been enabled in a dashboard, anonymous users will no longer be prompted for credentials.

Reference

General FAQ

- [Does ArcGIS Dashboards support anonymous access to dashboards that are shared with everyone?](#)
- [Can I view dashboards on my tablet?](#)
- [Can I view dashboards on my phone?](#)
- [Can I embed another app within my dashboard?](#)
- [Can I embed my dashboard in a web page?](#)
- [Can I use subscriber and premium content in a dashboard?](#)
- [How can I provide feedback?](#)

Does ArcGIS Dashboards support anonymous access to dashboards that are shared with everyone?

Yes. Dashboards that are shared with everyone can be viewed by anyone in your organization. To author or edit dashboards, members in your organization must have privileges to create content.

Can I view dashboards on my tablet?

Yes. However, you cannot author or edit dashboards on a tablet.

Can I view dashboards on my phone?

Yes. However, you cannot author or edit dashboards on a phone. Furthermore, dashboard authors should take care to [design dashboards](#) that will work well in a reduced form factor. Limiting the number of elements displayed, judicious use of text, and taking advantage of a dashboard's ability to group and stack elements are all key considerations.

Can I embed another app within my dashboard?

Yes. Use the embedded content element to do this.

Can I embed my dashboard in a web page?

Yes. You can embed your dashboard in an iframe. It is recommended that you make your embedded dashboard as large as possible on the page to maximize usability.

Can I use subscriber and premium content in a dashboard?

Yes. See [Secured and subscriber content](#) for details.

How can I provide feedback?

The ArcGIS Dashboards team would love to hear from you. If you have feedback or inquiries, you can provide them within the [GeoNet ArcGIS Dashboards](#) community page. You can also send an email to dashboards@esri.com. If you are experiencing other issues, contact [Esri Technical Support](#).

ArcGIS Dashboards requirements

To use ArcGIS Dashboards, the following requirements must be met. You can use the app in any of the [supported languages](#).

Browser requirements

Dashboards work best in web browsers on desktops and tablet devices. Browsers running on smartphone devices are supported, but dashboard authors must design dashboards that will look good when displayed on such a reduced form factor. For best performance, use the latest version of one of the following browsers:

- Chrome
- Microsoft Edge
- Firefox
- Safari

Supported languages

Dashboards supports [all the languages that the Enterprise portal supports](#).

The language used by the app is determined by your browser's language setting if you are not signed in to an organization. If you are signed in, the language is determined by the language settings of your ArcGIS user profile.

Best Practices

Create web maps for dashboards

A good dashboard starts with a good [map](#), and configuring your map to take advantage of the latest mapping functionality will enhance its effectiveness. The following are recommendations for creating useful web maps:

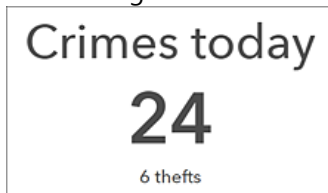
- Set appropriate refresh intervals—Refresh intervals determine how often the operational layer updates and how often elements in your dashboard update that use the map as their data source. See [Set refresh interval](#) for details. You can also set a refresh interval on the media in your pop-ups, which can appear in elements such as the [details](#) element. See [Show images](#) for details.
- Exclude irrelevant data from operational layers—Apply filters on operational layers so that only the information needed is shown. See [Apply filters](#) for details.
- Switch operational layer visibility—Too many operational layers in a map can be a distraction. Be sure to uncheck the box next to unnecessary operational layers in the **Contents** pane of your map. Note that even if an operational layer is not visible in the map, it can still be used as a [data source](#) for other elements in a dashboard.
- Set visible range—Multiscale maps enable you to view certain data at specific scales or zoom levels. See [Set visible range](#) for details.
- Adjust pop-up fields—The fields specified in feature pop-ups determine the information displayed in many dashboard elements. See [Configure pop-ups](#) for details, and be sure to take advantage of the ability to [show images](#), such as traffic cameras, if you have them.
- Bookmark areas of interest—You can bookmark areas of importance or relevance on a map. See [Bookmark places](#) for details.
- Style your data—A map is powerful because of its ability to show data in a variety of ways. However, due to its complex nature, it's sometimes hard to get your data to tell the right story when displayed on a map. Fortunately, there are many styling options to explore and techniques to try. See [Change style](#) for details.
- Include labels for map layers—Labels are short pieces of text that can provide clarity to a map. See [Create labels](#) for details.
- Choose appropriate colors—When [choosing the basemap](#) and colors for layers in your map, consider the type of environment where the dashboard will be used. For instance, if the dashboard will appear in a dark room, use a darker basemap. In this situation, you should also use darker colors for symbolizing layers, such as deep oranges. Conversely, for a dashboard that will be used in a bright light, consider using lighter colors for the map.

Author effective dashboards

The best dashboards are informative, clear, and beautiful. You can make operational decisions by quickly glancing at them, or at most performing some light analysis. Stephen Few, a leading information technology teacher and consultant who focuses on best practices for creating visualizations of business data, has said that dashboards must be designed to support real-time situation awareness by expressing performance measures clearly, precisely, and without distraction. Put differently, they must grab your attention when necessary, make it easy to identify what's most important in the screen, and provide the ability to understand what's happening and respond immediately. For dashboards to do this, they need expert visual design.

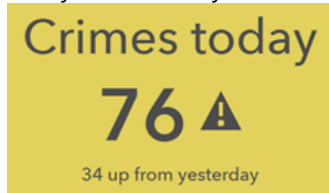
Here are some best practices for making dashboards:

- **Determine your audience and why it needs a dashboard**—A good first step is to determine who the audience of your dashboard is, and which questions they need to answer by using your dashboard. The answers to these questions should inform every design decision you make. This information is especially useful when deciding which information is relevant and should be included in the dashboard. When possible, it's best to make a dashboard for one audience, so you can tailor the dashboard to that audience's requirements. One dashboard with information that's relevant to some users but not all isn't as useful as two dashboards that only contain pertinent information for each audience.
- **Omit irrelevant information**—Only include information that users need to know. Additionally, information that's relevant but not essential is distracting and decreases the dashboard's usability.
- **Keep it simple**—Resist the urge to add unnecessary visual elements and media to your dashboard. Keep the number of visual elements in a dashboard to seven or fewer. The main objective of a dashboard is to present information clearly, and unnecessary visualizations clutter dashboards. Keeping dashboards simple will also ensure smooth performance.
- **Provide context**—Stand-alone numbers are often not very useful for understanding your operational status. Contextual information, such as target or historical values, makes current values more meaningful and helps users decide whether a situation warrants attention. Context can also assist users in identifying concerning trends, which can lead to actions that prevent problems (Few 2017). You can provide context in your dashboard by setting reference values in [indicators](#), including guides in [serial charts](#), or using charts that are more appropriate for showing time-series data, such as line or area charts.



- **Choose the right chart**—Various chart types and styles are supported. Using the appropriate chart for your data will help make clear what you want to show to users.
- **Notify users of important events**—Increase your organization's responsiveness by configuring the dashboard so that users are immediately notified when something occurs that requires action. Ideally, include no more than two notifications in a dashboard to avoid flooding users with noncritical notifications (Few 2017). You can draw attention to updates in a dashboard by using conditional formatting. This causes an element's appearance to change based on your data. The [indicator](#) is one of the elements that supports conditional formatting. For example, you can configure it to turn yellow and include an exclamation point when the number of crimes has

increased by more than 20 compared to yesterday, and appear with a white background the rest of the time, so that you can easily tell whether or not the number of crimes has significantly increased.



- Arrange and size elements appropriately—Organize and size elements based on their importance and relationships with each other. The elements with the most important information should be the largest and have the most prominent locations in the dashboard (Few 2017). Place the most essential elements in the upper left corner of your dashboard, and the least essential in the lower right, since most people read from upper left to lower right. Also, group highly related elements so that they always appear next to each other and it's easier to see their close relationship. The map and map legend elements, as well as the list and details elements, are commonly grouped together.
- Use color wisely—A common design problem with dashboards is that they have too much color. This can make them visually overwhelming and difficult to read. Only use color to display data differences, and when other methods to do so aren't as effective. When you do use color, take advantage of the default color sets available in certain elements, such as serial and pie charts. The colors in these sets are designed to look good together. Another common problem is the use of red and green, which look the same to people with color blindness (Few 2017).
- Consider where the dashboard will be used—Think about the environment in which the dashboard will be used when designing it. If the dashboard will be used in a dimly lit office, consider using the dark theme to make it pop more. If the dashboard is going to be displayed on a monitor wall, as opposed to a desktop machine, it should be easy to read from a distance. Also, you should author a dashboard to look good at the screen resolution and zoom levels at which it will be displayed. In general, it's recommended to test your dashboard in the workspace it will be used in before sharing it with users.

To get started authoring your own dashboard, see [Create a dashboard](#).

Sources:

Few, S. 2007. "Dashboard Design for Real-Time Situation Awareness." Perceptual Edge. Accessed August 1, 2017. http://www.perceptualedge.com/articles/Whitepapers/Dashboard_Design.pdf.

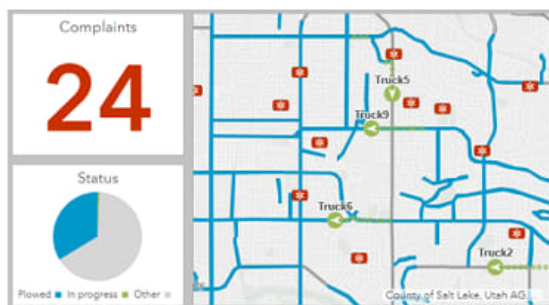
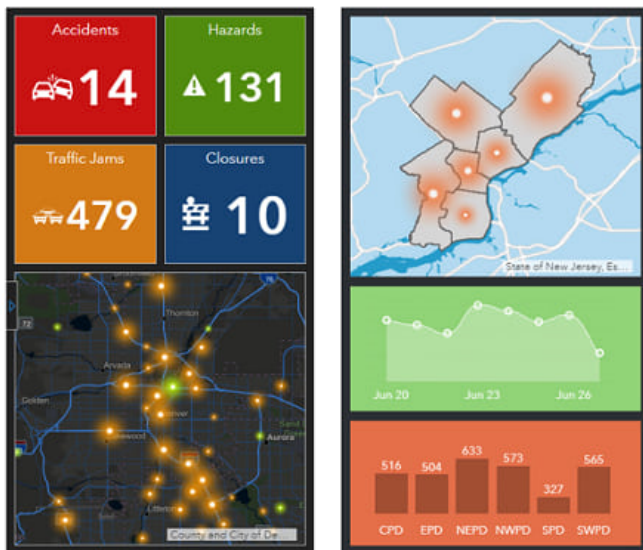
Dashboards on your smartphone

The most important thing to consider when designing a dashboard for mobile use is that you should not try to make it compete with or replace existing dashboards. A mobile dashboard should complement other dashboards and does not need to be comprehensive. Like any other dashboard, the design of a mobile dashboard should start with a thorough understanding of the end user:

- What is this person's role in the organization?
- In what scenarios will this mobile dashboard be used?
- What organizational goals are reached with mobile data access?

A dashboard displayed on a phone should be kept as simple as possible.

Most mobile users have little or no need for in-depth visualizations, and interaction between elements should be limited. The small screen size of a mobile device is not suitable for in-depth analysis. Another consideration is that mobile users are probably not sitting down and do not have an input device such as a mouse to initiate dashboard interactivity. If a mobile dashboard has too many visuals, it is likely not focused enough.



Because mobile dashboards have less screen space than their desktop counterparts, it can be challenging to create an aesthetically pleasing interface and still provide users the ability to get the answers they need at a glance. One way to do this is to use color effectively, and using contrasting background and foreground colors is one technique that can be effective. With contrasting colors, metrics and outliers will stand out more.

Many mobile dashboards are about conveying performance. Indicators and gauges are often the best visualizations, as information can be consumed quickly and action can be taken immediately in response to it.

 **Tip:**

- When showing charts, limit the use of text and grids.
- Limit or avoid visuals that contain too much information to be consumed quickly. This includes details, lists, and legends.

Best practices

General best practices for designing mobile dashboards are as follows:

- Choose a phone orientation (portrait or landscape) and design for it. Dashboard elements are designed to take up 100 percent of the display and do not realign themselves with changes in the display's aspect ratio.
- Take advantage of the fact that many desktop browsers (for example, Google Chrome) have built-in tools that enable you to get a close approximation of how your dashboard will look on mobile devices. When assembling your dashboard, periodically turn these tools on to get a sense of how things look, and adjust sizes, text, and colors as necessary.
- Take advantage of the fact that dashboard elements can be expanded at run time to fill the entire display.
- Use a dashboard's ability to [group and stack](#) elements to your advantage, but be conservative. You should not try to re-create a desktop dashboard for your phone by overusing these abilities. When used, stacks (tabs) should be renamed to reflect their content.
- When adding elements to the dashboard, do not add any unnecessary text such as titles and descriptions.
- Don't add a [header](#) to your dashboard unless it needs one.
- Limit the amount of text you place in each element's title and description (or omit text in these areas altogether).
- For all elements, keep the **Last Update Text** option off.
- For the pie chart and serial chart, turn off the **Hover Text** option.

Best practices for maps and legends are as follows:

- Maps should be as simple as possible. Limiting a map to one operational layer whose symbology contrasts with the background basemap is ideal. This will make the map easier to interpret and faster to draw, and it reduces the amount of data being downloaded to your device over what may be a slow network connection.
- Disable pop-ups on the operational layers. Tapping a single feature on a phone is difficult, and there isn't as much space on the phone to show an info window on top of the map as there is on your desktop.
- Consider whether a refresh interval is necessary. Many mobile dashboards will be opened and then immediately closed once the information they display has been consumed.
- When adding a [map](#) to a mobile dashboard, avoid enabling map tools such as search, layer visibility, legend, basemap switcher, and so on. They are rarely needed in mobile situations.
- Because the map used on a mobile dashboard should be simple to understand, adding a [map legend element](#) is typically unnecessary.

Best practices for interactive dashboards are as follows:

- Dashboard [actions](#) should be kept to a minimum.

- Use [selectors](#) sparingly. When you use them, consider placing them on a [side panel](#) configured to slide over the dashboard rather than on a dashboard header.