

Fire Hydrant Inspections 3.0

Introduction to Fire Hydrant Inspections

Fire Hydrant Inspections can be used to perform routine fire hydrant inspections and monitor fire department hydrant inspection programs that ensure every hydrant performs reliably when an emergency occurs.

Every year, firefighters and civilians are injured, or killed, in structure fires. When a structure fire occurs, every second counts, and proper water supply can mean the difference between life and death. Hydrant inspections enable fire agencies to assess hydrant operability, test for adequate water supply, and properly allocate resources based on hydrant locations.

The National Fire Protection Association (NFPA) 291 Standard guides fire and water departments through best practices for water flow testing and fire hydrant marking. Per NFPA 291, hydrants should be flushed and inspected annually, and flow tests should be completed every five years. While hydrant inspections may seem like a given today, they are often neglected for other duties, and are especially time consuming if still done on paper. Forward thinking fire departments have implemented procedures that streamline hydrant inspections and simplify access to information during an incident.

The Fire Hydrant Inspections solution delivers a set of capabilities that help you inventory fire hydrants, conduct routine inspections, monitor hydrant inspection programs, and share operating status with firefighters.

Requirements

Fire Hydrant Inspections requires the following:

- ArcGIS Online
- ArcGIS Field Maps

Information products

Fire Hydrant Inspections includes the following information products:

Item	Description	Minimum user type
Fire Hydrant Inspections	An ArcGIS Field Maps map used by firefighters to inspect the condition of hydrants and document defects.	Mobile Worker
Fire Hydrant Inspections Dashboard	An ArcGIS Dashboards app used by fire command staff to monitor hydrant inspection programs.	Viewer
Fire Hydrant Inspections Notebook	An ArcGIS Notebooks used by fire analyst to assign hydrant inspections to specific stations and shifts.	Creator

Fire Hydrant Operability layer	A map layer used by fire personnel to share hydrant locations, flowrate, and operating status in other public safety information systems.	Viewer
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Release notes

The following are the release notes:

Version	Description
3.0 (March 2025)	- The WaterDistributionSystem feature layer and feature layer views have been updated to provide more detailed attribution for supply features and to add support for editor tracking fields. - The Fire Hydrant Inspections Notebook has been updated to use the new FireHydrant_firehydrants and FireHydrantOperability_flowrate feature layer views. - The Fire Hydrant Inspections web map and Fire Hydrant Inspections Dashboard web map and app have been updated to use the new feature layer and feature layer views.
2.0 (Jun 2023)	- A new Fire Hydrant Inspections map that can be used with ArcGIS Field Maps. - A new Fire Hydrant Inspections Dashboard. - A new Fire Hydrant Inspections Notebook. - A new Fire Hydrant Operability layer.
1.1 (Jun 2021)	- A new Fire Hydrant Inspections map that can be used with ArcGIS Field Maps. - A new Fire Hydrant Inspections Dashboard. - A new FireHydrants_public feature layer view that can be used to share the location of fire hydrants and their operating status with internal stakeholders. - A series of enhancements to the FireHydrants layer and related feature layer views.
1.0 (Nov 2020)	First release of Fire Hydrant Inspections

Configure Fire Hydrant Inspections

Fire Hydrant Inspections can be used to perform routine fire hydrant inspections and monitor fire department hydrant inspection programs that ensure every hydrant performs reliably when an emergency occurs.

In this topic, you'll learn how to configure the Fire Hydrant Inspections solution to meet specific needs in your organization.

Tip:

As you configure the solution, record the configurations or alterations you make with each version in a change log. This information will be valuable if you upgrade to a new version and need to evaluate the effort required.

Organize your data

Fire Hydrant Inspections solution uses fire hydrants and fire service district data. Fire hydrant data can be acquired from water utilities or other management systems. Before you begin configuring the solution take some time to organize your data.

Two foundational data sets are used in the solution. Fire Hydrants data is required to configure the solution. Fire Service Districts data is optional and supports visualization and inspection assignments.

Fire Hydrants

The Fire Hydrant Inspections solution is built on the same foundational feature layer, WaterDistributionSystem, as the Water Utility Hydrant Inspections solution. If you have also deployed the Water Utility Hydrant Inspections solution, you can use that solution to manage hydrants and other water distribution assets. As a shared service between the two solutions, the Fire Hydrant layer within the WaterDistributionSystem feature layer is used by the Fire Hydrant Inspections solution for fire hydrant inspection workflows. The Fire Hydrant Inspections solution can be used independently or with the Water Utility Hydrant Inspections solution.

The solution requires the following fields to be populated:

- Asset ID
- Asset Type
- Lifecycle Status

Fire Service Districts

The FireServiceDistricts layer is used to store administrative and response districts maintained by Fire Service agencies. This can include agency, battalion, district, inspector, mutual aid, reporting, station, still, and wildland-urban interface boundaries. This data must be a polygon and each geography should have a unique value in the Name field. The data loaded into the FireServiceDistricts layer should reflect how fire agencies assign fire hydrant inspections. The

FireServiceDistricts layer is used in the Fire Hydrant Inspections Notebook app to support station and shift assignments and is used in the Fire Hydrant Inspections map to visualize fire station boundaries.

The solution requires the following field to be populated: Name.

Note:

The WaterDistributionSystem layer is used in other ArcGIS Solutions, such as Adopt-A-Hydrant and Water Utility Hydrant Inspections. The Fire Service Districts layer is used in both the Pre-Incident Planning and Fire Incident Dashboard solutions. If you already loaded data into these layers, the solution is deployed under the same user account, and the solutions are using the same feature layers within your ArcGIS organization then you do not need to load data again.

Load data from a shapefile or file geodatabase

You can load data into the Fire Hydrant Inspections solution using the update data capability in your ArcGIS organization. Optionally, in ArcGIS Pro you can use the [Append](#) tool or [Update Features With Incident Records](#) tool.

To load data from a shapefile or file geodatabase, complete the following steps:

1. Create a .zip file of your shapefile or file geodatabase.
2. Verify that you are signed in to your ArcGIS organization and browse to the WaterDistributionSystem feature layer.
3. From the item page, select the Fire Hydrant sublayer.
4. From the item page, click **Update Data**.

Tip:

You may need to click the expand button  to see all options.

5. Follow the steps in the **Update data** wizard to load your data.

Tip:

For more information about uploading data, see [Manage hosted feature layers—Append data to layers](#).

6. Repeat these steps to load data into the FireServiceDistricts layer.

Note:

The WaterDistributionSystem layer contains additional layers besides Fire Hydrant and are not required for the Fire Hydrant Inspections solution. These additional sublayers can be ignored unless you are using them in another solution.

Tip:

After loading fire hydrant data, you can update the Fire Hydrant sublayer periodically as development occurs in your community and new fire hydrants are added.

Configure solution for metric system

Note:

This workflow is optional and does not need to be completed to work with the solution.

The Fire Hydrant Inspections solution is configured with the imperial system calculating flow rate in gallons per minute (GPM). If your fire agency uses the metric system, you can configure the solution to calculate flow rate in liters per minute (LPM).

To update the Fire Hydrant Inspections map to leverage the metric system, complete the following steps:

1. Verify that you are signed in to your ArcGIS organization and browse to the Fire Hydrant Inspections map.
2. From the item page, click **Open in Field Maps Designer**.

Tip:

You may need to click the expand button  to see all options.

3. Click the **Forms** tab.
4. Click **Tables** and then, click **Hydrant Inspections**
5. Scroll down to the Calculate group and click Flow Rate (GPM).
6. In Properties update the Display name from Flow Rate (GPM) to Flow Rate (LPM).
7. Scroll down in Properties to Calculated value, click the **Settings** button, click the **Ellipse** button, and then click **Edit Arcade**.
8. In the Arcade Editor, replace the value 29.83 with .666 and then click **Done**.
9. Click Available Fire Flow (GPM).
10. In Properties update the Display name from Available Fire Flow (GPM) to Available Fire Flow (LPM).
11. Click **Save to map**.

Use Fire Hydrant Inspections

The Fire Hydrant Inspections solution delivers a set of capabilities that help you inventory fire hydrants, conduct routine inspections, monitor hydrant inspection programs, and share operating status with firefighters.

In this topic, you will learn how to use the solution by assuming the role of a user and performing the following workflows.

Note:

Use your organization's data or configured apps to follow these workflows.

Assign Inspections

Note:

This workflow is optional and does not need to be completed to work with the solution.

Fire hydrant inspections are assigned on an annual basis or can be conducted by canvassing streets or areas within the community. To assign inspections on an annual basis use the Fire Hydrant Inspections Notebook app. The Fire Hydrant Inspections Notebook app uses the Fire Service District layer and Fire Hydrant layer to make assignments based on station, shift, inspection due date, and the inspection type.

Note:

You must be assigned a role of Administrator or custom role which includes the privilege to Create and edit notebooks in order to run an [ArcGIS Notebooks](#) and complete the following steps.

In this workflow, you will assume the role of fire analyst who will use the ArcGIS Notebooks app to set the assignment type, assigned station, assigned shift, and assignment due date for each hydrant.

1. Verify that you are signed in to your ArcGIS organization and browse to the Fire Hydrant Inspections Notebook app.
2. Click **Run** and choose **Run All Cells**.
The notebook will run and a new dialog will appear.
3. In the dialog choose the assignment due date.
By default, the end of year is configured.
4. Choose the minimum number of years between flow tests.

Tip:

The minimum number of years between flow tests is set to 4 years by default, to ensure that every hydrant is flow tested every 5 years. NFPA 291 states that flow tests should be conducted every 5 years.

5. Click the **Setup Annual Hydrant Inspection Assignments**
6. Click the FireHydrant_firehydrants layer, click the **Data** tab and verify the Assignment Type, Assignment Due, Assigned Station, and Assigned Shift have values.

Once the Fire Hydrant Inspections Notebook app has run then you must update the Fire Hydrant Inspections map symbology to reflect the assignments by station and shifts.

1. Verify that you are signed in to your ArcGIS organization and browse to the Fire Hydrant Inspections map.
2. From the item page, click **Open in Map Viewer** to view the map.
3. At the bottom left, click the **Expand** button to view the **Context** (dark) toolbar. The tools on this toolbar allow you to manage and view map contents.
4. At the bottom right, click the **Expand** button to view the **Settings** (light) toolbar. This toolbar includes options for configuring and interacting with map layers and other map components.
5. In the **Context** toolbar, click the **Layers** button to view and verify the Fire Hydrants layer is selected.
6. In the **Settings** toolbar, click the **Styles** button, click **Styles options** button.
7. Navigate to the **Unassigned** symbol and click the **Select all values** button and choose **New group**.
8. Optionally, configure the symbols colors and adjust the group name.

Collect new hydrant

In some cases, fire departments may access hydrant data maintained by a water utility to use for inspections. In other cases, hydrant data may not exist, and a field assessment may be used to capture hydrant locations and their operational status.

In this workflow, you will assume the role of a firefighter who needs to collect a new fire hydrant in the community.

1. Download ArcGIS Field Maps onto your mobile device.
2. Open ArcGIS Field Maps and sign in to your ArcGIS organization.
3. Tap the **Fire Hydrant Inspections** map to open it.
4. Browse to the collection location.
5. Tap **Location**.
The map will zoom to your current location.
6. Tap **Add** and tap **Add Point**
7. Tap **Update Point**.
8. Swipe up and add additional information for the fire hydrant.
9. Tap **Notes** to enter any other observations noted in the field.

10. When you are finished, at the upper right, tap the check mark or **Submit**.

Note:

Your interface may vary depending on the type of mobile device that you use.

11. Repeat steps 4 to 10 for each additional fire hydrant.

Perform flush inspection

Flushing fire hydrants is often an annual workflow that ensures fire hydrant operability, ease of access, and recycles the water in the distribution pipes. When exercising the operability of a hydrant, firefighters often need to note physical characteristics and any required maintenance of the hydrant while in the field.

In this workflow, you will assume the role of a firefighter who needs to perform a flush inspection on an existing fire hydrant.

1. Download ArcGIS Field Maps onto your mobile device if you haven't already.
2. Open ArcGIS Field Maps and sign in to your ArcGIS organization.
3. Tap the **Fire Hydrant Inspections** map to open it.
4. Browse to the collection location.
5. Tap **Location**.
The map will zoom to your current location. Hydrants can also be searched by assigned station or assigned shift.
6. Tap **Related** and tap **Add** to create a new inspection record.
7. Swipe up on the inspection form, tap **Station Completing Inspection** and choose a value.
8. Tap **Inspection Type** and choose **Flush**.
The **Operability** section is now visible on the inspection form.
9. Tap **Is the hydrant operable** and choose **Yes**.
10. Tap **Flush complete?** and choose **Yes**.
11. Tap **Flow duration** and enter a value.
12. Tap to open the **Maintenance** section, then tap any question to choose a value.
13. When you are finished, at the upper right, tap the check mark or **Submit**.

Note:

Your interface may vary depending on the type of mobile device that you use.

Perform flow test inspection

Fire hydrant flow tests are often performed to evaluate water pressure capabilities under various distribution-system flow conditions. The resulting pressure readings inform responding crews of the operational capabilities of the hydrants within proximity to the emergency. When performing a flow test, there are typically five variables that crews record from the field to inform the water flow capabilities.

In this workflow, you will assume the role of a firefighter who needs to perform a flow test inspection on an existing fire hydrant.

1. Download ArcGIS Field Maps onto your mobile device if you haven't already.
2. Open the app on your mobile device, and sign in to your ArcGIS organization.
3. Tap **Fire Hydrant Inspections** to open it.
4. Browse to the collection location.
5. Tap **Location**.
The map will zoom to your current location. Hydrants can also be searched by assigned station or assigned shift.
6. Tap **Related** and tap **Add** to create a new inspection record.
7. Swipe up on the inspection form, tap **Station Completing Inspection** and choose a value.
8. Tap **Inspection Type** and choose **Flow Test**.
The **Operability** section is now visible on the inspection form.
9. Tap **Is the hydrant operable** and choose **Yes**.
10. Tap to open the **Maintenance** section, then tap any question to choose a value.
11. Tap **Pitot Pressure** and enter a value.
12. Repeat Step 11 for the **Discharge Coefficient**, **Outlet Diameter**, **Static Pressure**, and **Residual Pressure**.
The inspection form automatically calculates **Flow Rate (GPM)** and **Available Fire Flow (GPM)** by using the Q formula and Hazen-Williams formula as outlined in NFPA 291.
13. When you are finished, at the upper right, tap the check mark or **Submit**.

Note:

Your interface may vary depending on the type of mobile device that you use.

Monitor fire hydrant inspection program

Fire hydrant inspection programs are run on a recurring interval, typically annually. During the inspection cycle, fire command staff can reference the status of the inspection program to make informed decisions.

You will now assume the role of fire command staff and will use the Fire Hydrant Inspections Dashboard to monitor the progress of fire hydrant inspections.

1. Verify that you are signed in to your ArcGIS organization and browse to the Fire Hydrant Inspections Dashboard app.
2. From the item page, click **Open Dashboard**.
3. Review the high-level metrics of the dashboard, including total inspections, out of service hydrants, and inspections by station and type.
4. On the top, in the header panel, use filters to explore inspections by type, station, date, and lifecycle status. By default, the dashboard shows inspections from year to date.

Note:

Dashboard charts are linked. If you click a column the **Inspections completed by station** or a slice in the **Inspections by type** chart, related details are filtered and updated in other elements in the dashboard.

5. In the hydrant list, click a hydrant to zoom to its location to see the inspection status.