

Fire Accreditation Analysis Documentation 1.0

Introduction to Fire Accreditation Analysis

Fire Accreditation Analysis can be used to complete spatial analysis workflows and generate maps based on the Commission on Fire Accreditation International (CFAI) Accreditation Model Information Technology Specifications.

The CFAI and the [Center for Public Safety Excellence](#) works with fire agencies around the world to encourage continuous improvement and promote standards of excellence. This accreditation process demonstrates that a fire agency is committed to continuous improvement, serving the community efficiently, and providing a fair and safe work environment for all personnel. Accredited fire agencies submit an annual compliance report that documents self-improvement efforts. After accreditation has been granted, fire agencies are required to submit annual performance appraisals and risk assessments. Fire Accreditation Analysis is typically implemented by fire departments, agencies, and districts that want to enhance hazard risk analysis and measure service delivery over time.

The Fire Accreditation Analysis solution delivers a set of capabilities that help fire agencies complete a standard set of spatial analysis workflows and generate a series of maps that conform with the spatial requirements included in the CFAI Accreditation Model Information Technology Specifications.

Requirements

Fire Accreditation Analysis requires the following:

- ArcGIS Online
- ArcGIS Pro 3.0 or later (Basic, Standard, or Advanced)

Information products

Fire Accreditation Analysis includes the following information products:

Item	Description	Minimum user type
Fire Accreditation Analysis	An ArcGIS Pro project used by fire analysts to conduct relevant spatial analysis workflows and generate a standard set of maps so you can reduce the time it takes to produce Fire Accreditation, Standards of Cover, and Annual reports.	GIS Professional (Basic, Standard, or Advanced)
Fire Accreditation Viewer	A Portfolio app used by internal stakeholders to understand if continuous improvement objectives are being met.	Viewer

Configure Fire Accreditation Analysis

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

Organize your data

Fire Accreditation Analysis uses your data to generate maps based on the Commission on Fire Accreditation International (CFAI) Accreditation Model Information Technology Specifications. Before you open the Fire Accreditation Analysis project, take some time to organize your source data.

Two foundational data sets (geographic planning zones and incidents) are required to complete the analysis workflows in the Fire Accreditation Analysis project.

Geographic planning zones

Geographic planning zones are required to complete analysis workflows in each criterion. They can be fire station response areas, neighborhoods, census tracts, or any other polygonal area. Geographic planning zones must have a unique name to be used in the analysis workflows.

Incidents

The accreditation process requires three to five years of incident data that is typically sourced from your records management system. This historical data can be exported from your records management system in a comma-delimited text file (CSV file) or spreadsheet and imported into ArcGIS. Incident data must have the following fields to be used in the analysis workflows:

- Incident identifier
- NFIRS code
- NFIRS property use code
- Call date
- Total time
- Address or Longitude, Latitude (x,y)

Additional source data

As you identify the accreditation maps you wish to generate, you may need to organize other source data. In total, the following data is required to complete every analysis workflow in the Fire Accreditation Analysis project:

- Agency service area boundary
- Other service area boundaries (mutual aid, contract areas)
- Fire protection and detection systems
- Occupancy inspections
- Public education programs
- Fire stations
- Fire hydrants
- Critical infrastructure

Much of this data is typically sourced from shapefiles, file geodatabases, or other spatial data your organization manages. If this data is not currently managed in ArcGIS, it can be imported from a comma-delimited text file (CSV file) or spreadsheet. The source data must have the following fields to be used in the analysis workflows:

- Unique identifier
- Date
- Address or Longitude, Latitude (x,y)

Other data

The following data is sourced from ArcGIS Living Atlas of the World and used in analysis workflows when you sign in to your ArcGIS organization:

- Population density and growth
- Transportation systems
- Topography, geology, physiology, and climate
- Area land use
- Hazards (natural, environmental, industrial, social and domestic)
- Demographic and socio-economic

Access infographics

To access the Fire District Risk Assessment Report Template and create an infographic for your community you will need to join the Fire Accreditation Analysis group in ArcGIS Online.

Follow the steps below to join the Fire Accreditation Analysis group and access the report template.

1. In a browser, sign in to your ArcGIS organization and then browse to the [Fire Accreditation Analysis group](#).
2. Click **Join this group**.
You should see the Fire District Risk Assessment Report Template. If the template is not visible then click **View all content** or refresh your browser.

Note:

When completing task 2A.7 in the Fire Accreditation Analysis ArcGIS Pro project, follow the instructions in the task pane to access the shared Fire District Risk Assessment Business Report Template.

Adjust risk score

Section 2B.4 of the CFAI Accreditation Model Information Technology Specifications defines a methodology that can be used to understand risk in your community. This risk score has a default risk range of 1 through 3 (low, medium, high) and summarizes the probability (frequency of past occurrence) and consequence (property use codes to determine the severity). Using the default values, your risk map will have a range of 2 through 6. In some cases, you may alter your risk range and use a wider range, for example 1 through 10. If you do modify the risk ranges, ensure that the probability and consequence scores have the same risk range.

Note:

This workflow is optional and doesn't need to be completed in order to work with the solution.

Modify consequence and probability range

Follow the steps below to modify the consequence and probability range values for non-EMS incidents.

1. Open the Fire Accreditation Analysis project in ArcGIS Pro.
2. Open the **2B - Hazard Risk Assessment** map.
3. Click the **Contents** tab, and then scroll down and open the **Property Use Lookup** table.
4. In the **ConsequenceScore** adjust the values field to your new range
5. Click the **Edit** tab.
6. Click **Save**.
7. Open the **Apply risk methodology for all non-EMS incidents (2B.4)** task.
8. Run the **Select NFIRS Codes** and **Determine frequency of incidents** steps.
9. In the **Number of Classes** parameter, use the same number as the highest value that you used for the consequence score. (For example, if using a 1-10 range you would enter 10).
10. Click **Run** to calculate the probability score based on the new range.

Configure Fire Accreditation Viewer

When you open the Fire Accreditation Viewer for the first time, it will include a single section for the Area Characteristics map. Follow the steps below to add additional accreditation map to the Fire Accreditation Viewer.

1. In a browser, sign in to your ArcGIS organization and then browse to the Fire Accreditation Viewer app.
2. From the item page, click **Configure**.
Close the **Welcome to the App Setup Page** splash page, if necessary.
3. Click **Portfolio**, and then click **Add a New Section**.
4. Click **Browse for content**, and then browse to the web map you created in the Share with your organization task in the Fire Accreditation Analysis ArcGIS Pro project.
5. Click **Select Section** to add the web map to the portfolio app.
6. Click the **Section Description** from the drop-down list and then add a description about that map that you can share with your stakeholders.
7. Click **Publish**.
8. Click **Launch**.

Use Fire Accreditation Analysis

The Fire Accreditation Analysis solution delivers a set of capabilities that help fire agencies complete a standard set of spatial analysis workflows and generate a series of maps that conform with the spatial requirements included in the CFAI Accreditation Model Information Technology Specifications.

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

Review the Fire Accreditation Analysis project

Follow the steps below to download and review the Fire Accreditation Analysis project.

1. Sign in to your ArcGIS organization and browse to the Fire Accreditation Analysis Desktop Application Template.
2. From the item page, click **Download**.
3. Unzip and open the Fire Accreditation Analysis ArcGIS Pro project.
4. In the **Catalog** pane, expand the **Tasks** folder, and double-click the **Fire Accreditation Analysis** task.
5. In the **Tasks** pane, expand the **Getting to know Fire Accreditation Analysis** task group to see the collection of tasks.
6. Double-click **Fire Accreditation Analysis project structure** to review the organizational structure and task workflow.
7. Double-click **Organize your data** to review the standard data layers used in the project and learn about potential sources for the data you will need.
8. Double-click **Sign in to your ArcGIS organization** to use content available in the ArcGIS Living Atlas.

Create fire accreditation maps

The 10th Edition of Commission on Fire Accreditation International (CFAI) Model contains eleven unique criterion and over forty different core competencies or performance indicators. Although all these criteria must be documented, not all of them can be mapped. As a result, the [\(CFAI\) Model Information Technology Specifications](#) provides a list of spatial data required for the accreditation process. For each spatial data element in the list, there is a reference to the core competency or performance indicator used in a map that supports the criteria.

Preparing for accreditation, community risk reduction or standard of cover is time consuming and data intensive. The structured set of tasks included in the Fire Accreditation Analysis project reduces the time it takes to conduct the required analysis, and increase the quality of the fire accreditation maps.

In this workflow, you will assume the role of a fire analyst or GIS analyst who wants to create one, or more, fire accreditation maps.

Area characteristics (Criterion 2A)

The first criterion in the accreditation model is to document the area characteristics—or distinct natural, human, and development characteristics—for a defined service area. In task 2A.3, a planning zone layer is created and will be used in subsequent tasks to create maps of area characteristics such as population density, transportation, land use, socio-economic and demographic information, critical infrastructure, and other local characteristics.

1. Identify the area characteristics maps you would like to generate.
2. To create area characteristics maps, open the **Area characteristics (Criterion 2A)** task group and follow the steps in each task.

Hazard risk assessment (Criterion 2B)

Hazard risk assessment maps identify, assess, classify, and categorize hazard risks. Historical incident data is used to define the risk using the two-axis methodology of probability and consequence. The frequency of each type of fire incident determines the probability. Property-use codes are used to classify higher-risk properties and determine the consequence. Total response time is used to determine the consequence for emergency medical services (EMS) incidents.

1. Identify the hazard risk assessment maps you would like to generate.
2. To create hazard risk assessment maps, open the **Hazard Risk Assessment (Criterion 2B)** task group and follow the steps in each task.

Note:

The 2B.2: Data Preparation tasks must be completed before any other task in this group.

Current deployment and performance (Criterion 2C)

Deployment and performance maps illustrate how well current deployment and performance meet identified service demands. They leverage National Fire Protection Association (NFPA) 1710 and use standard response times for first due (4 minutes) and effective response force (8 minutes) for low, and medium, hazards.

1. Identify the deployment and performance maps you would like to generate.
2. To create deployment and performance maps, open the **Current deployment and performance (Criterion 2C)** task group and follow the steps in each task.

Response capabilities (Criterion 2D)

Response capabilities maps evaluate current deployments and future service demands. They highlight risks associated with development in a community and illustrate a plan is in place to maintain, and improve response capabilities if growth, or development, were to occur.

1. Identify the response capabilities maps you would like to generate.
2. To create response capabilities maps, open the **Response capabilities (Criterion 2D)** task group and follow the steps in each task.

Community risk prevention program (Criterion 5A)

A community risk prevention program documents the frequency of occupancy inspections and uses inspection data to identify where occupancy risks can be mitigated by increasing the frequency of fire code inspections.

1. To create risk prevention maps, open the **Community risk prevention program (Criterion 5A)** task group and follow the steps in each task.

Public education program (Criterion 5B)

Community risk prevention programs use public education campaigns to mitigate risks identified during an assessment. Public education maps evaluate risks (for example, cooking fires or household hazards) and identify gaps in public education programs.

1. To create public education program maps, open the **Public education program (Criterion 5B)** task group and follow the steps in each task.

Fixed facilities (Criterion 6B)

Fixed facility maps identify the location of fire stations, administrative offices, training facilities, communications centers, logistics, and supply centers.

1. To create fixed facilities maps, open the **Fixed facilities (Criterion 6B)** task group and follow the steps in each task.

Water supply (Criterion 9A)

Water supply maps identify water distribution assets (for example, hydrants) in a community. They also identify coverage gaps or locations where reliable and adequate water pressure is not present.

1. To create water supply maps, open the **Water supply (Criterion 9A)** task group and follow the steps in each task.

Share fire accreditation maps

Fire accreditation maps and geospatial content created with the Fire Accreditation Analysis project can be shared with others in your organization. Sharing maps can be especially valuable during the accreditation process to ensure that the correct information is included in accreditation documents.

To share fire accreditation maps, open the **Share fire accreditation maps** task group and follow the steps in the task.

Review fire accreditation maps

You will assume the role of an accreditation manager in a fire department. You have been asked to review maps created for your fire accreditation document.

Follow the steps below to review fire accreditation maps created by your fire analyst, or GIS analyst.

1. In a browser, sign in to your ArcGIS organization and then browse to the Fire Accreditation Analysis solution.
2. Open the Fire Accreditation Viewer app item page, and then click **View**.
3. Read the Welcome information on the splash screen and then click **Explore**.
4. At the top of the map, click each tab to view the contents for each map.

Note:

Review Configure Fire Accreditation Analysis for more information on adding content to the app to meet the needs of your organization. If you have not completed this step, the app will choose default maps for display purposes.