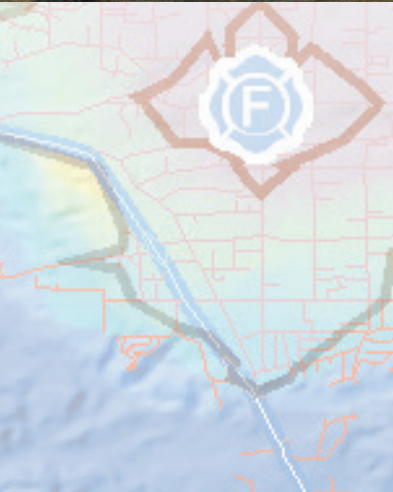


A Quick Guide to Building a GIS

For Your Public Safety Agency



NAPSG Foundation



Introduction

Reasons to Use GIS

Increasingly, public safety practitioners recognize the importance of geographic information system (GIS) technology to support the public safety mission.

Creating, maintaining, and managing an effective information system is critical to the mission of today's emergency operations. This booklet provides practical advice on how to partner with the right people in your community to build a GIS that serves the needs of public safety.

Developing a fire department or public safety agency GIS is an exciting journey. Use this booklet as a resource for getting started.



How to Use This Guide

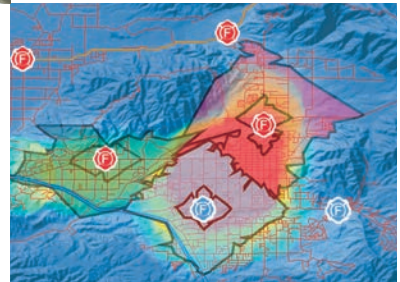


Plume Modeling and Analysis for Training and Response

Pages 4–7 of this guide describe a set of fundamental concepts and principles universal to a successful public safety GIS. Whether you are new to GIS or an experienced user, please review these pages first.

The tabbed sections, beginning on page 9, are where the action starts. Each tab represents a crucial phase in building your GIS: assessing needs, planning using the system, and managing the system. A checklist is provided for each of these phases. You will occasionally find yourself back at step one, reviewing your needs assessment. This will actually keep you on track, driving your GIS program development in the right direction.

This guide is designed to be interactive. It also points you to additional resources and information.



Calculating response times allows fire departments to determine optimal station locations.

Understand GIS Basics

A GIS is an information system that understands location.

Much more than a map, a true GIS is intelligent and interactive. Why? Because of two universal characteristics that make GIS a unique information system:



1 GIS is layercentric.

Map projects are built with layers of data. Each of these layers can be stored in a standard relational database management system (RDBMS). In this way, a GIS combines the visual benefit of a map with the power of a database. Data can include

- Basemaps
- Roads/Infrastructure
- Land use/Land cover
- Environment
- Weather information
- Vehicle locations

2 GIS is more than a map.

In a map project, GIS sorts all these different types of data by their common geography. This is what gives GIS its distinctive analytic ability. Because information can be organized by a specific place on the earth, you can see relationships between otherwise disparate datasets. GIS provides you with the type of situational awareness that enhances incident-level decision making and saves lives.

These principles always apply:

- Geography integrates and organizes all kinds of data.
- Collect data once and use it often for multiple purposes.
- GIS is a team activity.

GIS Is a Team Sport

Seek Support and Identify Benefits

You should seek executive-level support and identify departmental benefits. Start small with the capability to grow—GIS is scalable. If GIS is a team sport, there has to be a head coach, and that coach needs a good assistant coach.

Head Coach (The Chief)	Assistant Coach (Technical Analyst)
Policy direction	Efficient operations
Budget support	Training
Accountability	Performance measurement

Other Agencies Can Help

You will likely find many departments and agencies in your community that benefit from GIS. Knowing who else in your community uses GIS and has data to share is essential. Building relationships, leveraging existing GIS data, and establishing a support network will serve you well. You will find that GIS users are good at sharing.

Integration with Other Departments Is Key

- Identify and engage all stakeholders.
- Maximize sustainability of technology investments.
- Support data development.
- Avoid duplication of efforts.



Public Safety Information Needs

GIS Must Work for You and Your Mission

GIS supports many different public safety jobs and functions. You may have seen GIS being used to plan a station location or support response with location information, maps, and incident data.

Summary of Fire Department Use Benefits

Situational Awareness Community Infrastructure ▪ Population ▪ Risk ▪ Incidents ▪ Damage

Planning	Preparedness	Response	Recovery
<ul style="list-style-type: none"> ▪ Inspections ▪ Community Risk Assessment ▪ Hazard Analysis ▪ Vulnerability Assessment <ul style="list-style-type: none"> - Hazards - Risks - Values ▪ Program Planning ▪ Public Information ▪ Scenario Development ▪ Map Documents <ul style="list-style-type: none"> - Station Maps - Briefing Maps - Map Books 	<ul style="list-style-type: none"> ▪ Inventory/Asset Management ▪ Capability Assessment ▪ Deployment Analysis ▪ Preplanning ▪ Targeted Mitigation ▪ Training and Exercises ▪ Management, Analysis, and Budget Support ▪ Executive Dashboard ▪ Public Information 	<ul style="list-style-type: none"> ▪ CAD, AVL, and Routing ▪ Mobile/Field Intelligence ▪ Multidisciplinary Coordination ▪ Search and Rescue ▪ Incident/Resource Management ▪ Personnel/Asset Tracking and Staging ▪ Evacuation/Shelter/Mass Care ▪ Public Warning and Notification ▪ Command and Control ▪ EOC/DOC Management ▪ Environmental Hazards ▪ Hazmat Analysis/Tracking 	<ul style="list-style-type: none"> ▪ Damage Assessment ▪ Logistics ▪ Infrastructure Restoration ▪ Public Information ▪ Lifeline Restoration ▪ Mitigation Assessment ▪ Economic and Community Recovery ▪ Debris Removal ▪ Reentry

Data Management

Community Infrastructure ▪ Population ▪ Risk ▪ Incidents ▪ Damage

The Checklists

Whatever your expectations are for implementing a GIS for your fire/rescue department, using the checklists in the following steps will help you stay on track.



✓ **Assess**

The first step is to assess your agency's need for GIS. Here, you will learn about how other agencies have used GIS effectively. Once you know the options, you will begin to determine which uses are most relevant to your agency's planning and operations.

✓ **Plan**

The planning step is a discovery process. This is where you will learn about what resources already exist in your community to help you build your GIS. As you plan, you will match your highest-priority needs to existing resources.



✓ **Use**

Step three, using GIS for public safety, involves bringing all the right components together to successfully deploy a GIS tailored to your goals. By collaborating with other agencies and departments, you'll take advantage of a system using outside expertise and resources.

✓ **Manage**

The final step—managing your GIS—is where you'll demonstrate achieved results and gain support. You'll begin to spread awareness of your program through the successes you attain. You'll also continuously evaluate and refine your system.



The goal is to develop a plan that identifies easy wins—needs that you can quickly fulfill—with a longer-term plan in mind.



Assessing Needs for Fire/Public Safety GIS

To discover how GIS can be used to support your agency's planning and operations, you must first determine your agency's particular needs.

Refer back to page 6 of this guide. The chart on that page lists many different kinds of GIS applications fire and public safety agencies find useful.

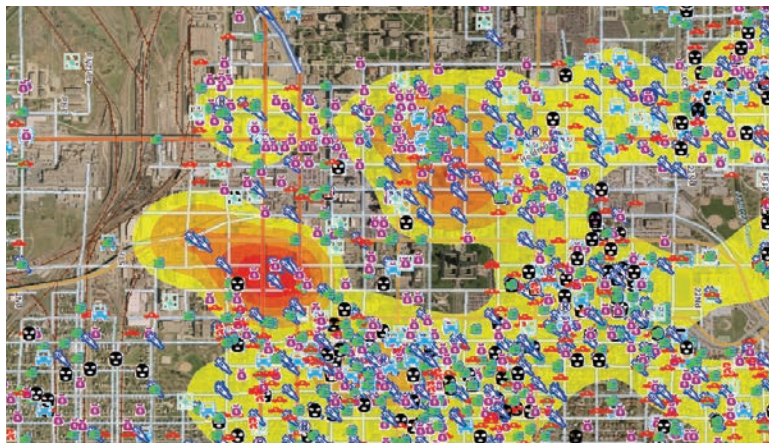
There are many ways you can learn about public safety GIS. Go to the National Alliance for Public Safety GIS Foundation (NAPSG) website (www.napsgfoundation.org) Best Practices, Resource Portal, or Capability and Readiness Assessment Tool to access best practice case study examples and supporting implementation guidance.

As you read these case studies and best practices, think about all the ways your agency might benefit from GIS.

Share your thoughts with others, both inside and outside your agency.

The main goal in this step is to create a wish list of all the ways your agency can benefit from a well-designed GIS system and ensure that your department's strategic and financial plan supports the implementation of a GIS system that meets your needs.

GIS analysis of crime incidents and crime density.



Checklist for Assessing Needs



Building a Fire/Public Safety GIS

Once you have developed a comprehensive list of the ways in which GIS can benefit your agency, you will begin to figure out where to start with your GIS project.

- ❑ Identify available data sources and gaps where data development is required.
- ❑ Identify GIS expertise and required training.
 - ❑ GIS analyst/technician
 - ❑ Data/Training sources
 - ❑ Other agencies using GIS
- ❑ Network with GIS user groups in your area to leverage lessons learned.
- ❑ Conduct a needs assessment at www.napsgfoundation.org.

Strategic Planning for Fire/Public Safety GIS

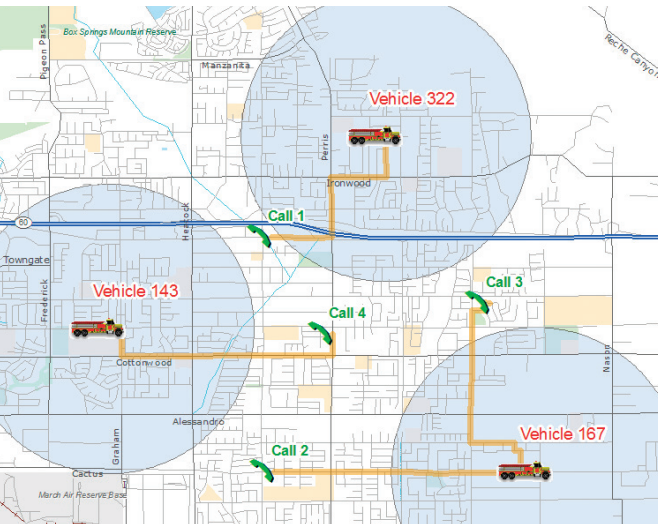
Think about . . .

- Where are the greatest needs?
- What is of greatest interest to your staff?
- What essential problems can GIS solve for your department?
 - Map books
 - Incident-level situational awareness
 - Preincident planning
 - Response-time analysis
 - Incident command and control
- What are the biggest gaps?
 - Data
 - GIS software
 - Hardware
 - Expertise and technical training
- What are the most significant obstacles?
 - Staffing and budget cuts
 - Lack of communication and collaboration
 - Lack of policies and governance for information and data sharing
- What are your unique needs and how will they impact your GIS resources?
- Where do needs and benefits intersect?
 - Sharing costs and maximizing cost benefit
 - Gaining GIS capabilities to support common problems throughout multiple agencies
 - Building bridges for increased communication and collaboration throughout agencies and neighboring jurisdictions



And discover the most likely early wins.

Checklist for Planning a GIS



GIS analyzes variables such as drive time, distance, and street impedances to determine which unit is closest to the call.

Building a Fire/Public Safety GIS

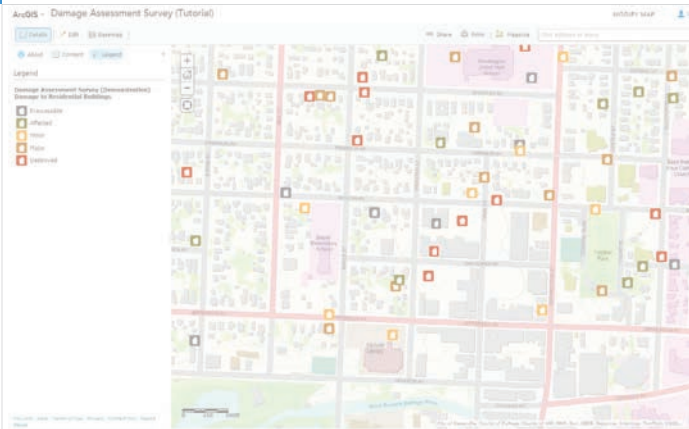
Once you have developed your list of GIS needs, it is time to determine what access you have to GIS resources, including data, software, training, and expertise. This will provide you with an idea of what you need to bridge the gap between existing and needed resources.

Go to the Resources page at www.napsgfoundation.org for more information on how to build a public safety GIS strategic plan.

- Print out your data/application matrix from the web tools.
- Prioritize applications (needs).
- Start small (quick wins).
- Develop a long-term plan (vision and sustainability).
- Socialize your plan with your team—both internal and external stakeholders.

Using GIS for Fire/Public Safety

- Consider your requirements in the context of your jurisdiction's GIS program.
- Look for common priorities among other government agencies and focus on opportunities to leverage existing resources.
- Look for ways to help outside agencies by sharing your GIS work.



Damage assessment using Collector for ArcGIS.

Effective Collaboration = Improved Outcomes

Checklist for Using a GIS

Building a Fire/Public Safety GIS

Once you have designed your implementation plan and know what you have to work with, you are ready to move toward implementing and using GIS.

- Software—Acquire the appropriate GIS software to meet immediate and long-term needs.
- Training—Build the technical capacity of existing staff.
- Data—Find and assemble the data and information.
- Making a map—Build your GIS project and develop products.

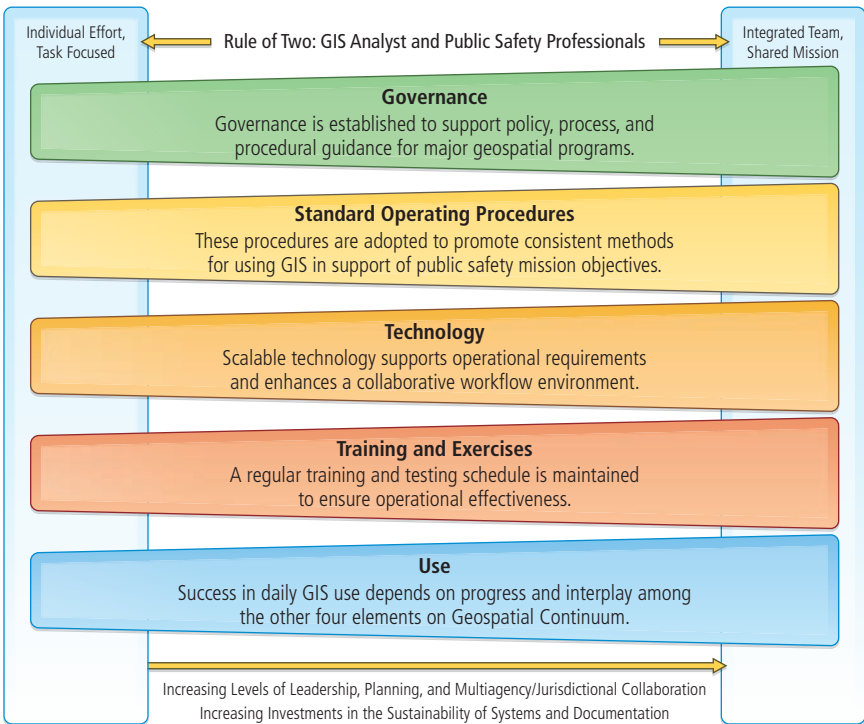


Leverage geographic information to analyze risk; develop pre-incident plans; and improve response activities that protect human life, property, and natural resources in your community.

Managing GIS for Fire/Public Safety

Public Safety Geospatial Continuum

Geospatial Continuum is designed to assist emergency response agencies and policy makers in planning and implementing effective public safety GIS solutions. It provides an outline of the five key variables needed for successfully deploying GIS to support the public safety mission.



Good Governance Is Key

- Demonstrate benefits and return on investment (ROI).
- Develop next-step projects.
- Gain support and feedback.
- Begin to institutionalize GIS throughout the department.

Review the GIS Standard Operating Guidance for Multi-Agency Coordination Centers template on the NAPSG website as an example of what you need to include in your local GIS governance policy.

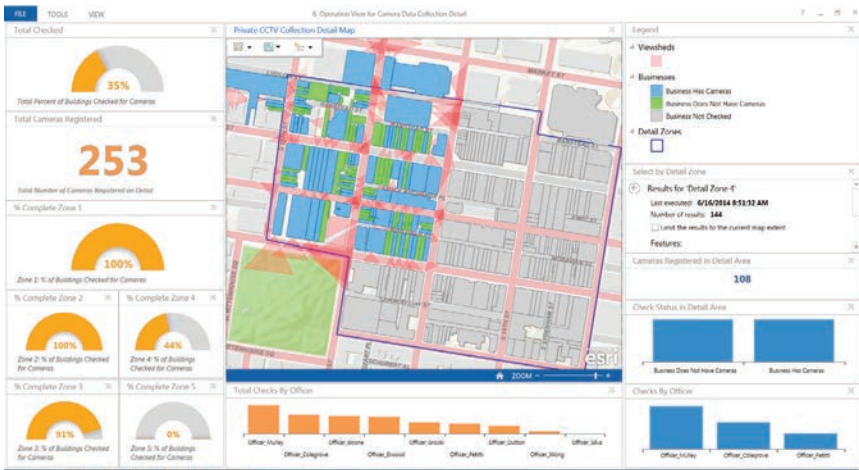
Checklist for Managing GIS

Building a Fire/Public Safety GIS

The last step in building a GIS is to put a plan in place for ongoing maintenance.

Here is a checklist of the basic functions for maintaining your GIS:

- Data management—Current and new data
- Building capacity—GIS acquisition, training, and support
- Standard operating procedures—Rules of use in your agency and for mutual aid and information sharing
- System maintenance—Keeping your technology up-to-date



Get a comprehensive view of activities affecting your organization, including live feeds and automated alert tools using Operations Dashboard for ArcGIS.



The National Alliance for Public Safety GIS Foundation

Establishing Excellence in Public Safety GIS

Education and Training • Regional Coordination •
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Technical Assistance • Policy Research and Guidance



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This booklet is made available through public safety partnerships in the National Alliance for Public Safety GIS Foundation.

To request additional copies of this booklet or to learn more about NAPSG promoting public safety GIS best practices, standards, and training, visit www.napsgfoundation.org.