

Virtual Training

Enhancing Mission Critical Decision Making: Understanding Core Information Requirements

October 26, 2017

National Alliance for Public Safety GIS (NAPSG) Foundation

napsfoundation.org | [@napsfoundation](https://twitter.com/napsfoundation)

Agenda

- 2:00pm Welcome and Background
- 2:05pm Training Overview
- 2:10pm Common Framework for Defining Core Information Requirements
- 2:30pm National Flood Core Information Requirements
- 2:55pm Questions and Answers

All questions will be handled through the Questions feature in WebEx.
Materials and a recording of today's training will be available on our website.

About NAPSG Foundation

- National Alliance for Public Safety GIS (NAPSG) Foundation
 - 501(c)(3) Non-profit organization established in 2005
 - +23,000 members: Public Safety Officials, Operators, and GIS Staff
 - Board of Directors comprised of public safety & emergency management industry leaders
- Our vision is to provide resources and support necessary to equip responders and leaders with knowledge and skills to apply decision-support technology and data to change outcomes for survivors.



ICMA

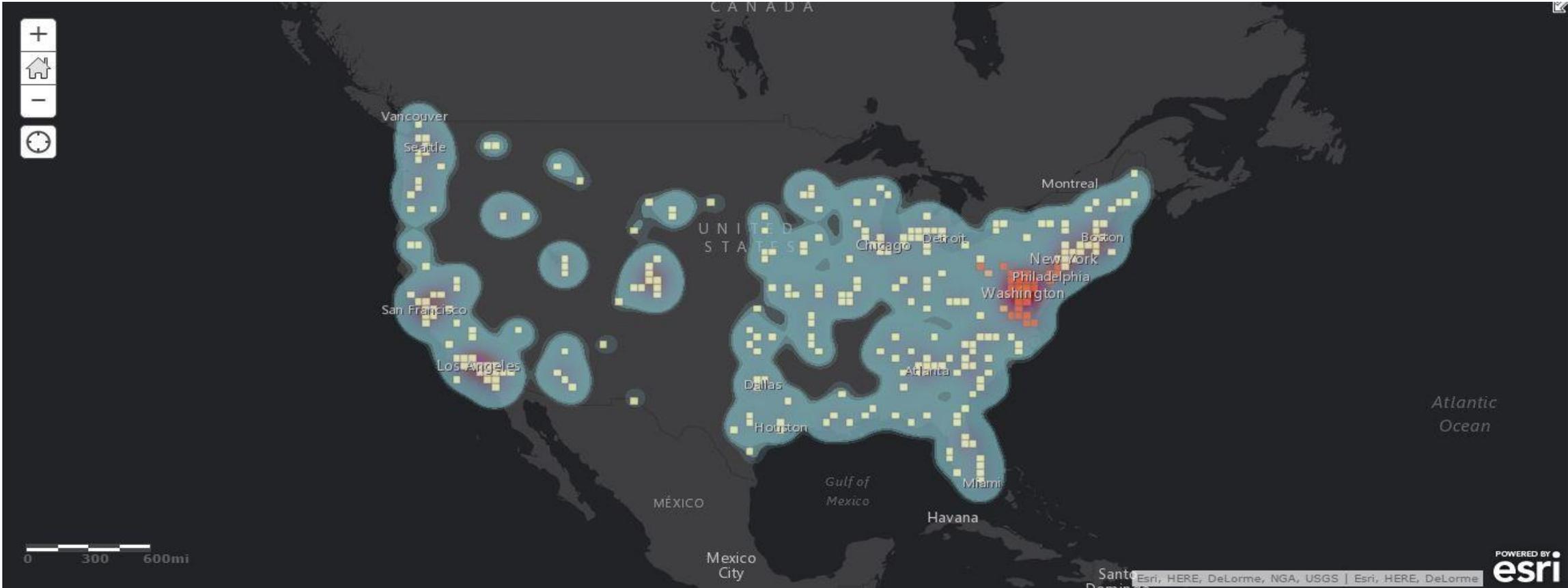


NACCHO
National Association of County & City Health Officials
The National Connection for Local Public Health



Where We Come From

23,000+ National Member Network



Training Purpose and Objectives

Gain awareness level knowledge on the process and national baseline for defining core information requirements to support mission critical decision making.

- Learn about a common framework for developing your agency's core information requirements, starting with the decisions you make in routine incidents and larger-scale disasters.
- Gain insight on national core information requirements for mutual aid consistent for all hazards and threats.
- Learn about the national flood-specific core information requirements.
- Develop strategies for communicating your information needs to GIS staff and technologists, so they can provide you with the most effective decision support tools and solutions.
- Contribute feedback and ideas to further refine NAPSG Foundation's work on core information requirements for mutual aid decision making.

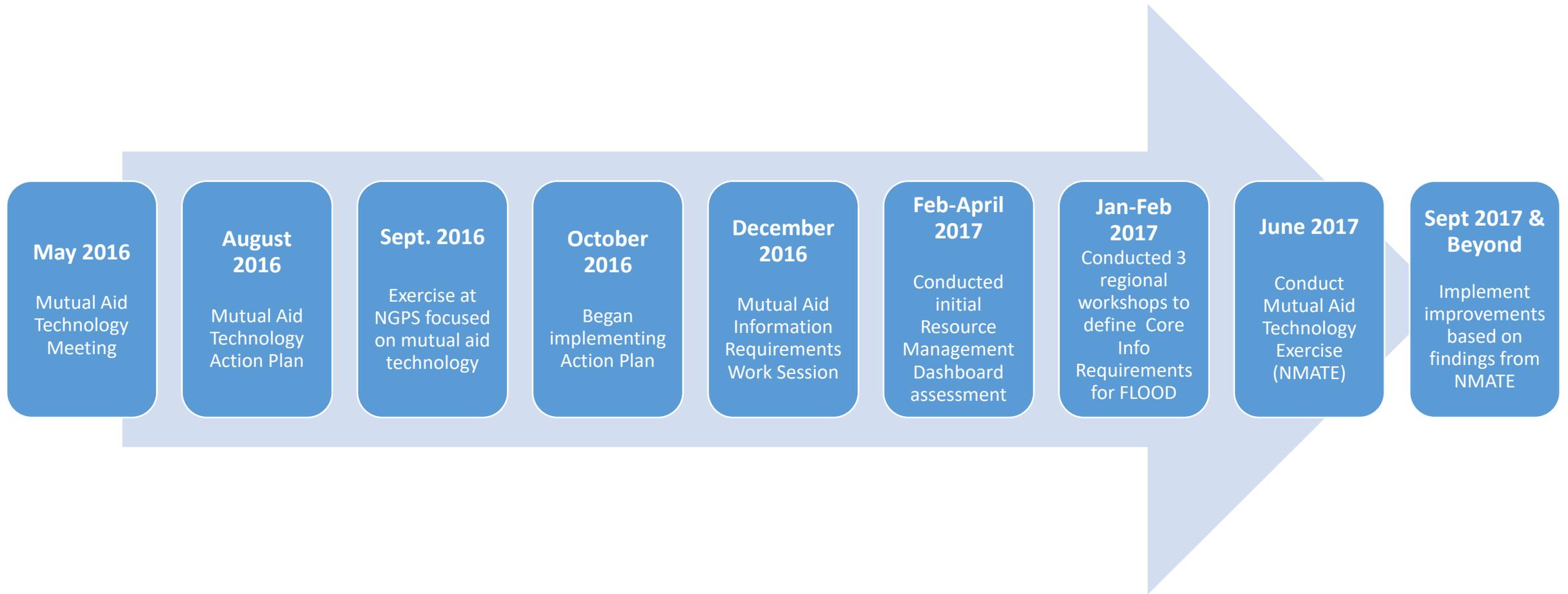
Instructor Introductions

- Rebecca Harned, Director National & Federal, National Alliance for Public Safety GIS Foundation
- Carla Boyce, Director, National Alliance for Public Safety GIS Foundation

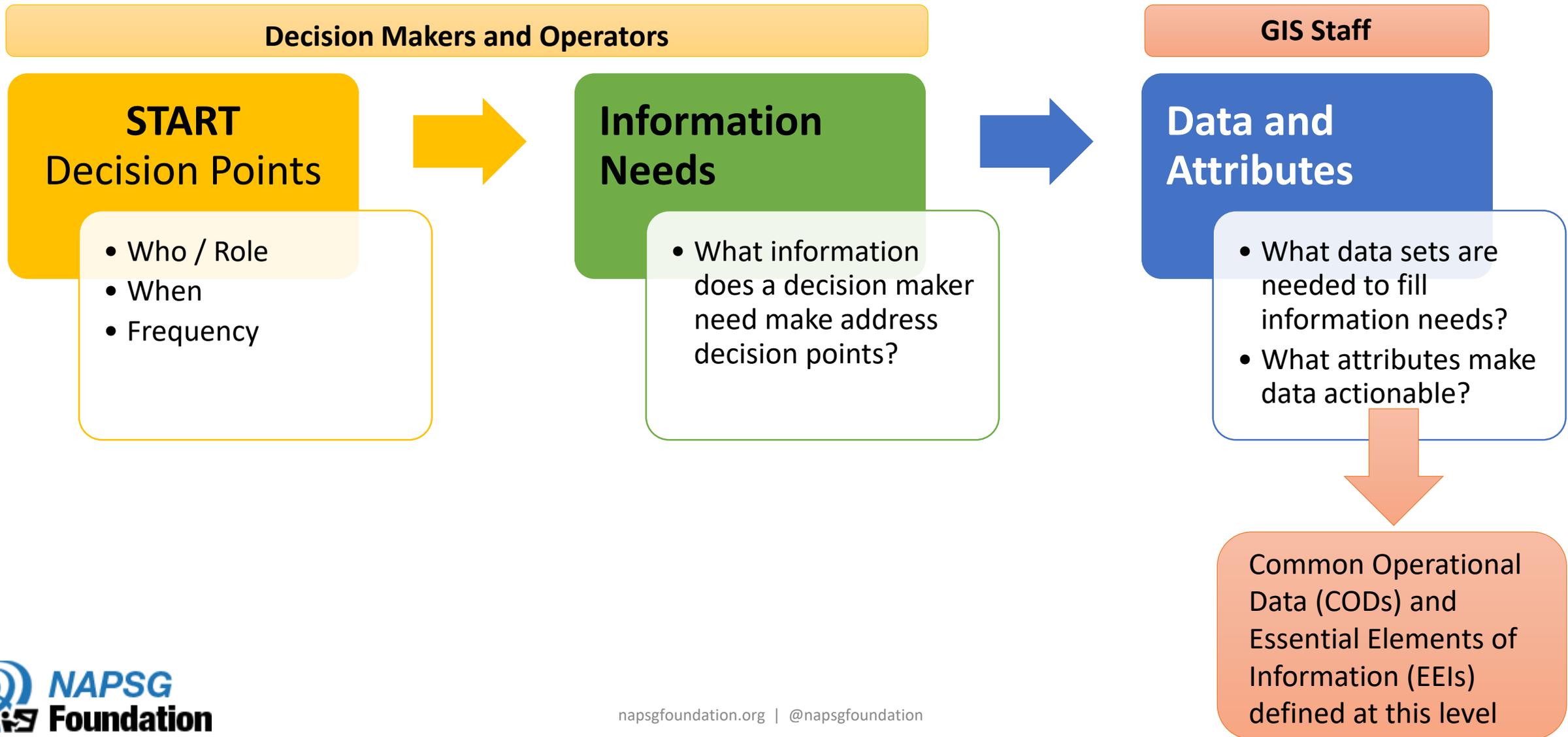
Common Framework for Defining Core Information Requirements

Rebecca Harned

Background



Basic Framework

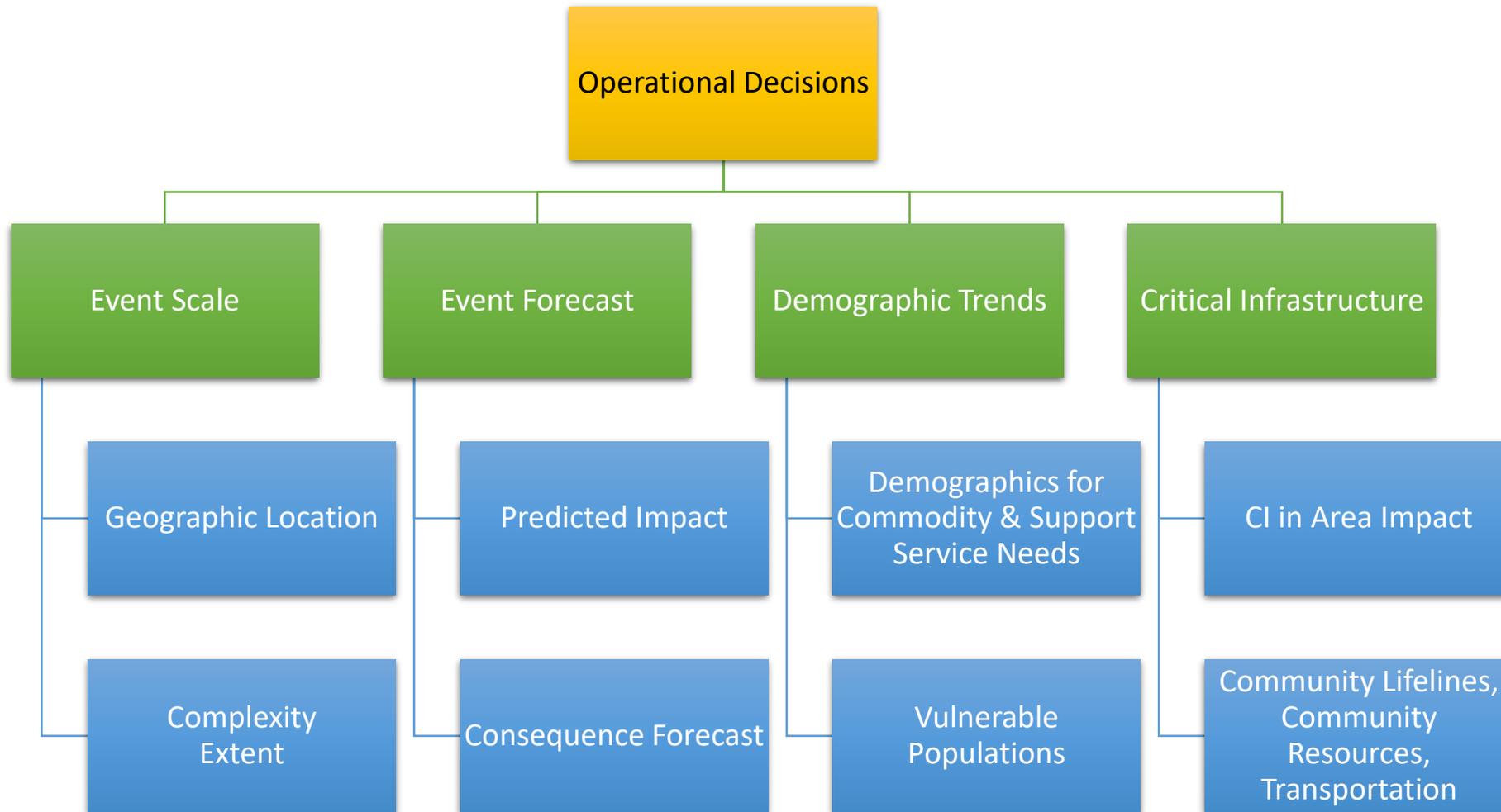


Core Information Requirements for Mutual Aid

What information do you need for effective decision making in an event requiring mutual aid?

- **Situational Awareness Information:** Information requirements necessary for general decision making throughout the lifecycle of an event. For events requiring mutual aid, event specific information should be shared by affected communities to entities providing (or considering providing) resources/capabilities in support of response and/or recovery efforts.
- **Resource Information:** Information requirements about resources or capabilities being requested or offered during an event requiring mutual aid support. This information may be needed prior to, during, or after an event.
- Necessary to define time-bound information requirements, prior to determining which EEs at a data and attribute levels can be used to fill information requirements

Situational Awareness Requirements Flow



Situational Awareness Information Requirements

Situational Awareness Information Point	Description
1. Event scale	This point refers to event complexity, extent, and general location. It is an initial information point needed as soon as available, even if it is a preliminary determination of event location and extent based on best available data or just-in-time/predetermined planning assumptions immediately following an incident.
2. Event forecast/prediction	For notice events, such as hurricanes and planned events, assumptions and predictions are commonly used to assess event magnitude and severity. This includes forecasting consequences to areas directly affected and potential cascading consequences to/from neighboring communities.
3. Event magnitude	For both notice and no-notice events, magnitude is generally assessed within 0-12 hours of initial incident. By about 24 hours, the magnitude of the event has typically been ground-truthed and decision makers are provided with updated consequence analysis.
4. Demographic trends	Key demographic indicators within affected areas are critical information points for both notice and no-notice events. Demographic information for aiding decision making is not just basic population and number of households data. This information must go deeper to include trends and other factors such as primary languages spoken, socio-economic/income brackets, populations with access or functional needs, transportation dependencies, and analysis of commodity and support service requirements based on demographic trends.
5. Critical Infrastructure Impact	No later than 24 hours post incident, decision makers need to be provided with information regarding effects on critical infrastructure. This specifically relates to impacts on community lifelines such as: transportation infrastructure, electricity, communications, health systems, potable water, sewer/sanitation, and others. Updates to this information should be provided on a regular basis, but updated once a day minimally or as additional information becomes available.



Example CODs or EEI for Situational Awareness

Event Scale	Event Forecast & Magnitude	Demographic Trends	Critical Infrastructure
Geographic location or area	Event magnitude or severity based on point-in-time information <ul style="list-style-type: none"> • Often requires frequent updates as even evolves 	Social Vulnerability such as the CDC Social Vulnerability Index	Community Lifelines <ul style="list-style-type: none"> • Electric Power Generation • Wastewater Treatment • Drinking Water facilities • Communications infrastructure w/ status
Impact area of event based on point-in-time information <ul style="list-style-type: none"> • Often requires frequent updates as even evolves 	Modeling outputs on event forecast or prediction based on type of event, i.e. <ul style="list-style-type: none"> • Storm Surge • HazUS • CAMEO/Aloha 	Population Demographics <ul style="list-style-type: none"> • Number of Households • Age brackets • Languages spoken • Socio-economic brackets 	Emergency Resources <ul style="list-style-type: none"> • Hospitals w/ status and bed availability • Fire Departments w/ status • Police Stations w/ status • Pharmacies w/ status
	Types of households/residential homes in impacted area, i.e. <ul style="list-style-type: none"> • Single family • Mobile home parks Type and extent of commercial or industrial facilities in impact area	Special Populations <ul style="list-style-type: none"> • Access & functional needs • Transportation dependencies • Nursing Homes • Day Cares 	Repeat and tailor for each ESF or infrastructure category

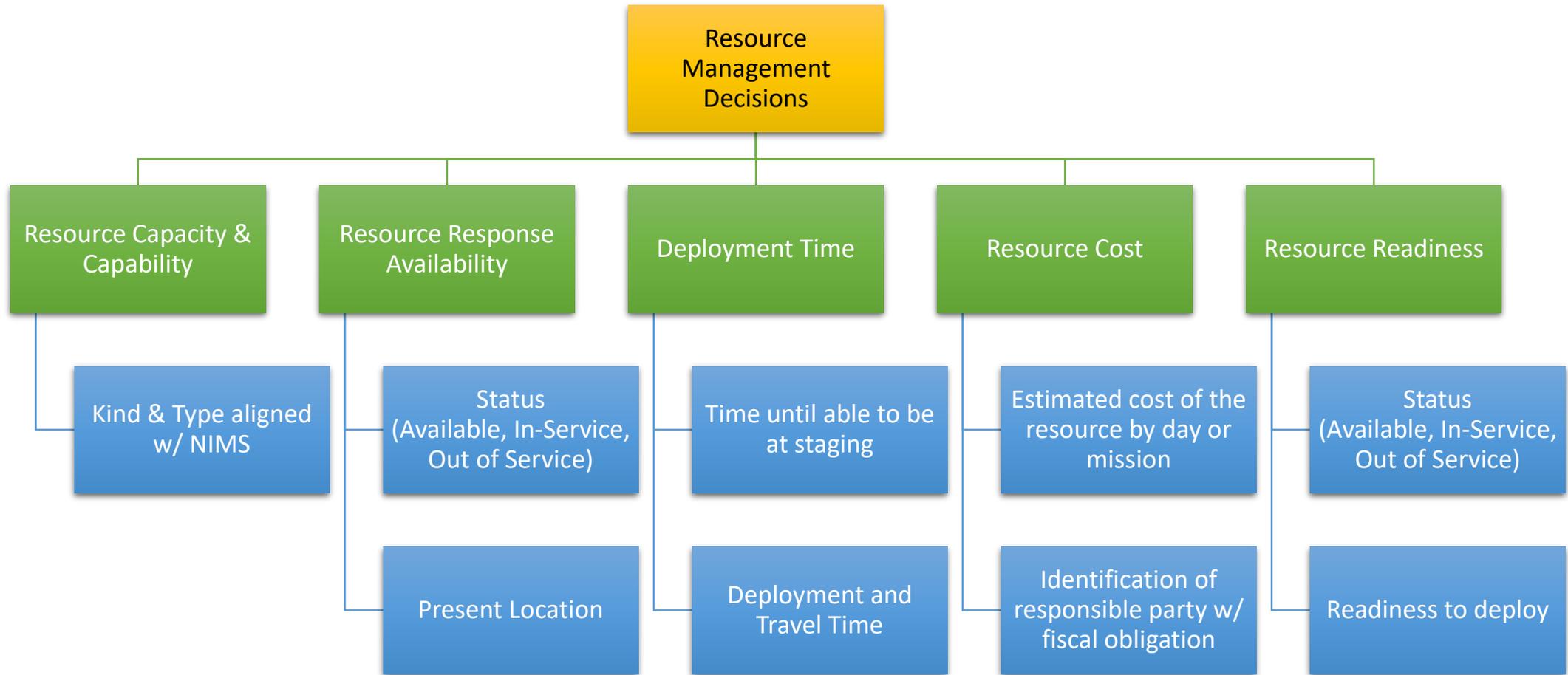
Basic Framework for Resource Information

- **C - Capability** (what you need it to do)
- **S - Size** (physical size descriptor)
- **A - Amount** (how many you need)
- **L - Location** (where it will be delivered)
- **T - Type** (NIMS Type or what it is)
- **T - Time** (when do you need it and for how long)

Time Thresholds

- Intrastate Mutual Aid: 0-12 hours
- Interstate Mutual Aid: 24+ hours
- National Mutual Aid: 48+ hours

Resource Management Requirements Flow



Resource Information Requirements

Resource Information Point	Description
1. Resource kind/type	The most critical information point resource requestors need to know when assessing if a resource can fulfill the necessary capability is the resource kind & type. This information should be consistent with NIMS resource typing definitions. Additionally, this information should be maintained by resource owners as an integral component of their preparedness efforts, which facilitates readiness. This information should be available prior to an event and is required within 0-12 hours from initial incident.
2. Resource response availability	The next most important information point for resource requestors is the response availability of a given resource. This relates to determining if the resource is fully available now and for what type/level of mutual aid.
3. Deployment time	This information point is critical for resource requestor to select/accept a given resource. The requestor needs to know how long (or how fast) it will be until the resource arrives at staging and can be employed in operations. This point includes variables associated with time to deployment and travel time to the assigned area.
4. Resource cost	The estimated cost of a resource and identification of “responsible party” with fiscal obligation to pay for the resource is also a key information point requestors need prior to accepting a resource.
5. Resource readiness	Status of a resource and its readiness to deploy is also a critical information point for requestors. They need to know if a resource is already deployed, available for request, in-service, out of service, etc. This is information needed in the first 0-12 hour operational period in order to determine which resources to request and/or offer for potential deployment. In the case of forecasted noticed events, resource readiness information should be pre-determined.



Live Demo: Guidance on Resource Management Dashboards

Guidance on Resource Management Dashboards

National Guidance    

1 Introduction

The purpose of this Guidance is to provide a consistent framework and functional specifications for developing and using location-enabled dashboard technology to support resource management.

This Guidance on Resource Management (RM) Dashboards was designed to support all public safety disciplines and all types & scales of incidents. Example RM Dashboards are provided for several disciplines in order to illustrate how the consistent framework can be applied to different missions.

This Guidance was developed with input from local first responders and

2 Decision Support Tools for Resource Management

3 Pathway to Decision Making

4 Basics of Resource Management Dashboards

5



Guidance on Resource Management Dashboards

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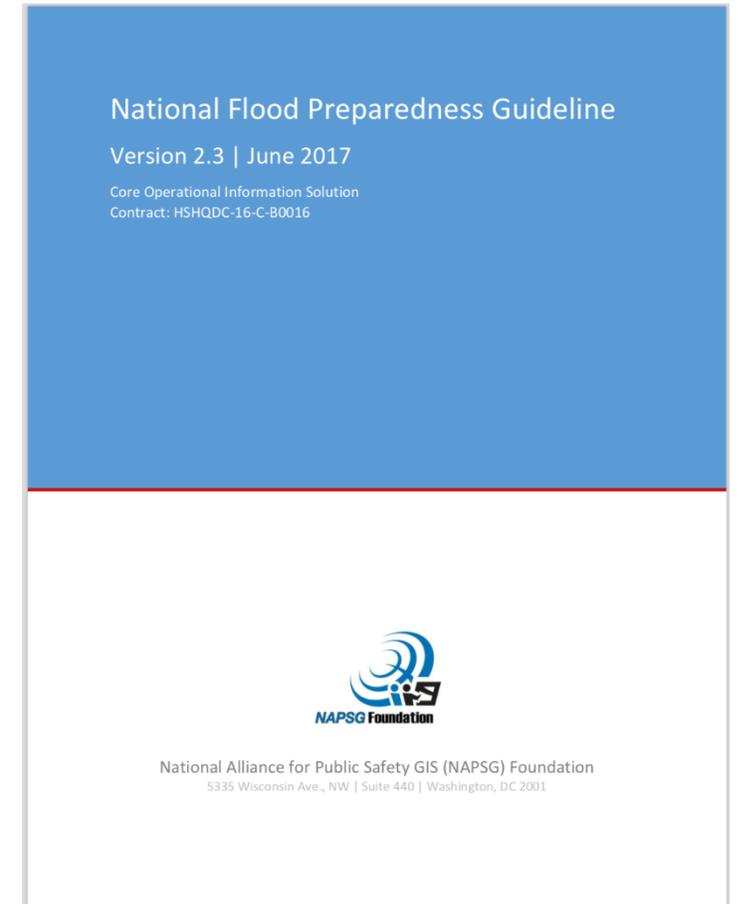
Photo courtesy of the Federal Emergency Management Agency

National Flood Core Information Requirements

Carla Boyce

Flood Preparedness and Resilience

- National Flood Preparedness Guideline v2.3
(JUNE 2017)
 - Changing Outcomes by Getting Actionable Information to the Right Person at the Right Time
 - Building Trust and Confidence in the Data
 - Identifying, Employing, and Managing Resources



<http://bit.ly/2yJg54j>

Actionable Information and Changing Outcomes

Information delays, especially during flash flood events, put lives at risk

- Increasing the speed at which credible and actionable information gets in the hands of decision-maker's is vital to saving lives
 - Predictive modeling (HAZUS, National Water Model)
 - Promotes understanding of flood risk and potential consequences
 - Supports identifying likely resources and mutual aid thresholds
 - Integrated sensors
 - Consider partnering with USGS, NOAA, and others to enhance local sensor networks
 - Explore emerging low-cost sensor technology to supplement or grow existing networks
 - Incorporate social media and the crowd/citizens as sensors for flood resilience
 - Identify, document, train, and exercise triggers to drive action
 - Pre-planned information products, including information hubs and resource management dashboards

Predictive Modeling: HAZUS (FEMA)

- Free GIS Modeling Tool
 - <https://www.fema.gov/hazus>
- Allows planners / practitioners to explore a wide range of flood hazard analyses, including:
 - Studies of specific return intervals of floods (e.g., 100-year return interval).
 - Studies of annualized losses from flooding.
 - Quick Look assessments allow users to evaluate potential flooding from specific flood depths at specific locations.
 - Scenario analysis allows users to evaluate consequences of specific actions, such as the introduction of flow regulation devices, acquisition of flood-prone properties and other mitigation measures.
- Flood loss estimation methods consists of two modules that carry out basic analytical processes:
 - Flood hazard analysis and flood loss estimation analysis.
 - Flood loss estimation module calculates physical damage and economic loss from the results of the hazard analysis.

Predictive Modeling: National Water Model (NOAA)

- Flood forecasting tool that analyzes data from over 8,000 U.S. Geological Survey (USGS) gauges across the country
 - <http://water.noaa.gov/about/nwm>
- Can simulate conditions for more than 2.7 million river reaches across the country's river network
 - creates forecasts for the entire network every hour
 - Previously, NOAA could only predict conditions for approximately 4,000 locations every few hours
- Emergency managers can use this information to better prepare for and respond to floods events
- Data from the National Water Model can be used across the nation to monitor potential short-range (0-15 hours) and long-range (0-30 days) flood event forecasts
 - providing targeted stream forecasting and supports more actionable decisions at the local level

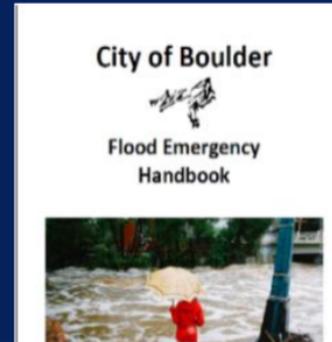
Sensors

- Networks of sensors like river gauges, cameras, and even social media supplement GIS and analysis efforts to prepare for and respond to flood events
- Managing, maintaining, and enhancing sensor networks and linking sensor information to GIS builds situational awareness
 - Well-maintained sensor networks and including sensor information in training and exercises increased confidence in data, which in turn strengthens data-driven decision making
- These sensor networks a key components for monitoring “triggers” that can drive timely action by those potentially affected and decision makers alike
 - Especially true in rapidly unfolding flash flood events
- Innovations in sensor technology – specifically smaller and lower costs sensors – increasingly provide jurisdictions alternatives to fill potential gaps
 - DHS S&T First Responders Group is partnering with the LCRA to perform research and development to build out a sensor system that can monitor and evaluate rapidly rising flood waters

Spotlight: Identifying and Documenting Triggers

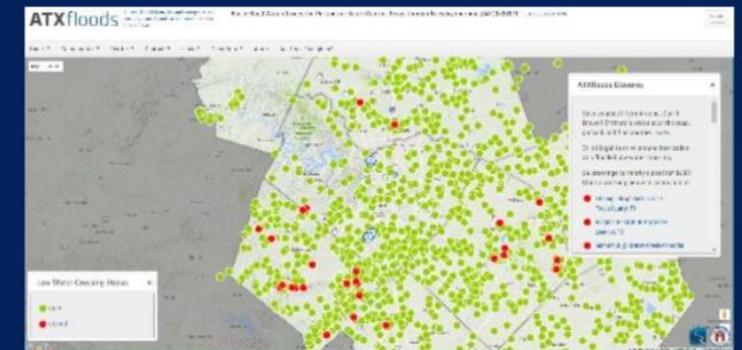
Spotlight: City of Boulder

The City of Boulder (CO) created the, “Flood Emergency Handbook” to document standard operating procedures. This includes “trigger” points for gauges, what the trigger means for the city, and when to expect water rise downstream. The Handbook also includes...
With known issues – like



Spotlight: City of Austin

The City of Austin maintains a listing of known lower-water crossings and common locations that “trigger” actions when activated. This data evolved into what is known as the ATXfloods website to help alert the community to flash flood hazards. [Visit the site to learn more!](#)



Information Hubs and Pre-planned Products

Spotlight: State of Louisiana

The Louisiana Governor's Office of Homeland Security & Emergency Preparedness provides an Online information sharing portal for partner Organizations. This site allows users to discover and contribute data to the system, both public and secure. [Visit the site to learn more!](#)



Spotlight: State of Iowa

The State of Iowa and the University of Iowa have created a public data portal to provide reliable and actionable flood data to the community. This data contains relevant metadata to assist with critical decision-making during a flood emergency. [Visit the site to learn more!](#)



Build Trust and Confidence in the Data

- Review historical information such as after-action reports and conduct post-incident analysis with an eye towards data and analytical needs
 - Include GIS software and staff in these efforts
- Refer to and provide metadata when using outside data feeds or providing data to others
 - Age of data, confidence levels, and limitations shape how we interpret or use data in critical decisions
- Communicate critical information using natural language and common location reference to reduce confusion, especially in multi-jurisdictional cross-discipline environments
 - Use everyday phrasing understood by the average person rather than terms that require definitions
 - Adopt & implement a common location language like the US National Grid (USNG)
 - <https://www.napsfoundation.org/all-resources/us-national-grid-resources-2/>

Build Trust and Confidence in the Data

- Build an information hub to manage and exchange data internally and externally
- Consider creating mission-focused applications on top of information hubs to quickly feed critical information to decision makers
 - Mission-focused (targeted) applications help sift through the “white noise” and put actionable information in context and mitigate information overload
- Use standardized symbology to bring clarity and common understanding
 - Incident Symbology Guideline and Symbol Sets - <https://www.napsgfoundation.org/all-resources/symbology-library/>
- Include use of location-enabled decision support tools in exercises to:
 - Promote familiarity with available tools and data
 - Test assumptions about the data and how it informs decisions
 - Foster data-driven decision making

Identifying, Employing, and Managing Resources

- Flooding can affect large geographic areas resulting in complex multi-jurisdictional cross-discipline resource management challenges (Harvey/Irma)
- Resource management tools can be employed to help estimate in near real-time resource requirements and availability, and communicate between agencies
- Key takeaways:
 - Implement NIMS resource management protocols and procedures
 - Build mission ready packages to fully understand supporting factors to sustain it through duration of incident (resupply/wrap-around services, costs, authority, staffing)
 - Employ a resource management dashboard to promote operationalizing resource management procedures day to day as well as during emergencies
 - Consider using freely available tools like FEMA's IRIS and the Resource Typing Library Tool (RTLTL) to type and inventory resources
 - Consider implementing systems like IAFC's National Mutual Aid System or EMAC's MASS

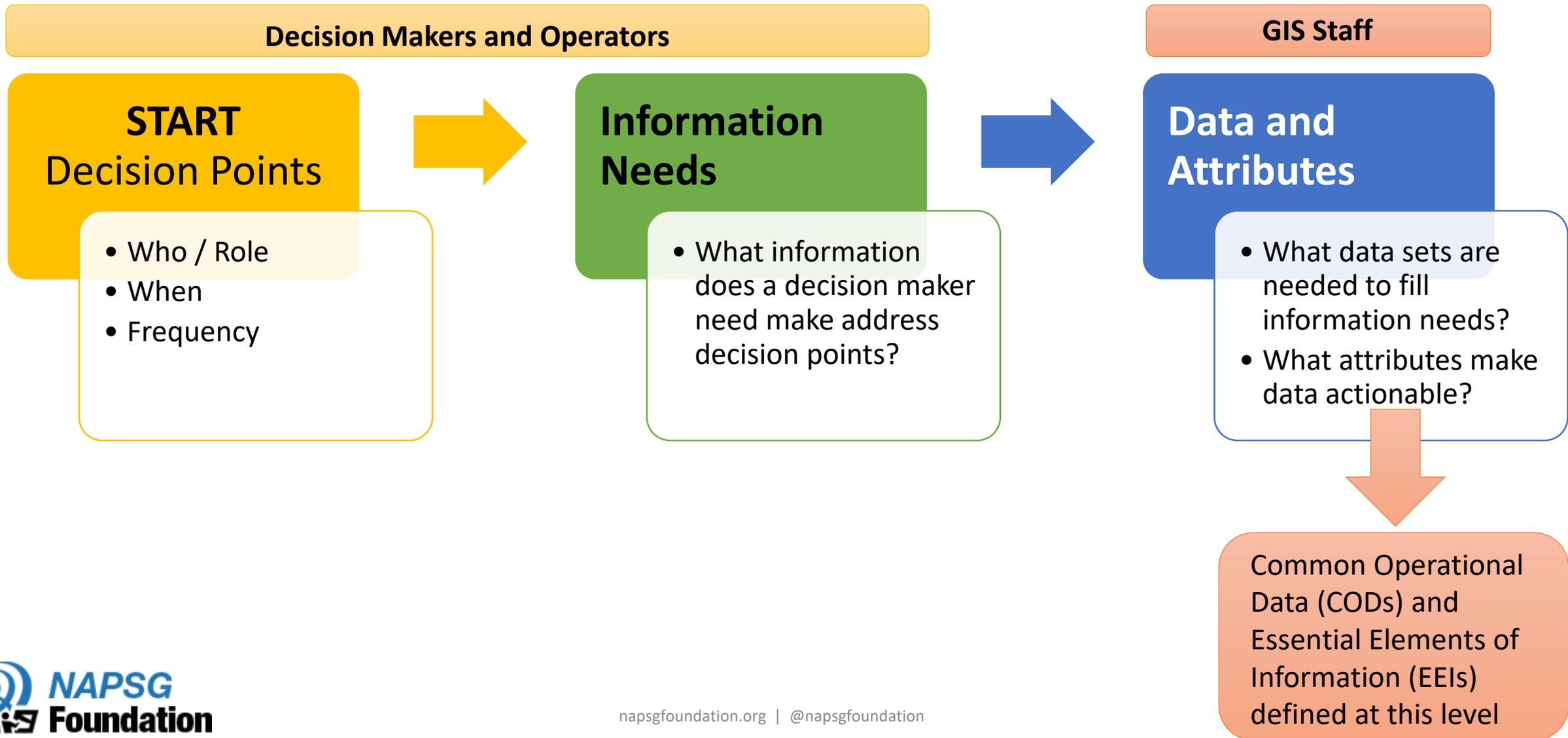
National and Federal Systems

- FEMA addresses resource management through the National Incident Management System (NIMS)
- To foster standardization, FEMA provides the Incident Resource Inventory System (IRIS)
 - No-cost distributed software tool that allows agencies to identify & inventory their resources, consistently with NIMS resource typing definitions, for mutual aid operations
 - Fosters consistency and standardization in the inventorying of resources
- EMAC governs the nation's state-to-state mutual aid during Governor-declared states of emergency
- EMAC provides guidelines and templates for building Mission Ready Packages (MRPs)
 - Includes standardized language and tools, to help agencies categorize and identify commodities, personnel, and equipment
- For more information on these federal systems, please see:
 - NIMS: <https://www.fema.gov/national-incident-management-system>
 - IRIS: <https://rtlt.preptoolkit.fema.gov/Public/Home/LinksTools>
 - EMAC: <https://www.emacweb.org/>
 - MRPs: https://www.emacweb.org/training/mrp_excel/index.html
 - IAFC's National Mutual Aid System: <http://bit.ly/2yPv0vJ>

National Flood Preparedness Guideline (Guideline) – Next Steps

- Conduct two pilots designed to:
 - Assist local jurisdictional in enhancing flood preparedness and operational readiness
 - Promote knowledge transfer and operationalize practical flood preparedness solution sets
 - Validate and inform updates to the National Flood Preparedness Guideline
- Complex flood scenario driven pilots scheduled for winter 2018 in:
 - Charleston, SC
 - Boulder City, CO
- Revised Guideline (late Spring 2018)
 - Pilots and public engagement inform revisions
 - ***Plan to provide comments and feedback!***

Take Away Message



Supporting Resources and Weblinks

1. Draft Guidance on Resource Management Dashboards - <http://arcg.is/0rf1TX>
2. National Flood Preparedness Guideline - <http://bit.ly/2yJg54j>
3. HazUS for Natural Hazard Modeling (including flood) - <https://www.fema.gov/hazus>
4. USNG - <https://www.napsgfoundation.org/all-resources/us-national-grid-resources-2/>
5. Incident Symbology Guideline and Symbol Sets - <https://www.napsgfoundation.org/all-resources/symbology-library/>
6. NIMS - <https://www.fema.gov/national-incident-management-system>
7. IRIS - <https://rtlt.preptoolkit.fema.gov/Public/Home/LinksTools>
8. EMAC - <https://www.emacweb.org/>
9. IAFC's National Mutual Aid System - <http://bit.ly/2yPv0vJ>

Questions?

Rebecca Harned – rharned@publicsafetygis.org

Carla Boyce – cboyce@publicsafetygis.org