

# Innovations in Resource Management and Mutual Aid Technology



*Powered by NAPSG Foundation*

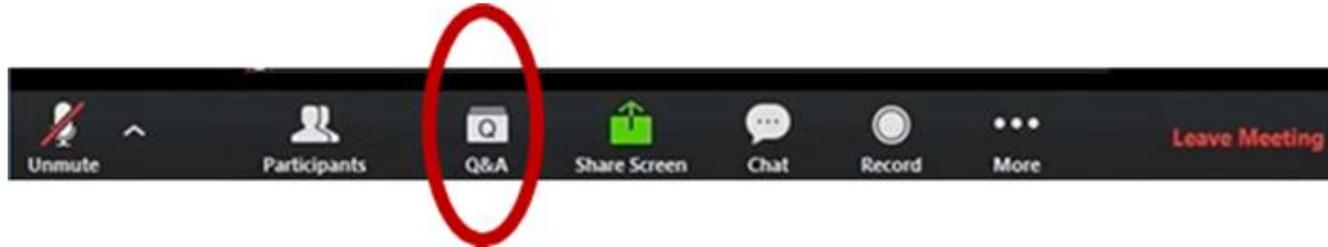
July 22, 2021

National Alliance for Public Safety GIS (NAPSG) Foundation

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

# Webinar Prep

- Due to the large attendance, all participants are muted for the duration of the session to prevent background noise.
  - Please use the Q&A functionality within Zoom for questions that are relevant to the whole group.
  - We will address these Q&A at the end of the webinar!



# Today's Objectives

- Learn about FEMA's National Resource Hub and how to gain access and start using the suite of resource management tools.
- Gain insight into how the National Resource Hub can connect and share data with your other incident management systems, situational awareness apps, and other 3rd party systems today and in the future.
- Learn what is in development to improve existing and innovate with new resource management and mutual aid technology tools and systems.
- Find out what's new in version 3.0 of the Implementation Guide on Information Sharing Standards and how you can use the guide in informing your agency's technology selection and acquisition process to ensure interoperability and seamless information sharing.
- Gain basic technical knowledge on the latest with the Emergency Data Exchange Language (EDXL) and how it supports building a National – and Global – network of interoperable incident management systems.

# Agenda

- 2:00pm Introductions and Overview
- 2:10pm National Resource Hub
  - What It's About
  - What It Can Do For You and Your Agency
- 2:25pm What's Coming in the Job Aid and Technical Guidance for Incident Management Technology
- 2:35pm Know the Basics on EDXL and Why it Matters
- 2:55pm Actions & Next Steps
- 3:00pm Adjourned

# Hosts and Panelists

- Charlotte Abel, *Strategic Manager, NAPSG Foundation*
- Harmon Rowland, *Section Chief, FEMA National Integration Center*
- Rebecca Harned, *Vice President, 4 Arrows Consulting, Inc.*
- Elysa Jones, *Chair, OASIS Emergency Management Technical Committee*

# About NAPSG Foundation

## Our Vision

A Nation of emergency responders and leaders equipped with the knowledge and skills in applying technology and data to change the outcome for survivors.

- 501(c)(3) Non-profit organization established in 2005
- +20,000 member network: Public Safety leaders, first responders, and GIS practitioners
- Board of Directors comprised of public safety & emergency management industry leaders



ICMA



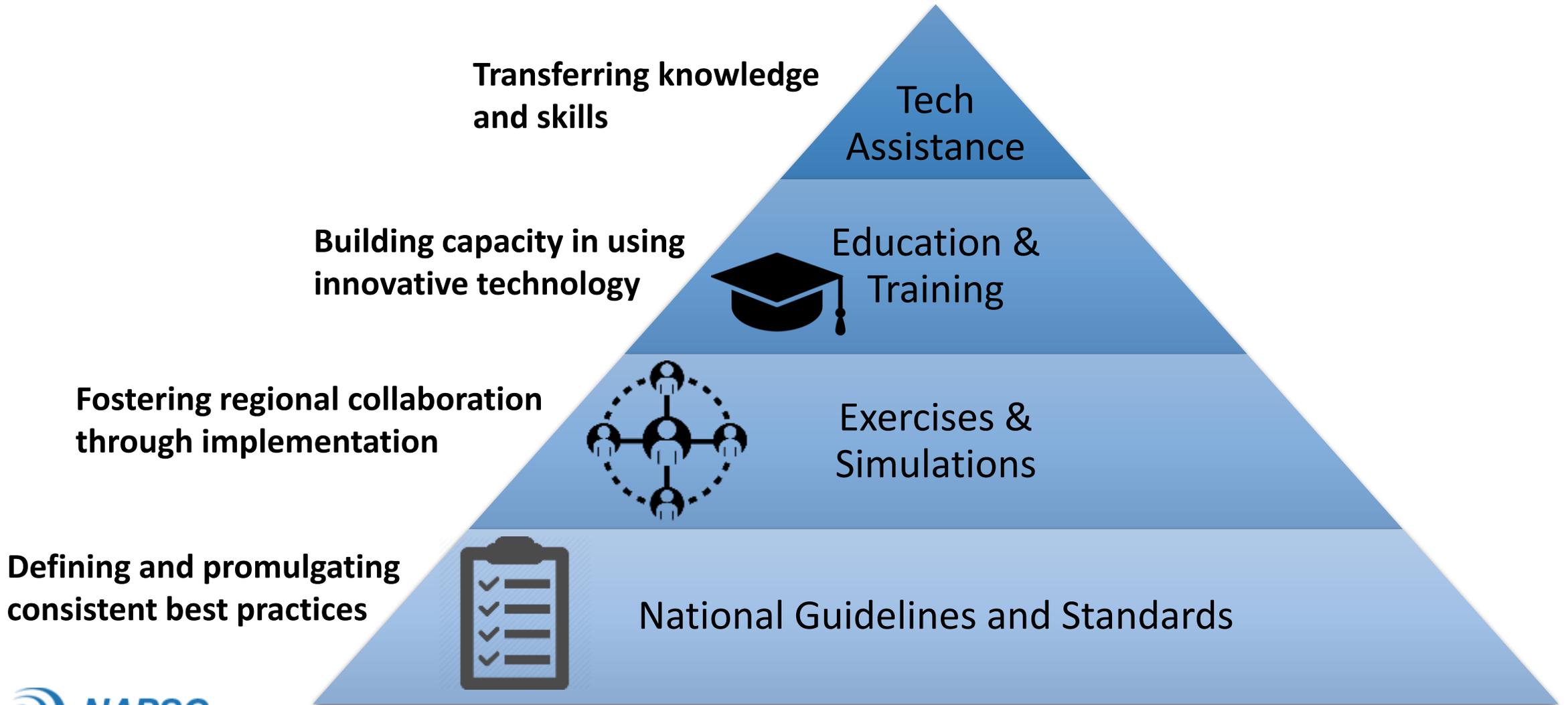
NACCHO  
National Association of County & City Health Officials  
The National Connection for Local Public Health





Decision Makers and First Responders need access to right actionable information at the right time.

# How Do We Do It



# Resource Library

The screenshot shows the NAPSG Foundation website's Resource Library page. At the top, there is a navigation bar with the NAPSG Foundation logo and menu items: HOME, ABOUT US, WORK WITH US, RESOURCES (highlighted), EVENTS, and NEWS. Below the navigation bar, the page is divided into two main sections. On the left, under the heading "RESOURCES", there is a welcome message: "Welcome to NAPSG's Resource Library. Here you can access all of the key resources that NAPSG makes available to the community at no cost, to support you and your agency in advancing the use of location-enabled decision support tools." Below this is a paragraph explaining the organization: "The Resource Library is organized by resource category. Simply click on the Category of interest and begin exploring available resources. You can also search for resources by entering-in a keyword into the search box in the upper right hand side." On the right, under the heading "SEARCH RESOURCES", there is a search interface with a dropdown menu set to "All Categories", a text input field, and a "SEARCH" button. Below these sections is a grid of eight resource categories, each with an icon and a label: "Best Practices and Standards" (blue checkmark icon), "Education and Training" (graduation cap icon), "Event Proceedings and Materials" (calendar icon), "Qualifications and Credentialing" (certificate icon), "Guidelines and Templates" (clipboard icon), "Symbol Library" (diamond icon), "US National Grid Resources" (US map icon), and "Safe & Resilient Toolkit" (toolbox icon).

**NAPSG Foundation** HOME ABOUT US WORK WITH US **RESOURCES** EVENTS NEWS

## RESOURCES

Welcome to NAPSG's Resource Library. Here you can access all of the key resources that NAPSG makes available to the community at no cost, to support you and your agency in advancing the use of location-enabled decision support tools.

The Resource Library is organized by resource category. Simply click on the Category of interest and begin exploring available resources. You can also search for resources by entering-in a keyword into the search box in the upper right hand side.

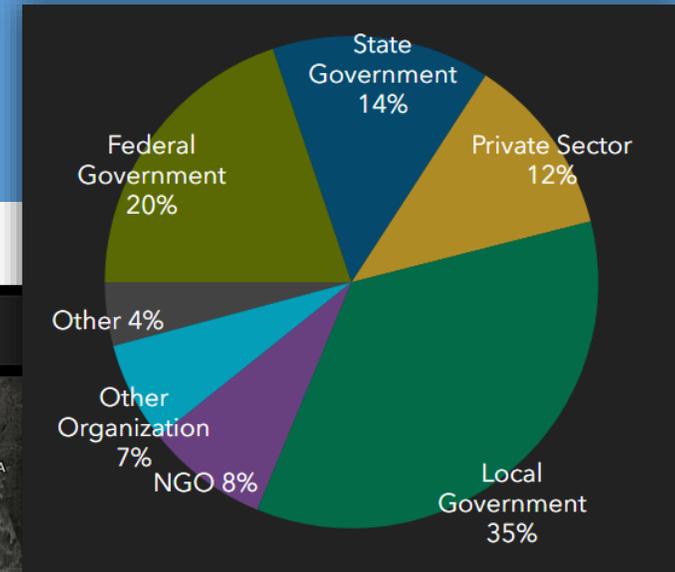
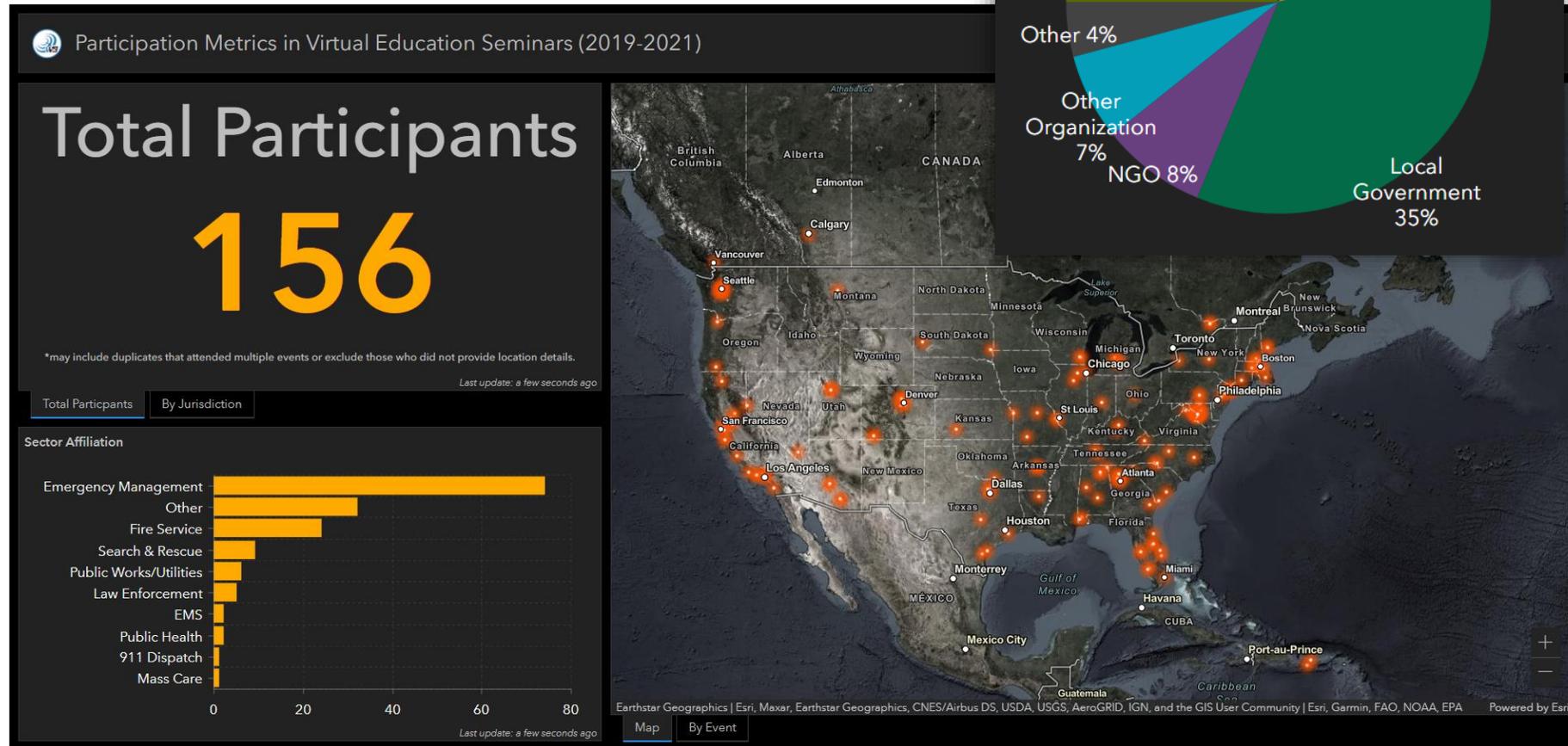
## SEARCH RESOURCES

All Categories

- Best Practices and Standards
- Education and Training
- Event Proceedings and Materials
- Qualifications and Credentialing
- Guidelines and Templates
- Symbol Library
- US National Grid Resources
- Safe & Resilient Toolkit

# Local Focus – National Reach

- 20,000+ member network
- 12 primary national & international associations
- All disciplines
- All levels of government
- Private sector



Virtual Training participants with contact details redacted.

# Background: Innovative Resource Management and Mutual Aid Policy & Technology

- **Goal:** Build from lessons learned in recent incidents and exercises to address some of the most pressing needs and requirements around the fusion of incident management policy, technology, and information sharing.



# History



**Winter 2017**

Mutual Aid Information Requirements Report Released

**Summer 2017**

Conducted National Mutual Aid Technology Exercise (NMATE) & Issued After-Action Report

**March 2018**

Conducted Crisis Management Technology Meeting following 2017 disasters

**May 2018**

Conducted Workshop on Frameworks for Whole Community Information Sharing

**April 2019**

Conducted the first National Resource Management Summit

**Fall 2019**

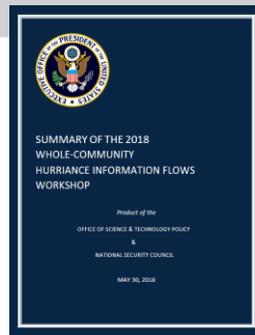
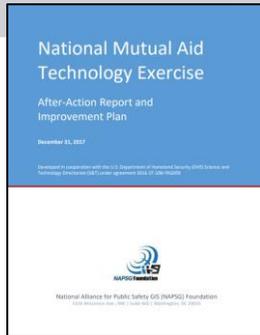
Conducted NMATE and released the Mutual Aid Interoperability Action Plan

**Winter 2019**

Launched the FEMA NCG Technology Sub-group and the NIMS Technology Roles & Functions Study

**January 2021**

Released preliminary results from the Resource Management Maturity Study Report



# Incident Management Policy and Technology Coordination

- Inaugural National Resource Management Summit (NRMS) - 2019
  - 18 agencies across the nation, plus FEMA NIC and DHS S&T
- Bi-Annual National Mutual Aid Technology Exercise (NMATE) - 2019
  - 14 agencies with 24 different resource management / mutual aid systems
- NCG Technology Sub Group -2019-Ongoing
  - 15+ agencies represented, plus FEMA, DHS S&T, CISA, and US Forest Service
  - Define Technology-Related Roles within NIMS Structures
  - Resource Management Maturity Study
  - Guidance on Virtualizing EOCs
- 2<sup>nd</sup> National Resource Management Summit – 2021
  - 35 stakeholders across the nation, plus FEMA, DHS S&T, US Forest Service

## National Mutual Aid Technology Exercise 2019 Summary of Findings

### Exercise Logistics

Dates: August 21-22, 2019

Location: State of Kentucky Emergency Operations Center, Frankfort, KY

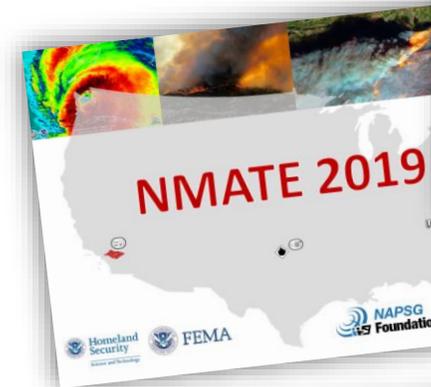
### Exercise Goal

Demonstrate and exercise policy and technology interoperability among crisis management and mutual aid systems, through seamless exchange of priority resource management information.

### Key Findings

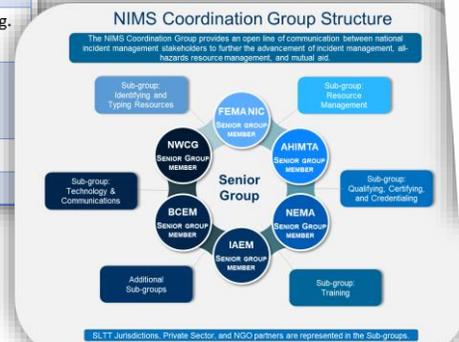
- ✘ Current resource management policy and technology initiatives across the nation are not well coordinated and aligned, resulting in disparate policies and technologies that are not interoperable, and operational challenges.
- ?
- How do we unify and streamline resource management policies and technologies to achieve better coordination and smoother operations during incidents requiring mutual aid?
- 💡 Need a nation-wide strategy and course of action to unify resource management and mutual aid policy, technology, and operations.

[https://www.napsgfoundation.org/wp-content/uploads/2019/10/NMATE\\_Findings\\_Summary\\_20191018.pdf](https://www.napsgfoundation.org/wp-content/uploads/2019/10/NMATE_Findings_Summary_20191018.pdf)



### Near-Term Goals (3-6 Months)

- Coordinate the establishment of the NIMS Coordinating Group
- Conduct first in-person meeting of the NCG to establish MOU with stakeholders (target Aug. 2019)
- Plan and conduct the Mutual Aid Technology Exercise to determine the current state of interoperability among existing resource management and crisis management systems to seamless share and exchange resource information
- Finalize NCG MOU and define strategic priorities
- Establish working groups, and identify stakeholders for participation



## Resource Management Maturity Questionnaire

**Purpose:**  
The goal of this research study is to form a baseline understanding on the extent of implementation of resource typing, inventorying, and management across the nation at the local, county, state, tribal, territorial, and federal levels. Findings from this effort will help inform future resource management guidance and systems. Appropriate terms are defined below, as outlined in the [National Incident Management System Guideline for Mutual Aid](#).

## VII. Action Plan

Identified Goals & Actions	Lead
Develop a framework and architecture for resource management interoperability and information sharing for mutual aid operations, serving as the national policy and technology interoperability roadmap.	NAPSG, FEMA, DHS S&T in partnership with a NIMS Technology Sub-Group
Form NIMS-related Work Group(s) focused on technology, mutual aid planning, and other relevant themes.	NAPSG, FEMA, DHS S&T in partnership with a NIMS Technology Sub-Group
Conduct an operational needs assessment to determine common policy and technology requirements for resource management interoperability	NAPSG, FEMA, DHS S&T with the NIMS Technology and Resource Management Sub-Groups
Conduct research and develop guidance and best practices on appropriate information and data sharing for resource management and mutual aid that serve as a key resource for SLTT agencies to use in developing their data sharing policies.	NIMS Technology Sub-Group in partnership with any other sub-groups

[https://www.napsgfoundation.org/wp-content/uploads/2019/10/NMATE\\_Action\\_Plan\\_20191018.pdf](https://www.napsgfoundation.org/wp-content/uploads/2019/10/NMATE_Action_Plan_20191018.pdf)

# Supporting Resources

- Defined information requirements for mutual aid
  - [Summary Report](#)
- Developed and released practical Guidance on Resource Management Dashboards
  - [Interactive Version](#) AND [Print Version](#)
- Conducted 2017 and 2019 National Mutual Aid Technology Exercise
  - [2019 NMATE Situational Manual](#)
- Released strategic and tactical NMATE After-Action Report and Improvement Plan
  - [2019 NMATE AAR and Improvement Plan](#)
- Developed and release the Resource Management Planning Tool
  - [Resource Management Planning Tool & Developer Toolkit](#)
- Implementation Guidance on Information Sharing Standards for Crisis Management Systems
  - [Implementation Guidance \(Version 2.0\)](#)
  - Version 3.0 Coming Soon! *Job Aid and Technical Guidance for Incident Management Technology*



# National Resource Hub

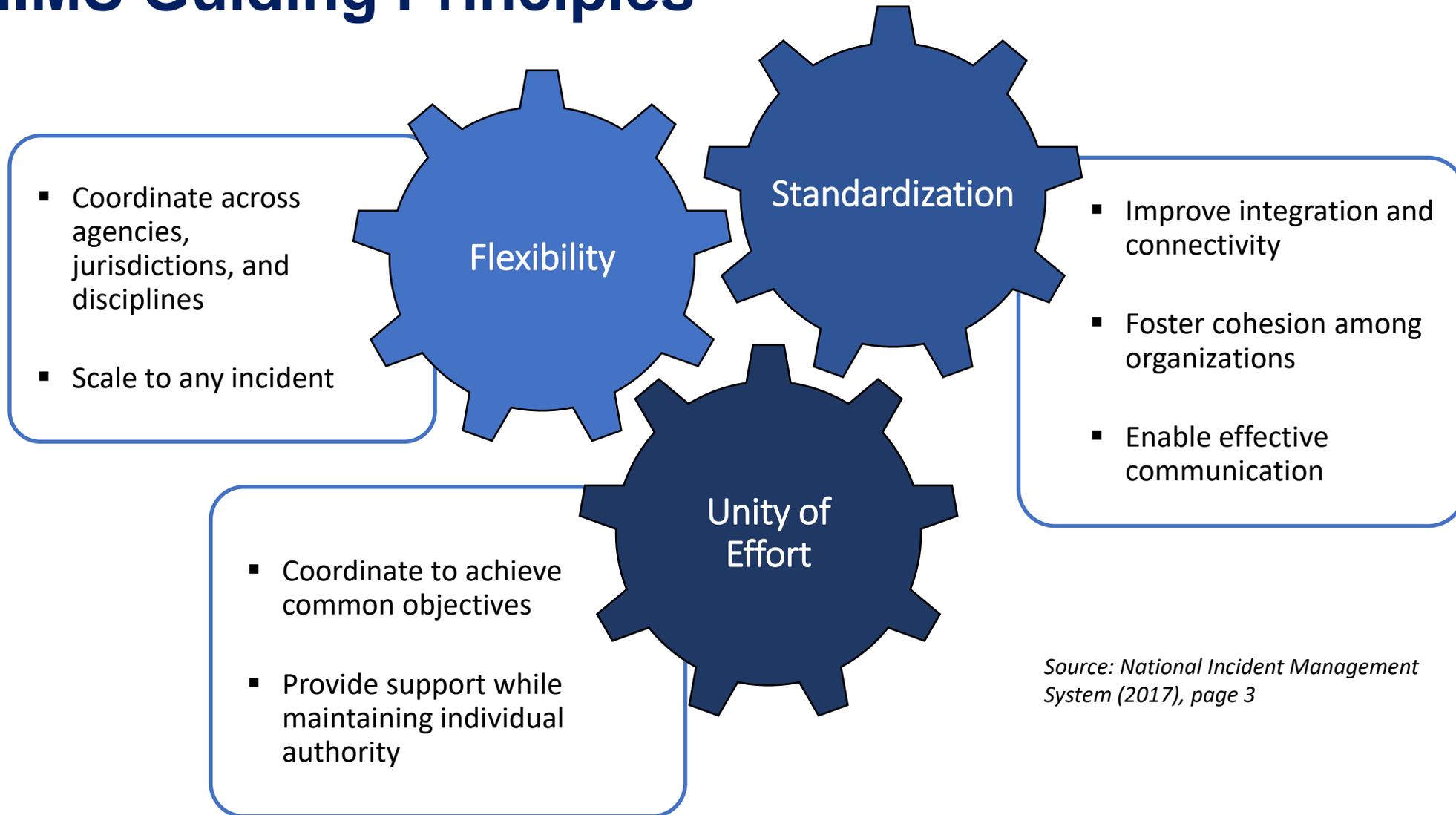
Hank Rowland | FEMA's National Integration Center



NATIONAL INTEGRATION CENTER

*The National Integration Center (NIC) develops doctrine and tools to lead the whole community implementation of the National Preparedness System (NPS) and the National Incident Management System (NIMS).*

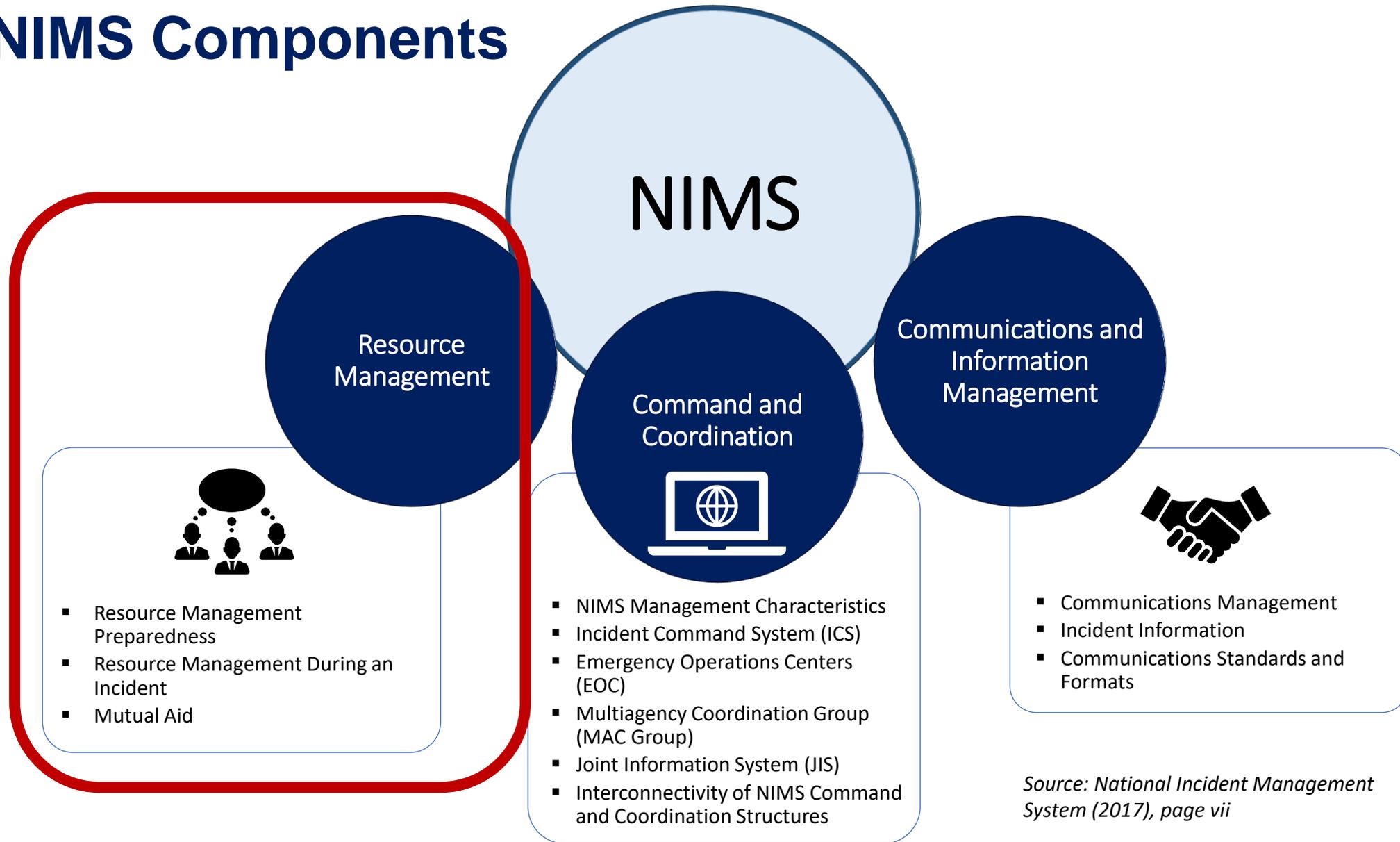
# NIMS Guiding Principles



Source: National Incident Management System (2017), page 3



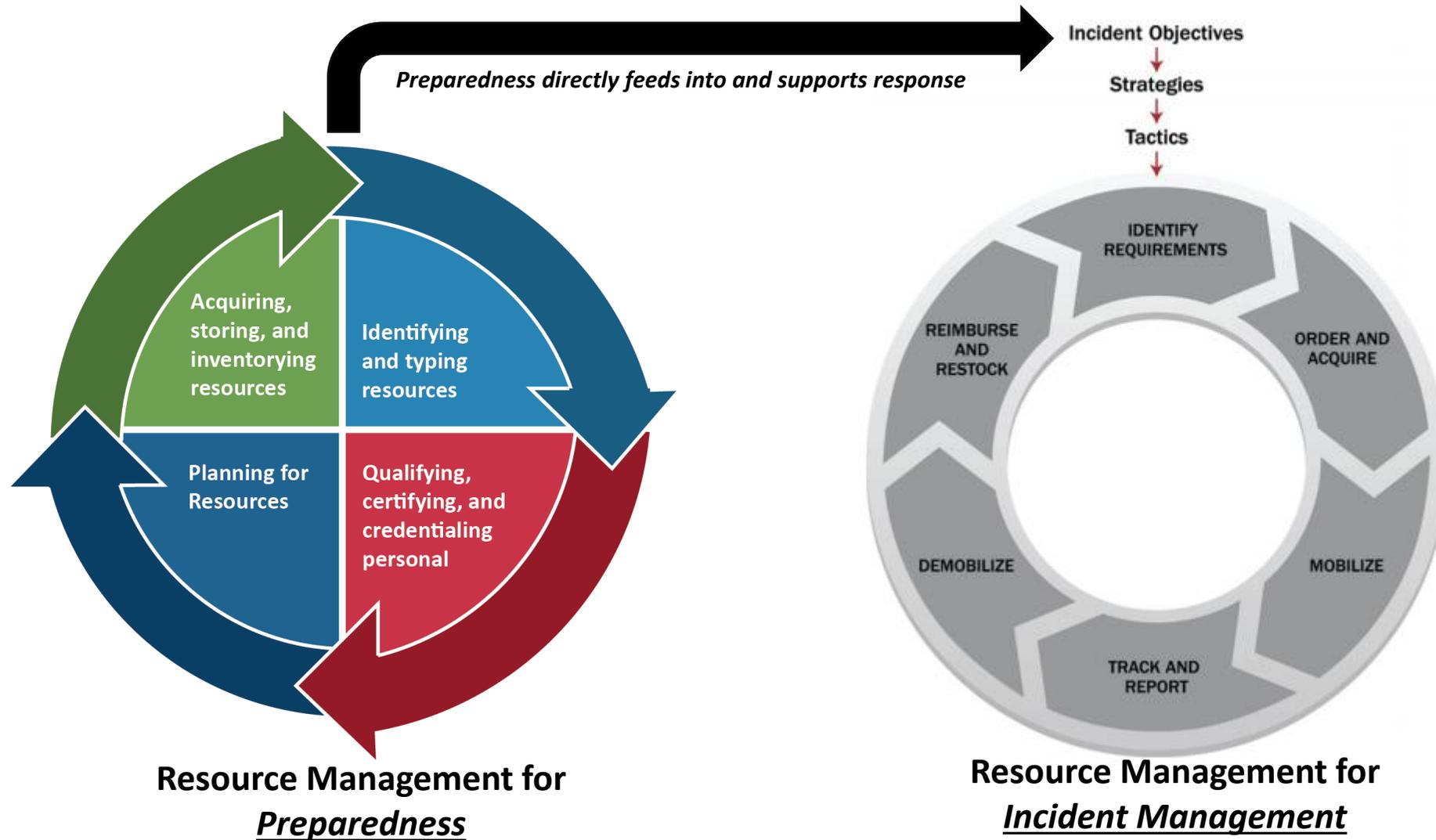
# NIMS Components



Source: National Incident Management System (2017), page vii



# Resource Management – Preparedness vs. Incident



# Why Resource Management - *Preparedness*

- A comprehensive resource management preparedness strategy provides the following benefits:
  - Allows the supplying organization, or provider, to understand expectations of a resource based on the capabilities outlined in resource typing
  - Allows the receiving organization, or requestor, to receive a preassembled and predetermined resource that meets the minimum capabilities for the specified resource type
  - Serves as the foundation for creating and establishing Mission Ready Packages (MRPs)
  - Integrates resource management into day-to-day organizational and jurisdictional operations, making the national mutual aid process a seamless continuation of resource management to support incident operations



# Unifying Resource Management Nationwide



The screenshot shows the FEMA Preparedness Toolkit National Resource Hub interface. At the top, there's a navigation bar with 'FEMA | Preparedness Toolkit' and a 'Sign In' button. Below the navigation bar, there's a header for 'National Resource Hub' with the tagline 'Unifying Resource Management Nationwide'. The main content area is divided into several sections:

- I WANT TO:** Four green buttons: 'Learn About Resource Typing & Qualifications', 'Explore National Resource Types', 'Inventory My Agency's Resources', and 'Manage Personnel Qualifications'.
- ACCESS THE SYSTEMS:** Three blue buttons: 'RTLI + Resource Typing Library Tool', 'IRIS + Resource Inventory System', and 'OneResponder + Personnel Qualifications Management System'.
- About the National Resource Hub:** A paragraph describing the hub as a suite of web-based tools for resource management preparedness. Below this is a circular diagram with four quadrants: 'Accessing, storing, and inventorying resources' (top-left), 'Identifying and typing resources' (top-right), 'Qualifying, certifying, and credentialing personnel' (bottom-right), and 'Planning for resources' (bottom-left).
- What It Does:** A list of bullet points: 'Consolidates and integrates existing FEMA-provided systems for resource management preparedness activities: inventorying, typing resources, managing personnel qualifications, and credentialing.'
- What It Doesn't Do:** A list of bullet points: 'Is not a deployment system. The National Resource Hub does not support resource requests, deployments, or resource tracking. Since it is not a deployment system, it does not support resource requests, deployments, or resource tracking.'

The National Resource Hub is a suite of web-based tools that support a consistent approach for the resource management preparedness process.

- Accessing and automating the use of National Incident Management System (NIMS) resource typing definitions, position qualification sheets, and position task book templates.
- Inventorying individual resources—personnel, equipment, teams, supplies, and facilities.
- Managing personnel qualifications, certification, and credentials.
- Supporting existing resource management-related guidance, policies, practices, and mutual aid compacts.

**National Resource Hub** - <https://preptoolkit.fema.gov/web/national-resource-hub>



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# Basics

## What It Does

- Ensures organizations and resource owners retain full ownership and control over their resources and resource information/data.
- Consolidates and integrates existing FEMA-provided systems for resource management preparedness activities: inventorying, typing resources, managing personnel qualifications, and credentialing.
- Stores information in a secure cloud-hosted, government-authorized environment.
- Offers a no-cost solution for all state, local, tribal, and territorial government agencies and non-governmental organizations.

## What It Doesn't Do

- Organizations and resource owners do not lose control or ownership over their resources or resource information/data.
- Is not a deployment system. The National Resource Hub does not support resource requests, deployments, or resource tracking.
- Since it is not a deployment system, it does not allow any agency or individual to request or deploy resources and personnel through the system.
- Does not change or modify any existing mutual aid agreements or compacts.



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# Resource Management Preparedness Process

- Resource management is the cornerstone of preparing for and responding to incidents that require mutual aid among agencies and jurisdictions.
- Resources refer to: personnel, teams, equipment, supplies, and facilities.

Jurisdictions and organizations acquire, store and inventory resources for day-to-day operations, in addition to stockpiling resources for incidents.

**Solution: Resource Inventory System**

Jurisdictions develop plans for identifying, managing, estimating, allocating, ordering, deploying and demobilizing resources. This involves identifying resource requirements based on threats to, and vulnerabilities of, the jurisdiction or organization.

**Solution: Future Development in National Resource Hub**



By identifying and typing resources, jurisdictions build a common understanding of a specific resource and its capabilities. This process primarily focuses on resources that deploy across jurisdictional boundaries.

**Solution: Resource Typing Library Tool**

Uses a performance-based approach that focuses on verifying the capabilities of personnel to perform as required in incident-related positions. It incorporates education, training, and experience to build proficiency and establishes performance as the primary qualification criterion.

**Solution: OneResponder**



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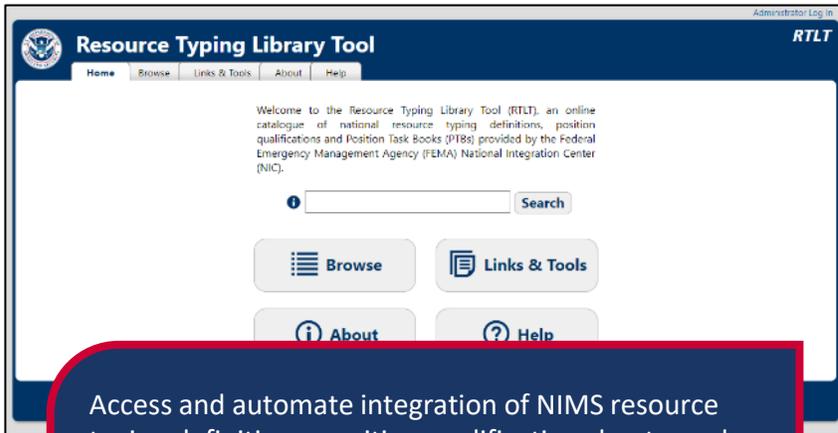
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# Resource Management Technology Tools



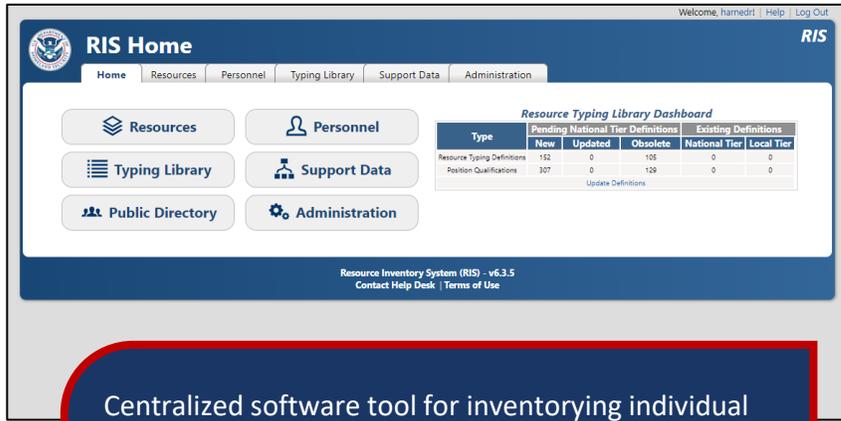
## 1 Resource Typing Library Tool



Access and automate integration of NIMS resource typing definitions, position qualification sheets, and position task book templates

- Centralized database and primary source for 508s, 509s, and PTB templates
- Serves as foundational data model and database for RIS
- Publicly available API for 3<sup>rd</sup> party systems to consume live data feed from RTL

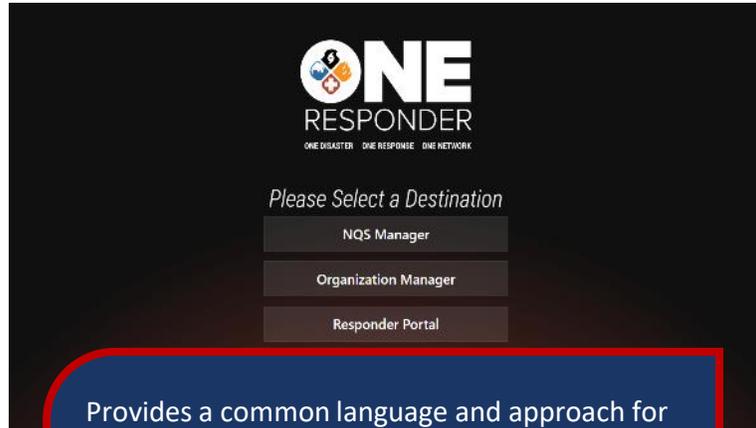
## 2 Resource Inventory System



Centralized software tool for inventorying individual resources, including personnel

- Supports the inventorying of teams, personnel, equipment, facilities, and supplies.
- **June 2021** - Online version of RIS – Resource Inventory System – is available for use by request. A version 2.0 of the Resource Inventory System is in development and will be released in the near future.

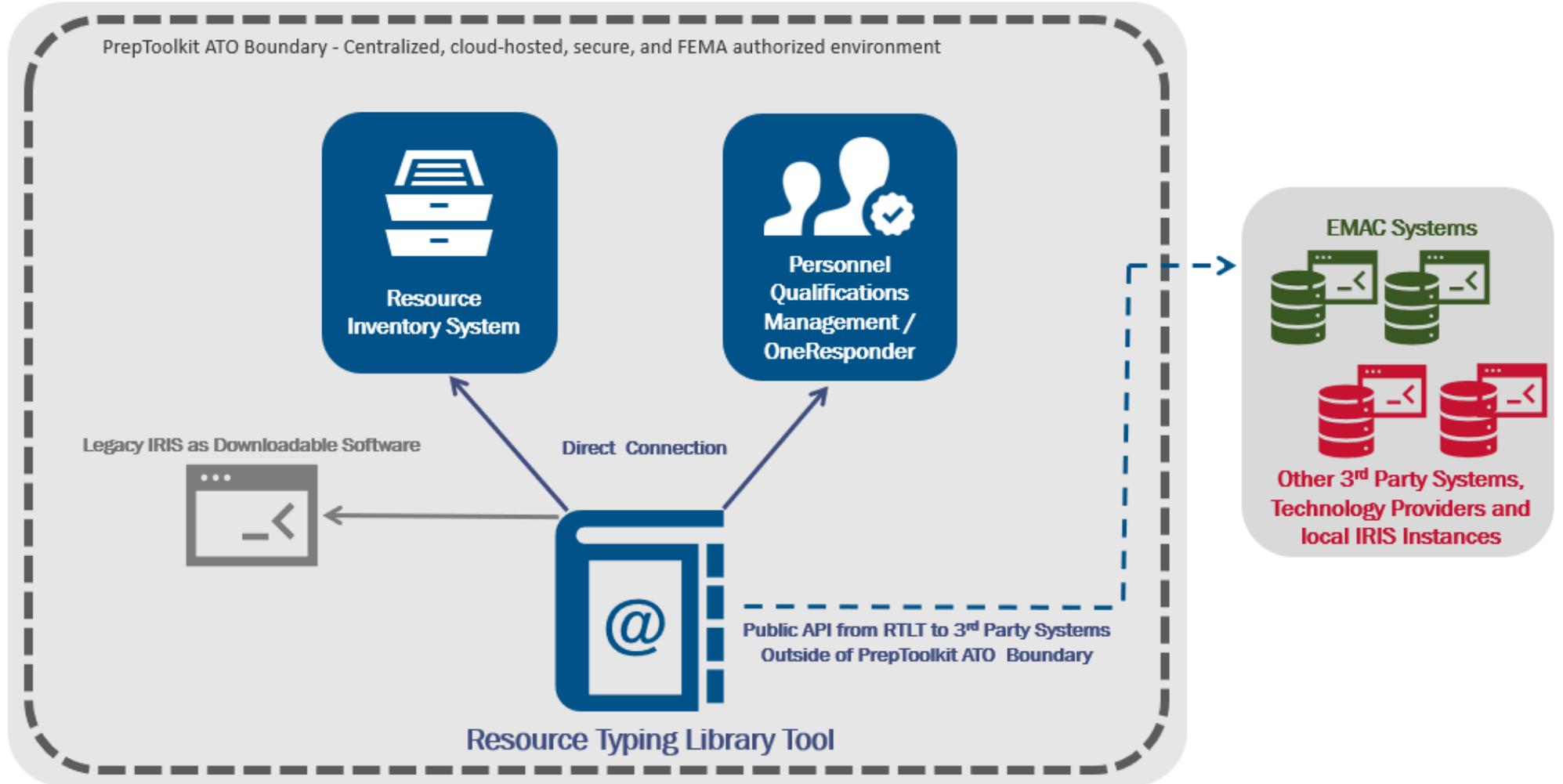
## 3 Personnel Qualifications Management System OneResponder



Provides a common language and approach for managing personnel qualifications and credentials in support of NQS

- Supports the personnel qualifications, certification, and credential management
- **June 2021** - OneResponder now consumes the RTL API, ensuring real-time alignment with 509s and PTB Templates published by FEMA.

# Current Architecture





# Update: Resource Inventory Technology

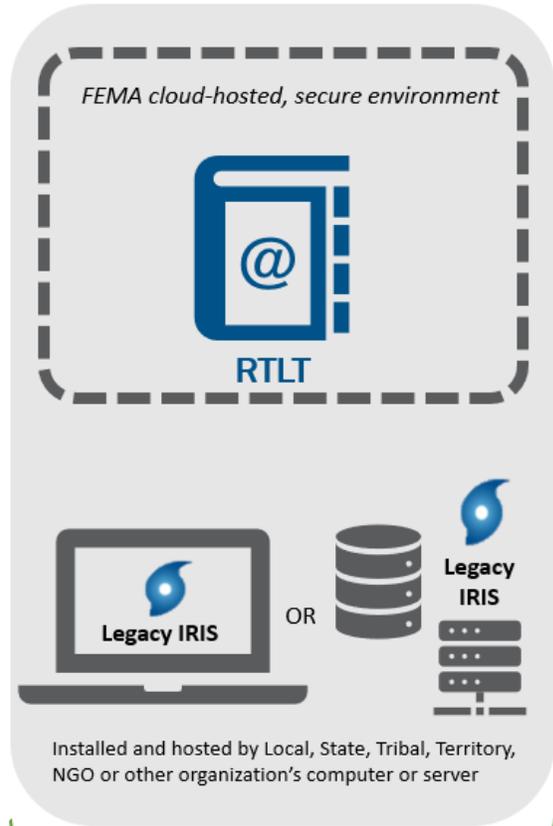
- June 2021 – Released version 1 of the centrally cloud-hosted Resource Inventory System (RIS) as part of the National Resource Hub.
  - Link: <https://preptoolkit.fema.gov/web/national-resource-hub/resourceinventorying>
- RIS v1 pilot implementation phase underway Summer-Fall 2021.
  - Available for use by organizations that do not require a multi-agency hierarchy or established organization relationship model (parent/child)
  - Agencies submit RIS Access Request Form and conduct a Scoping & Orientation Session
  - Each request is reviewed to assess feasibility of the deployment given system limitations
- Access to RIS is legacy IRIS users will not be impacted since the software is locally hosted and managed however, legacy IRIS users are encouraged to transition to RIS.
- Updated and improved version of RIS is in development that will be capable of supporting larger, more scalable implementations.





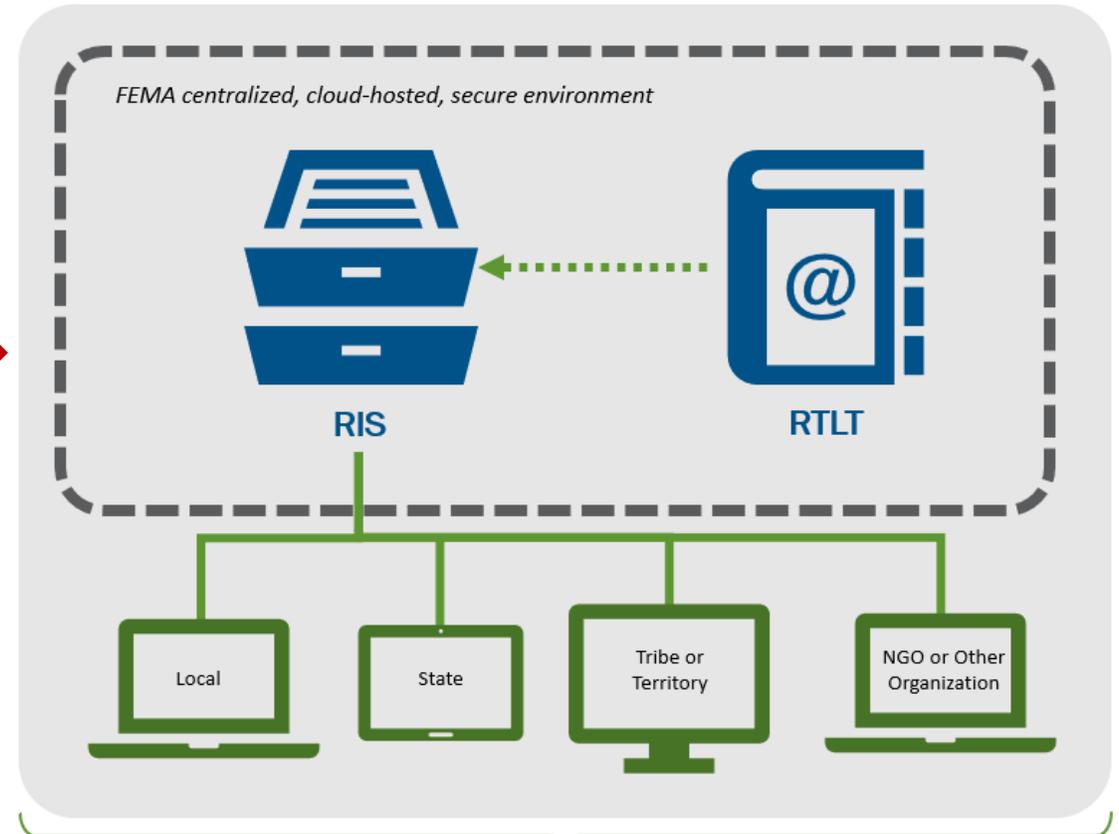
# Next Generation: Resource Inventory Technology

## Legacy IRIS – Transitioning to RIS



Legacy Downloadable Software Model for Resource Inventorizing

## New Resource Inventory System – Version 1.0 Available



NEW Secure, Centralized, and Cloud-Hosted Resource Inventory Solution



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# RIS Technology Capabilities

## RIS Capabilities & Functionality

- A centralized, secure, and cloud-hosted solution that is hosted within a FEMA authorized environment.
- Automatically uses the NIMS resource typing definitions cataloged in the RTLT.
- Create local definitions when NIMS definitions or position qualification sheets do not align or apply.
- Local definitions populate to a common library for viewing by all organizations using RIS.
- Includes a basic “Resource Typing Calculator” to aid in confirming which NIMS resource typing definition resource aligns to when inventorying.
- Able to configure an agency’s inventory and manage its users and their roles/permissions.
- Limited resource viewing across organizations is defined in the [Terms of Use](#).

## RIS Limitations

- Does not currently support relationships between organizations.
  - Does not have any hierarchal organization model or parent/child relationships between multiple organizations/agencies/jurisdictions.
- User management and organization assignment process is time-consuming for larger/multi-agency implementations.
- Only static data exports available in the following formats: CSV, KML, XML.
- Does not yet have a pre-configured API or live web service as a data “export” option.
- When migrating legacy IRIS data into RIS, most but not all, data fields will migrate when running bulk imports.



**FEMA**

# Gain Access to the Systems

- **Resource Typing Library Tool**
  - Publicly Available System
  - <https://preptoolkit.fema.gov/web/national-resource-hub/resource-typing>
  
- **Resource Inventory System (RIS)**
  - Submit RIS Access Request Form
  - FEMA creates the AHJ's organization in RIS, and the "Organization Administrator" from that AHJ manages their users and resource inventory
  - <https://preptoolkit.fema.gov/web/national-resource-hub/resourceinventorying>
  
- **OneResponder**
  - Organization managers can take ownership of their jurisdiction's account by reaching out to their state's OneResponder administrator or by contacting FEMA-NIMS@fema.dhs.gov.
  - New responder accounts are issued by invitation only. Individuals interested in using the system should contact their qualifications manager to find out if their jurisdiction uses the system.
  - <https://preptoolkit.fema.gov/web/national-resource-hub/personnel-qualifications>

Note - RIS and OneResponder use a single sign-on with PrepToolkit. Users only need one set of credentials to log-in to the systems. An approved PrepToolkit account must be established before a user can sign into RIS or OneResponder.



# **ACHIEVING INTEROPERABILITY FOR INCIDENT MANAGEMENT TECHNOLOGY**

REBECCA HARNED | 4 ARROWS CONSULTING, INC.

# PROBLEM

- **During an incident, speed is life.** The speed by which the right and accurate information is available to Leaders and Managers directly influences the outcome for survivors.
- The public safety community continues to experience challenges applying incident management technology, not because of a lack of technology, but due to the **insufficient use of interoperability and information exchange standards** for system-to-system data exchange.

# SOLUTION

- Help leaders and managers inform the acquisition and selection of technology that applies the appropriate incident management information sharing standards – thereby improving interoperability among the public safety community nationwide.

## Approach

- Provide public safety leaders with a simple guide to map their decision-making needs to the appropriate information and sharing standard(s).
- Provide guidance for technologists/vendors to use in implementing the standards within relevant systems/technology.

# WHY ARE STANDARDS IMPORTANT?

- Leaders and managers cannot assume that interoperability is inherent in the products being promoted by technology providers and vendors.
- Ensuring interoperability increases the longevity of the technology investment and overall sustainability.
- Since standards do not change frequently, upgraded software/technology does not need to be purchased as often.
- While user interface and functionality requirements are important, the underlying data, how it is managed and shared, provide the true longevity of any system.
- Standards provide an agreed upon data format that knowledgeable groups have vetted through a series of community-involved reviews and can allow systems to speak easily to one another.
- Reduces the need for customization and development that will often come as an offer with the software or system - which in turn reduces cost.

# GUIDANCE

- GOAL - Equip leaders and managers with requisite knowledge to inform the acquisition and selection of incident management technology that apply information sharing requirements and standards - thereby improving overall interoperability among the public safety community nationwide.
- Current Version 2.0 - Single document that covers:
  - Basics of the data standards and how they map to situational awareness and resource management
  - Which data and elements need to be considered
  - How to send data and elements across systems
  - Where/how to have systems communicate
  - Communication Protocol: MQTT or HTTP
- Future Version 3.0 - *Coming September 2021*
  - Job Aid: Incident Management Technology Acquisition & Interoperability
  - Technical Guide: Information Sharing Standards Implementation in Incident Management Technology

# MISSION-CRITICAL QUESTIONS & CONSIDERATIONS

## Situational Awareness

Workflow Considerations	Explanation
<b>Detailed Event Information</b>	Is detailed information needed about a specific event, including current status and location, future predictions and impact area, and how to respond to a specific event?
<b>General Event Information</b>	Is more summary level, current information needed about an event?
<b>Health Facility Status</b>	Is detailed information needed about a specific health care facility, including bed status, ER capacity, EMS response availability, etc.?
<b>General Infrastructure Status</b>	Is a general status needed for a specific infrastructure facility, such as Power Plant X, or for a general infrastructure category, such as communication?
<b>Detailed Other Infrastructure Status</b>	Is detailed information, similar to the type of information in health facility status, needed for a specific, non-health infrastructure facility?
<b>Social Vulnerability and Demographic Trends</b>	Is information needed about socially vulnerable, demographic trends, or demographic information within an area of interest?

## Resource Management

General Category	Resource Information Requirements for SA	Workflow Considerations	Explanation
<b>Mutual Aid</b>	Resource Kind, Resource Response Availability, Resource Readiness, Deployment Time, Resource Cost	<b>Mutual Aid Request</b>	Is a request and response for aid needed, including costing?
<b>Tasking</b>	Status of taskings during the response	<b>Tasking</b>	Is the ability to task a responding resource needed?
<b>Current Status</b>	Resource Kind, Resource Response Availability, Resource Readiness	<b>Location + Status</b>	Is the current status and location of a specific resource needed?
<b>General Status</b>	Resource Kind, Resource Response Availability, Resource Readiness	<b>General Resource Information</b>	Is a general status about a specific responding resource and/or all responding resources?

# IDENTIFIED STANDARDS

- List of identified standards to be applied to incident management and mutual aid technology
- Most are from the Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) suite of standards

Standard	Authoritative Information
Common Alerting Protocol (CAP) - OASIS	<a href="http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.html">http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.html</a>
Hospital Availability Exchange (HAVE v2) - OASIS and HL7 <sup>R</sup>	<a href="https://docs.oasis-open.org/emergency/edxl-have/v2.0/edxl-have-v2.0.html">https://docs.oasis-open.org/emergency/edxl-have/v2.0/edxl-have-v2.0.html</a>
Distribution Element (DE) - OASIS	<a href="http://docs.oasis-open.org/emergency/edxl-de/v2.0/edxl-de-v2.0.html">http://docs.oasis-open.org/emergency/edxl-de/v2.0/edxl-de-v2.0.html</a>
Resource Messaging (RM) - OASIS	<a href="http://docs.oasis-open.org/emergency/edxl-rm/v1.0/EDXL-RM-SPEC-V1.0.html">http://docs.oasis-open.org/emergency/edxl-rm/v1.0/EDXL-RM-SPEC-V1.0.html</a>
Situation Report (SitRep) - OASIS	<a href="http://docs.oasis-open.org/emergency/edxl-sitrep/v1.0/edxl-sitrep-v1.0.html">http://docs.oasis-open.org/emergency/edxl-sitrep/v1.0/edxl-sitrep-v1.0.html</a>
Tracking Emergency Patients (TEP) - OASIS	<a href="http://docs.oasis-open.org/emergency/edxl-tep/v1.1/edxl-tep-v1.1.html">http://docs.oasis-open.org/emergency/edxl-tep/v1.1/edxl-tep-v1.1.html</a>
Emergency Management Loose Coupler-National Information Exchange Model (NIEM)	NIEM EM - <a href="https://www.niem.gov/communities/emergency-management">https://www.niem.gov/communities/emergency-management</a> NIEM Releases - <a href="https://niem.github.io/niem-releases/">https://niem.github.io/niem-releases/</a>

# HOW STANDARDS APPLY TO INCIDENT MANAGEMENT TECHNOLOGY & OPERATIONS

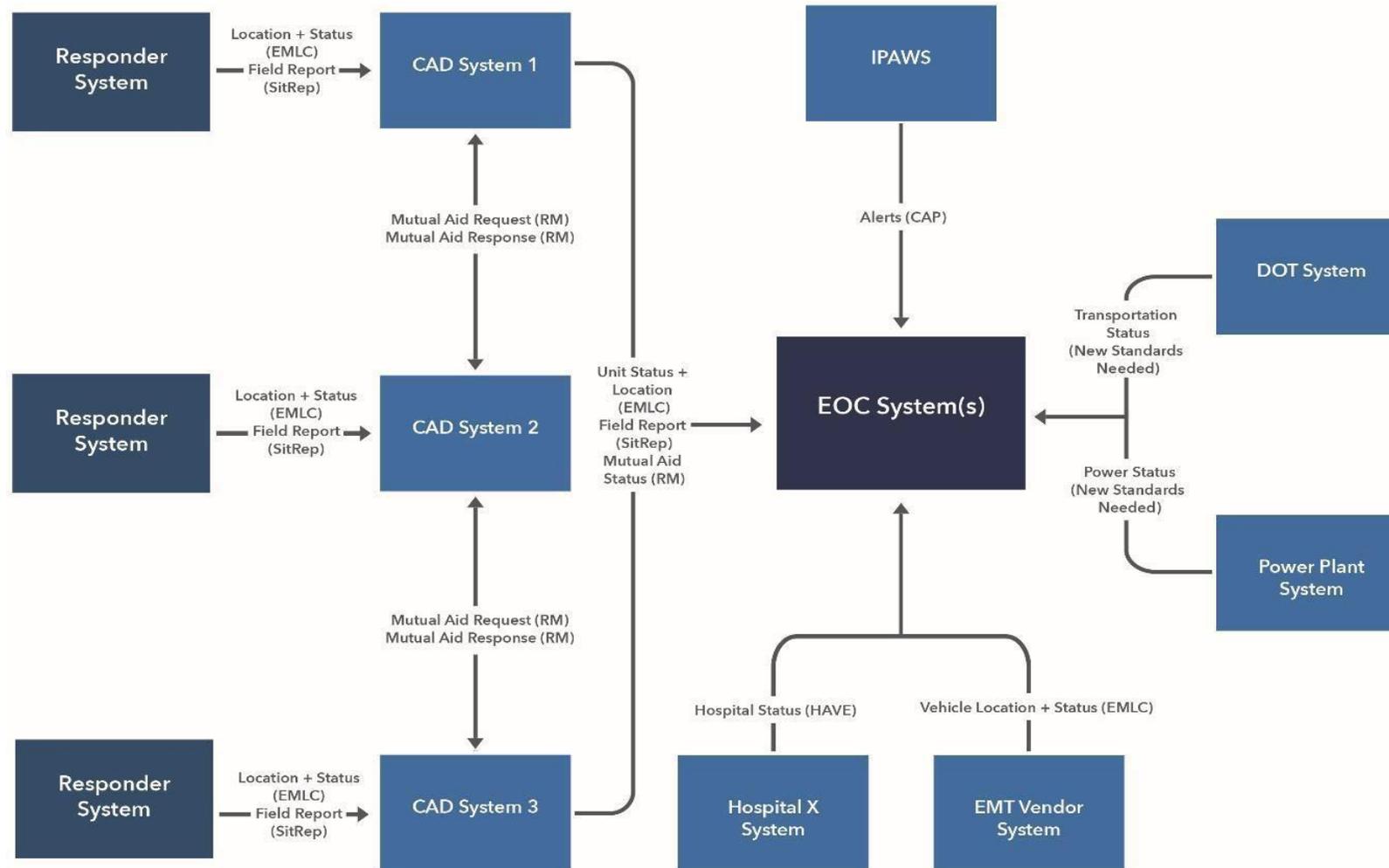
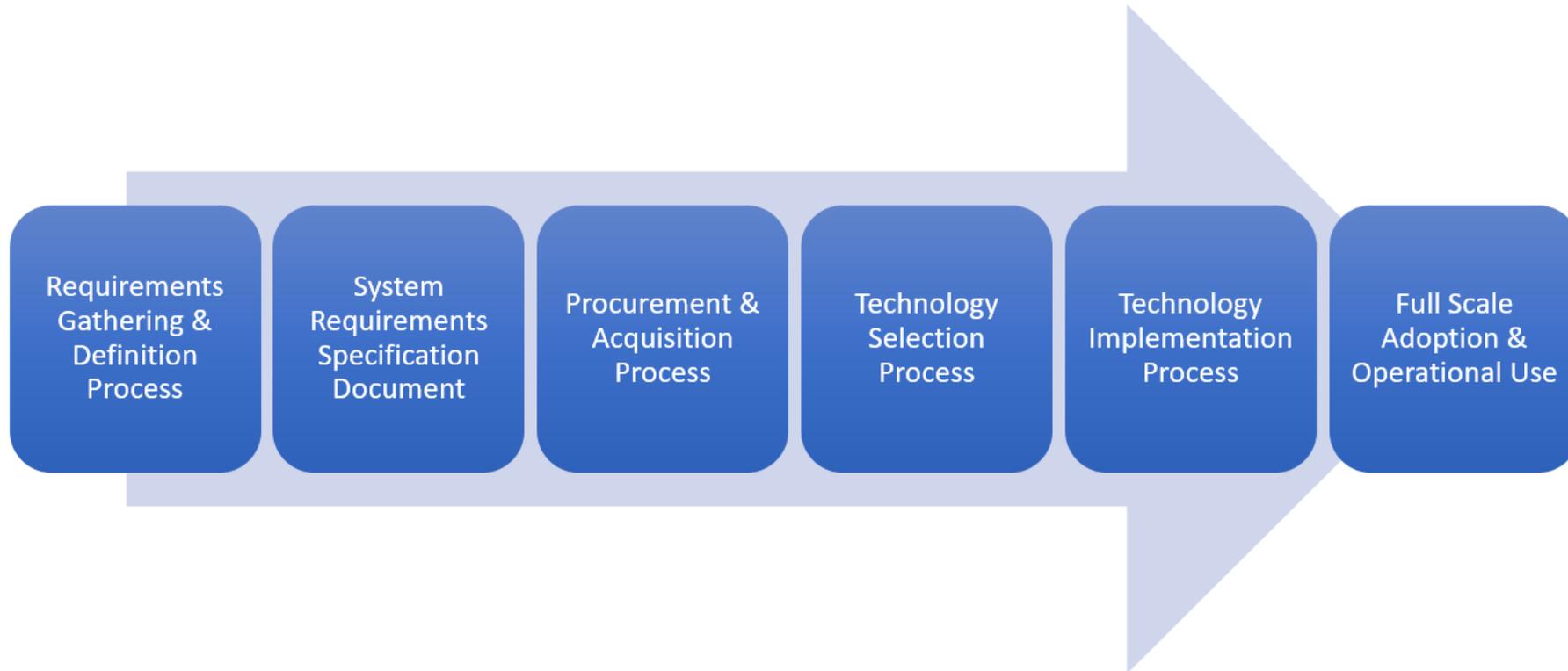
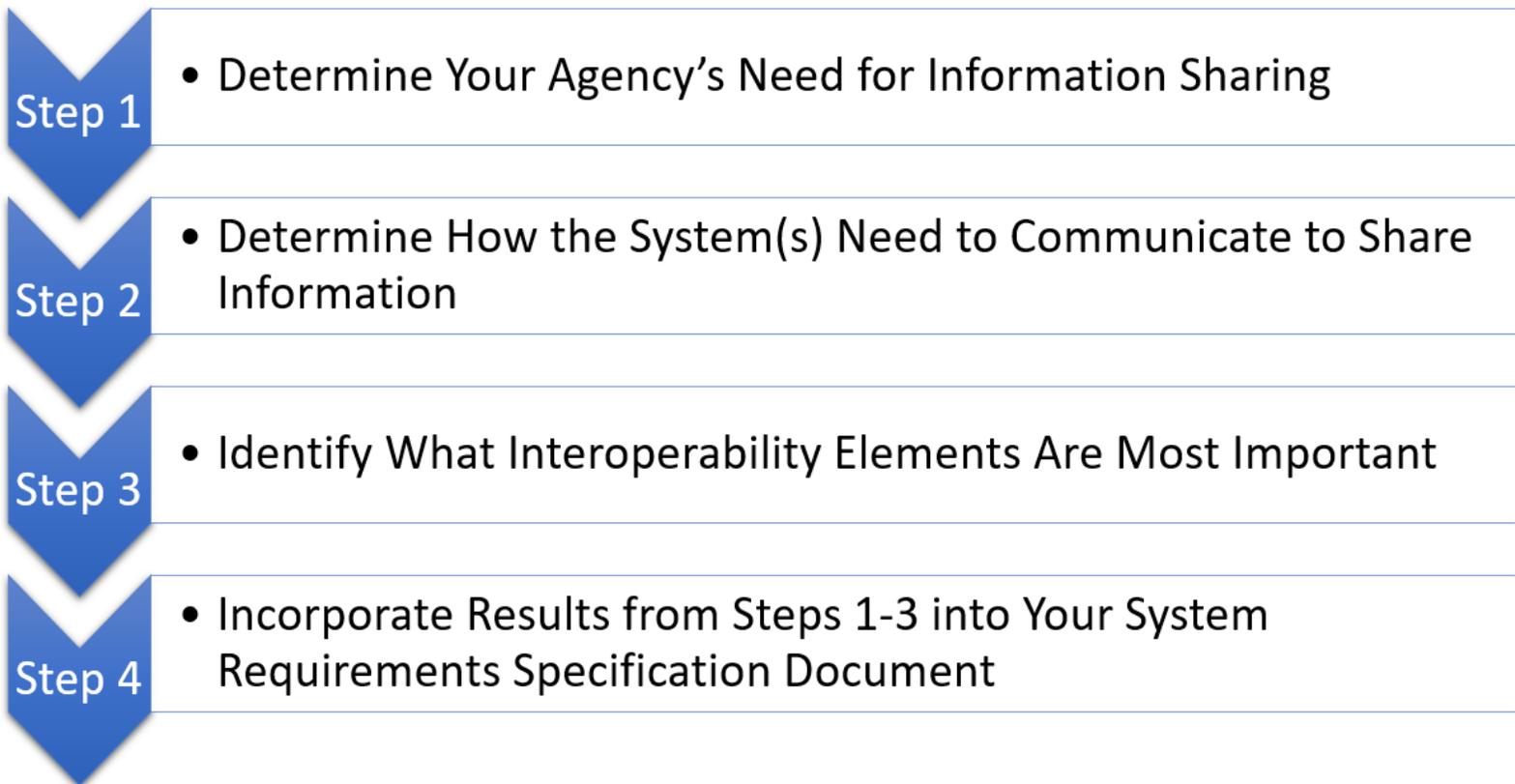


Figure 7- Scenario Standards Overview

# TECHNOLOGY DECISION-MAKING



# STEPS TO ASSESS INFORMATION SHARING REQUIREMENTS



# ASK YOURSELF AND YOUR TEAM THE RIGHT QUESTIONS

## *Self-Assess Your Information Needs*

- What information do you need for better decision-making?
  - Situational Awareness Information
  - Resource Management Information
- Who has that information?
- Among whom does that information need to be shared?
  - How will your agency and your mutual aid partners need to consume and use that information?
- How do you need to analyze that information for decision-making?
  - What are the thresholds and metrics that you use to inform operational decisions?

# SELF-ASSESS YOUR INCIDENT MANAGEMENT TECHNOLOGY SYSTEM

*If you already have a system, work with your team to answer these questions*

- Does your system contain the information you need to inform decision for operational planning and response?
- What information gaps do you need to address in your system?
- Where can get the data to fill those gaps?
- Is that data available in interoperable formats?
- What information and data do you have in your system that would benefit your mutual aid partners if shared?
- What standard formats do you need to share/exchange that data?

# ASK YOUR TECHNOLOGY PARTNERS/VENDORS THE RIGHT QUESTIONS

*If you are updating an existing system or procuring a new system, be sure to talk with your technology partners and vendors.*

Ask hard questions about how their technology supports (or doesn't) interoperable information sharing standards

## Situational Awareness Information

- Can you connect to live feeds?
- What data formats are acceptable?
- How easy is it to consume open data from other sources? Are you able to visualize and analyze that information?

## Resource Management Information

- How does your technology you store and technically manage resources? Is it a relational database model or a flat file structure?
- How do you load data into your system?
- How do you ensure resources are aligned to the FEMA Resource Typing?
  - Do you connect to RTLTL through the RTLTL API? If so, how frequently does your system run updates?
- Is your database constructed using [open standards](#)?

# ASK ABOUT INFORMATION SHARING

- How does your technology support bi-directional information sharing?
- Does your technology make a live service or API available?
  - What is required to access and use the API (i.e. level of user access)?
  - Does it apply open interoperable standards?
- Do you publish web services?
  - If so, in what formats and for what information/data?
  - Does it apply open interoperable standards?
- Are there other export capabilities? If so, what formats?

# APPLY THE GUIDANCE

Don't assume your technology partners and vendors are up-to-speed on the latest interoperable standards for information sharing.

- Equip them with information and guidance to inform systems engineering.
- Don't speak tech talk?
  - **Communicate the operational benefit** and importance of developing your system to support interoperability
  - **Give them this [guidance](#)**
  - Include detailed information about your information sharing needs and the applicable standards in your System Requirements Specification Document.
    - This should be part of your procurement/acquisition documentation and can be included in your agency's RFP.
- Developing an RFP for System Upgrades or a New System?
  - Include **specific requirements** for development using interoperable standards and data/API formats
  - Require technology partners/vendors to **build to open standards**
  - Require technology partners/vendors to **support your team's information needs**

# START USING THE GUIDANCE

- Version 2.0 Available Today
  - Link: [https://www.napsgfoundation.org/wp-content/uploads/2020/09/InfoSharing\\_Guidance\\_v2\\_20200914.pdf](https://www.napsgfoundation.org/wp-content/uploads/2020/09/InfoSharing_Guidance_v2_20200914.pdf)
- Version 3.0 - *Coming September 2021*
  - *Stay Tuned!*

## Implementation Guidance: Information Sharing Standards for Crisis Management and Mutual Aid Technology

Version 2.0  
September 2020



National Alliance for Public Safety GIS (NAPSG) Foundation  
5335 Wisconsin Ave., NW | Suite 440 | Washington, DC 20015

# Basics on the Emergency Data Exchange Language – Why it Matters

Elysa Jones | OASIS Emergency Management Technical Committee



National Alliance for Public Safety GIS (NAPSG)

PrepTech Talk: Innovations in Resource Management & Mutual Aid Technology

Know the Basics on EDXL and Why it Matters

7/22/2021

Elysa Jones, Chair

OASIS Emergency Management Technical Committee (EMTC)

[elysajones@yahoo.com](mailto:elysajones@yahoo.com)

# Agenda

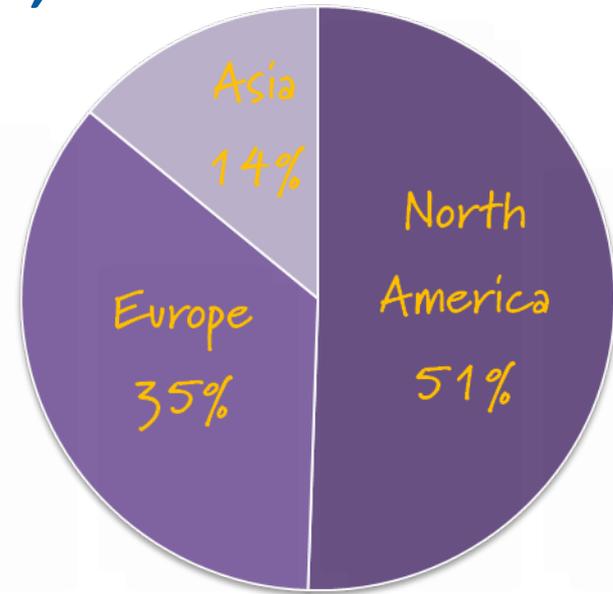
- **OASIS - Organization for the Advancement of International Standards**
- **Data Interoperability**
- **CAP Around the World**
- **EDXL – Emergency Data Exchange Language**
- **Why EDXL**
- **References**

# Established presence, Current agenda

- Nonprofit consortium
- Founded 1993
- Global

2,000+ participants

70+ communities, 6 continents



- Home of 70+ Technical Committees
- Broad portfolio of standards: security, privacy, Cloud, M2M, IoT, content technologies, energy, eGov, legal, **emergency management**, finance, Big Data, healthcare, + other areas identified by members

# Internationally recognized

- EU classifies OASIS as “one of the top three ICT consortia”.
- EU Regulation 1025/2012 allows OASIS specs to be referenced in public procurement
- OASIS is permanent member of EC’s European Multi-Stakeholder Platform on ICT Standardization
- OASIS TC Process is ANSI-accredited.



European Union

- Lightweight process to ensure integrity of work while allowing for rapid progress
- All TC work is publicly accessible and provided without fee
- Membership is open to any organization or individual
- Democratic; all TC members have same rights and obligations
- ‘All You Can Eat’ membership
- Proposers choose IPR mode when TC is formed:
  - RAND
  - RF on RAND
  - RF on Limited Terms
  - Non-Assertion

<https://www.oasis-open.org/policies-guidelines/ipr>

# Technical Committee Process

OASIS Technical Committees enable members to develop specifications and related deliverables in an open process with a path to recognition in international policy and procurement.

# OASIS → de jure

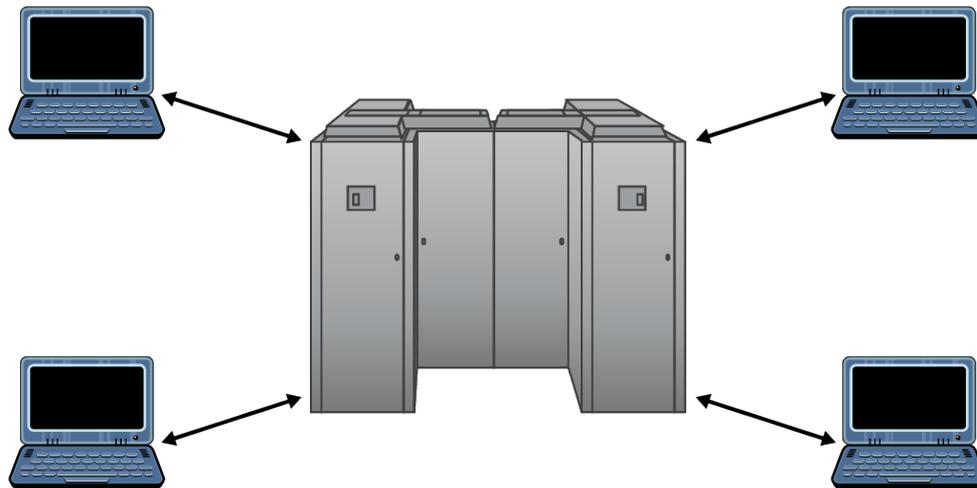
OASIS Standard	Also Approved As:
Advanced Message Queuing Protocol (AMQP)	ISO/IEC 19464
ebXML Collaborative Partner Profile Agreement	ISO 15000-1
ebXML Messaging Service Specification	ISO 15000-2
ebXML Registry Information Model	ISO 15000-3
ebXML Registry Services Specification	ISO 15000-4
Security Assertion Markup Language (SAML)	ITU-T Rec. X.1141
Extensible Access Control Markup Language (XACML)	ITU-T Rec. X.1142
OpenDocument Format (ODF)	ISO/IEC 26300
Common Alerting Protocol (CAP)	ITU-T Rec. X.1303
Computer Graphics Metafile (WebCGM)	W3C WebCGM
EDXL Tracking of Emergency Patients (TEP) 1.1	HL7 Implementation Guide – Bi-Directional Transformation Specification
EDXL Hospital Availability Exchange (HAVE)	HL7 Cross Paradigm Implementation Guide

# The Data Sharing Challenge

- Ineffective communications makes
  - *Preparedness* collaboration difficult
  - *Response* decision-making slow; and
  - Risks lives
- Emergency Management, Public Health, Hospitals, and First Responders cannot “talk” (share data) across agencies, professions, or jurisdictions
  - Most have their own disparate Systems & technologies due to separate procurement, budget, and asset lifecycles.
- Voice interoperability efforts are improving, but data-sharing needs are not only growing, but a must.
- EDXL is a family of standards, providing a common language, or interface, for data exchange across disparate emergency-related systems

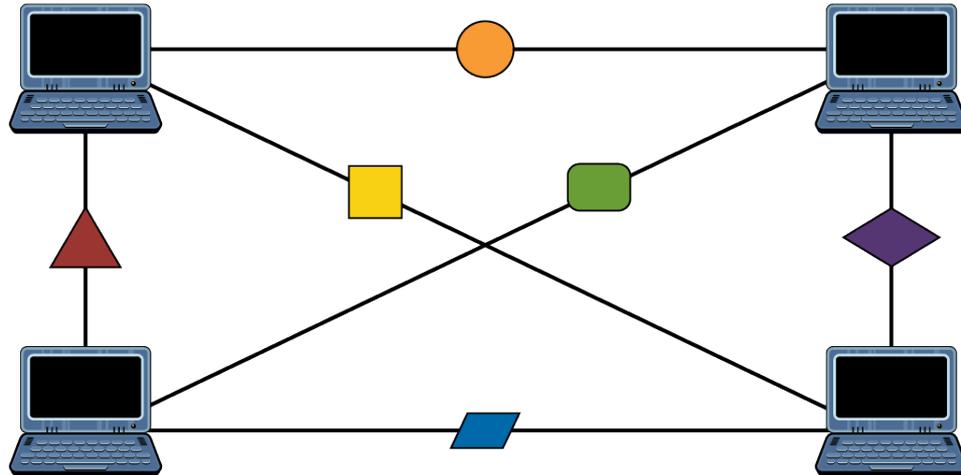
# Interoperability Approach: Single System

No single system can meet all needs



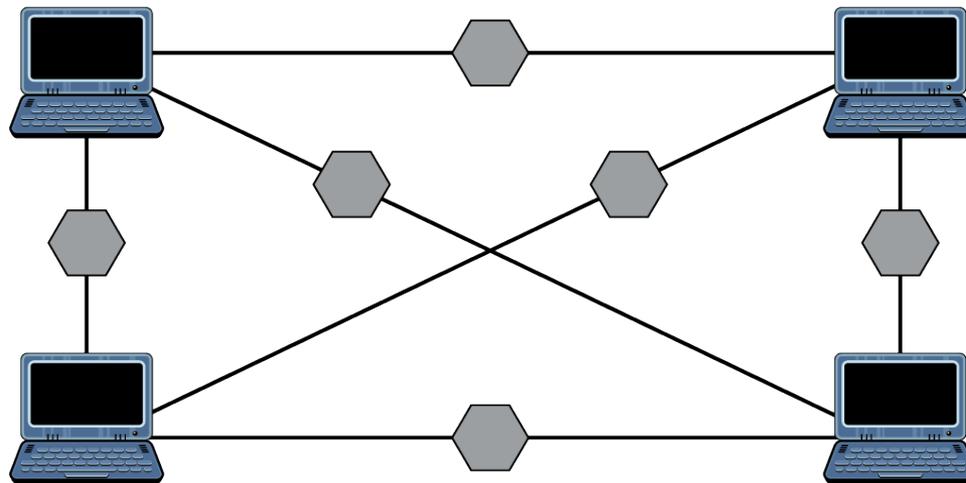
# Interoperability Approach: Custom Interfaces

Cost prohibitive to build custom interfaces between every system

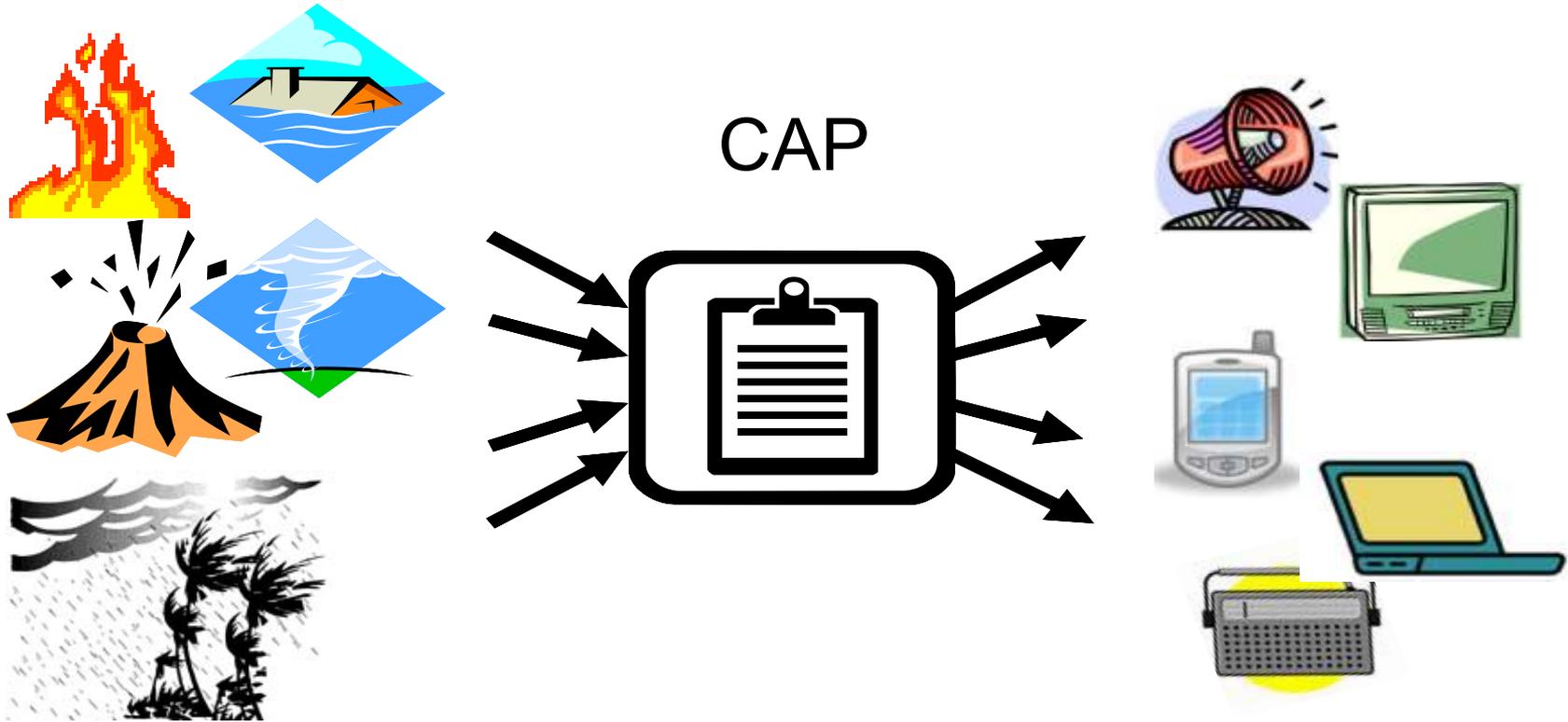


# Interoperability Approach: System of Systems

Standards provide a common interface for different systems to share information

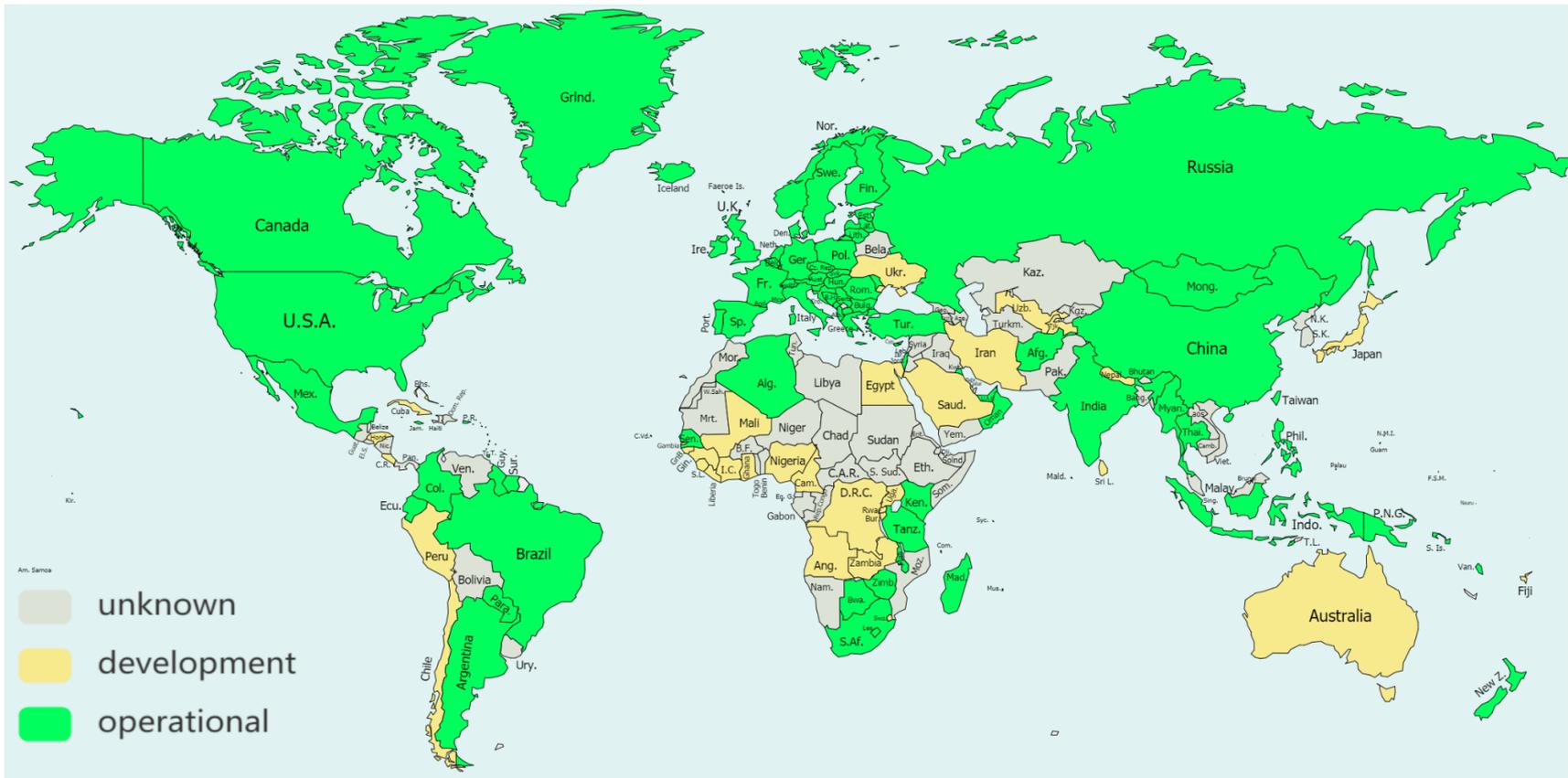


# All-Hazards, All-Media



# Where is CAP in use today?

About 70% of the world's people live in a country with one or more national-level CAP feeds [\[map\]](#) [\[report\]](#)



# Implementations

## ■ National

- Americas: Anguilla (UK), Antigua and Barbuda, Argentina, Aruba (Netherlands), Bahamas, Barbados, Brazil, Canada, Chile, Colombia, Cuba, Curacao (Netherlands), Dominica, Grenada, Guyana, Jamaica, Mexico, Montserrat (UK), Puerto Rico (US), Saint Kitts and Nevis, Saint Lucia, Sint Maarten (Netherlands), Trinidad and Tobago, United States, US Virgin Islands. South America: Argentina, Brazil, Chile, Colombia, and Guyana.
- Europe, Middle East, Africa: Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Burundi, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kenya, Kuwait, Latvia, Lithuania, Luxembourg, Macedonia, Malawi, Malta, Mauritius, Moldova, Montenegro, Netherlands, Nigeria, Norway, Poland, Portugal, Romania, Rwanda, Serbia, Slovakia, South Africa, Spain, Sweden, Switzerland, Tanzania, Togo, United Kingdom, Zimbabwe

# Implementations

## ■ National - continued

- Asia/Pacific: Australia, China, Fiji, Hong Kong, India, Indonesia, Kazakhstan, Kyrgyzstan, Maldives, Madagascar, Myanmar, Nepal, New Zealand, Papua New Guinea, Philippines, Russia, Samoa, Solomon Islands, Sri Lanka, Taiwan, Tajikistan, Thailand, Tonga, Uzbekistan, Vanuatu

## ■ NGO and Commercial

- International Federation of Red Cross and Red Crescent Societies (IFRC)
- Google Public Alerts
- Federated Internet Alerts

## ■ Commercial Weather Alerting

- AccuWeather
- MeteoFrance Vigilance
- MeteoFrance International, MeteoFactory
- The Weather Company

# Implementations

## ■ Sensors that Emit CAP

- In-home monitors becoming all-hazard alarms
  - Halo+ smoke alarm
  - Speck sensor
- Earth Networks (lightning detection)
- Earthquake Building Damage Assessment

## ■ Other CAP-based Systems

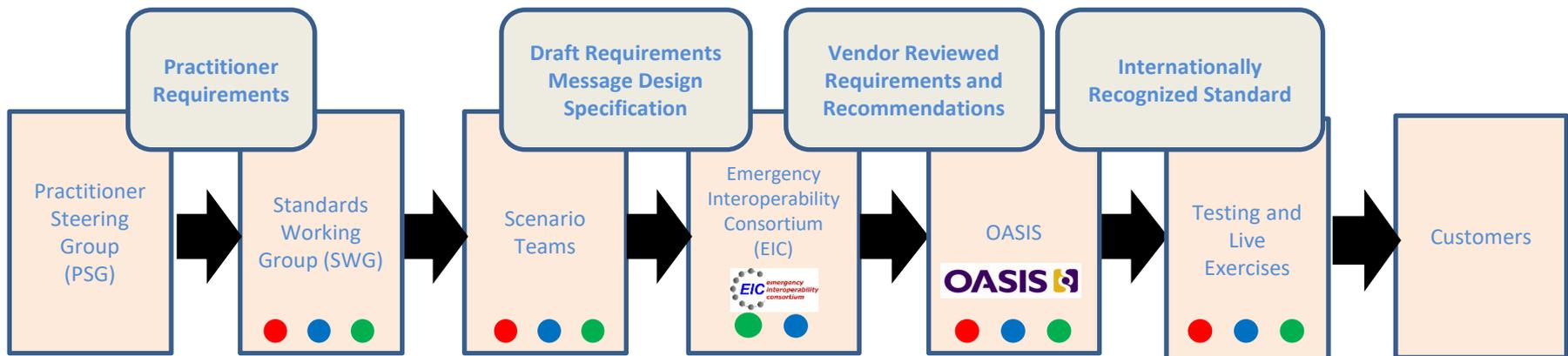
- IBM Intelligent Operations Center for Emergency Management video Users Guide
- Microsoft CityNext
- Hate Group Monitoring
- Neighborhood Watch
- RSOE Emergency and Disaster Information Service

# CAP Information Resources

- [CAP Implementations by Country](#)
- [CAP References \(PrepareCenter.Org\)](#)
- [CAP Video \(10 minutes, made by IFRC\)](#)
- [Guidelines for Implementation of CAP-Enabled Emergency Alerting \(PWS-27\)](#) *free to download*  
*in [English](#) [Arabic](#) [French](#) [Russian](#) [Spanish](#)*
- CAP Training Courses – contact Eliot Christian  
[eliot.j.christian@gmail.com](mailto:eliot.j.christian@gmail.com)

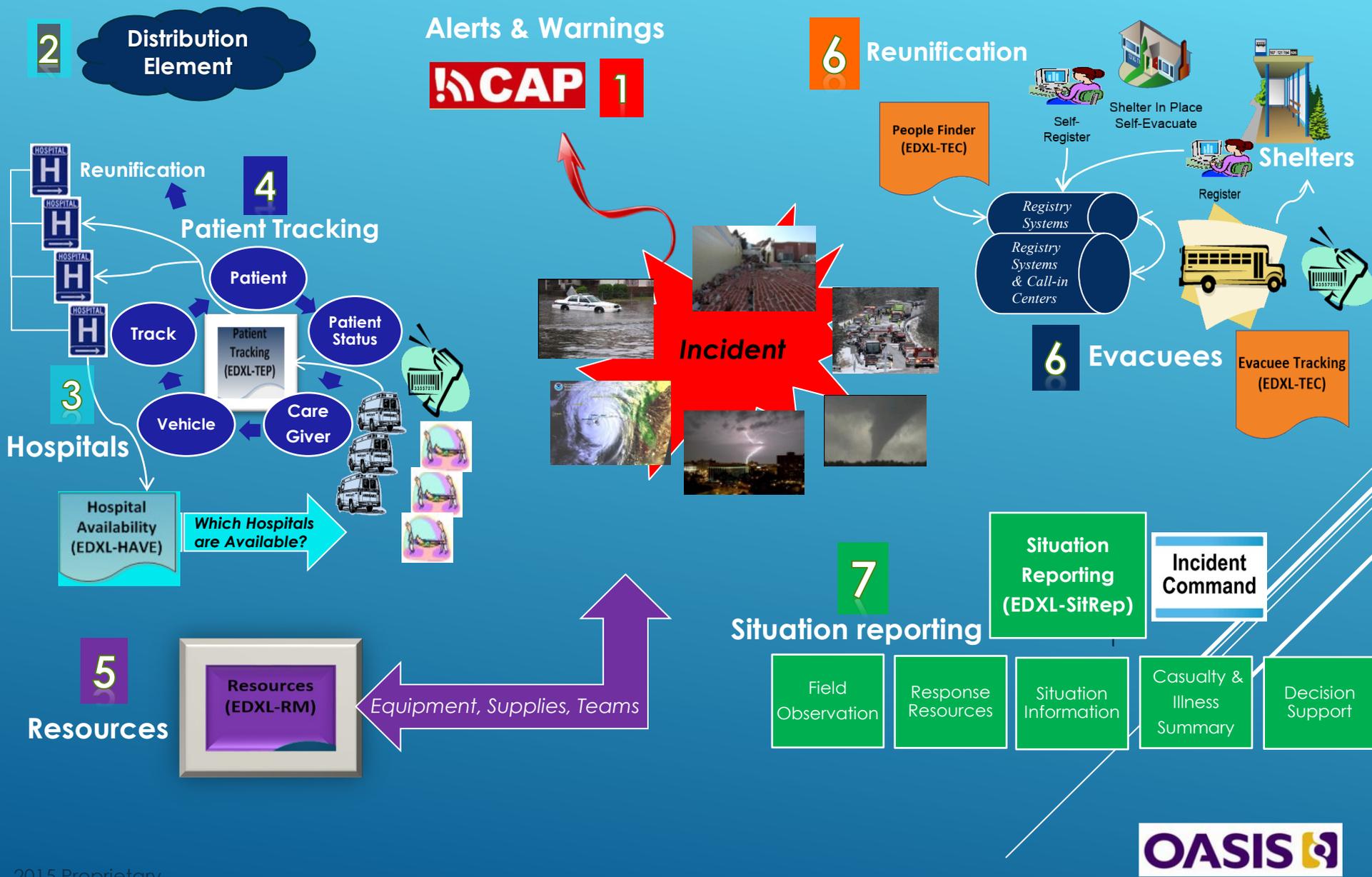
# EDXL was developed by Emergency and Health Practitioners

- In 2003 the first Practitioner Steering Group (PSG) was formed to address this need
- Emergency Data Exchange Language (EDXL) Process



- Emergency and Healthcare Practitioners
- Local, State & Federal Government
- Industry - Product Providers

# EDXL family of Emergency Management Standards



# Emergency Data Exchange Language (EDXL)

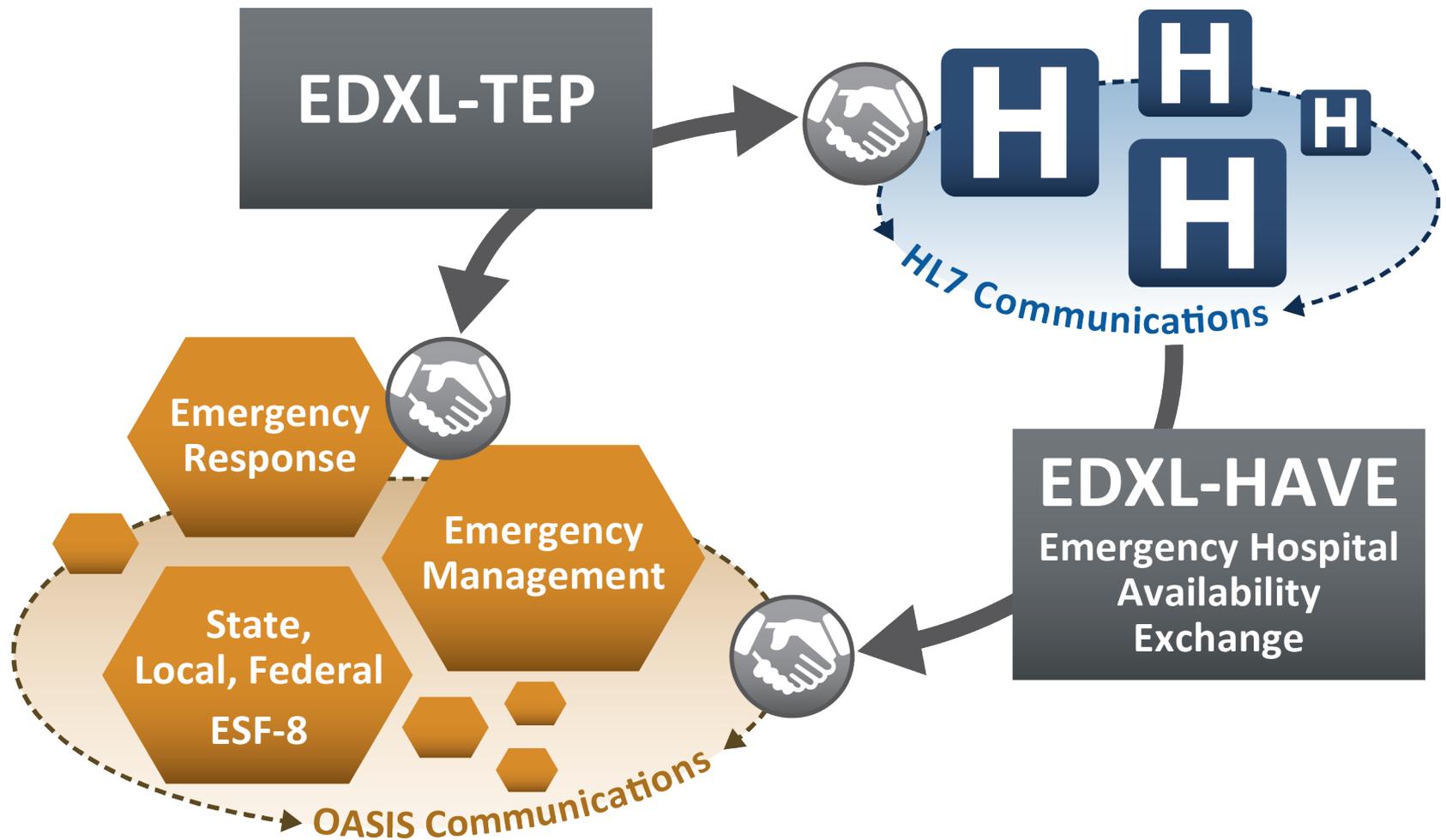
EDXL is a family of standards, providing a common language, or interface, for data exchange across emergency-related systems

- 1. Common Alerting Protocol (CAP)**
  - Emergency alerts, notifications, and public warnings
- 2. Distribution Element (EDXL-DE)**
  - Wrap and route any emergency information (XML and non-XML)
- 3. Hospital AVailability Exchange (EDXL-HAVE)**
  - Hospital status, services, resources
- 4. Tracking of Emergency Patients (EDXL-TEP)**
  - Emergency patient and EMS tracking information
- 5. Resource Messaging (EDXL-RM)**
  - Emergency resource information
- 6. Tracking of Emergency Clients (EDXL-TEC)**
  - Emergency Evacuee tracking and Shelter information
- 7. Situation Reporting (EDXL-SitRep)**
  - Situation / incident / event and response information

# EDXL Specifications for Health Care

# TEP Context

*Continuum of Patient Movement*



# Hospital Availability at the scene

OASIS 

Local System Patient Tracking

 AHRQ

Hospital Systems

H

HAvBED

1

Bed & Service Availability



Local/  
Regional  
Coordination

EDXL-DE  
EDXL-HAVE

**1** | Emergency Services monitor local hospital availability.

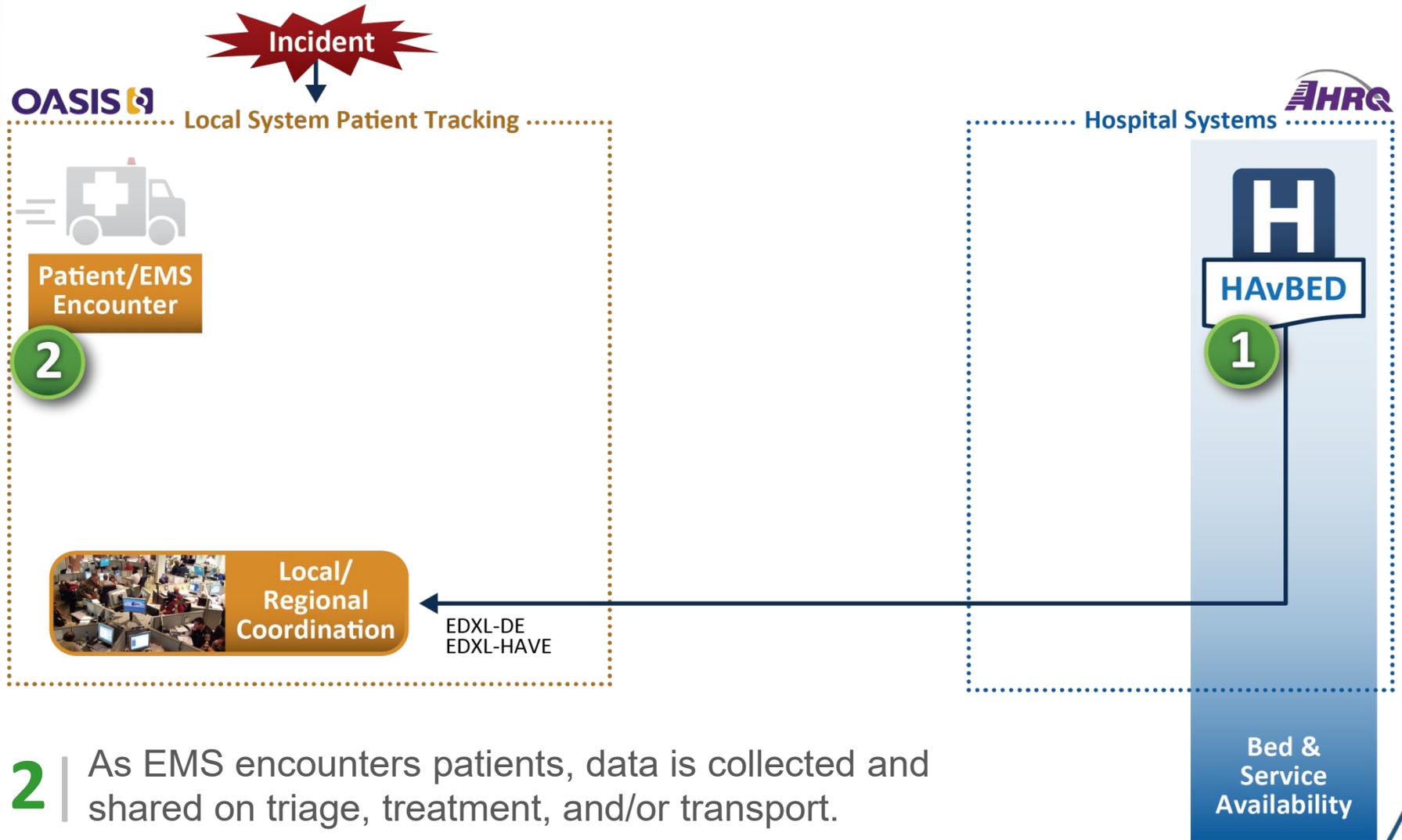
# EDXL-HAVE

## *Hospital Availability Exchange*

- EDXL-HAVE enables communication on the **status** of a hospital, its **services**, and its **resources**
- Multiple use
  - Flexible format that can be used during disasters, everyday emergencies, reporting, etc.
- Joint OASIS/HL7 work
- EDXL-HAVE 2.0
  - Incorporates additional hospital resources.
  - Addresses the exchange between
    - EDXL-based Emergency stakeholders
    - HL7 v2-based Hospital systems

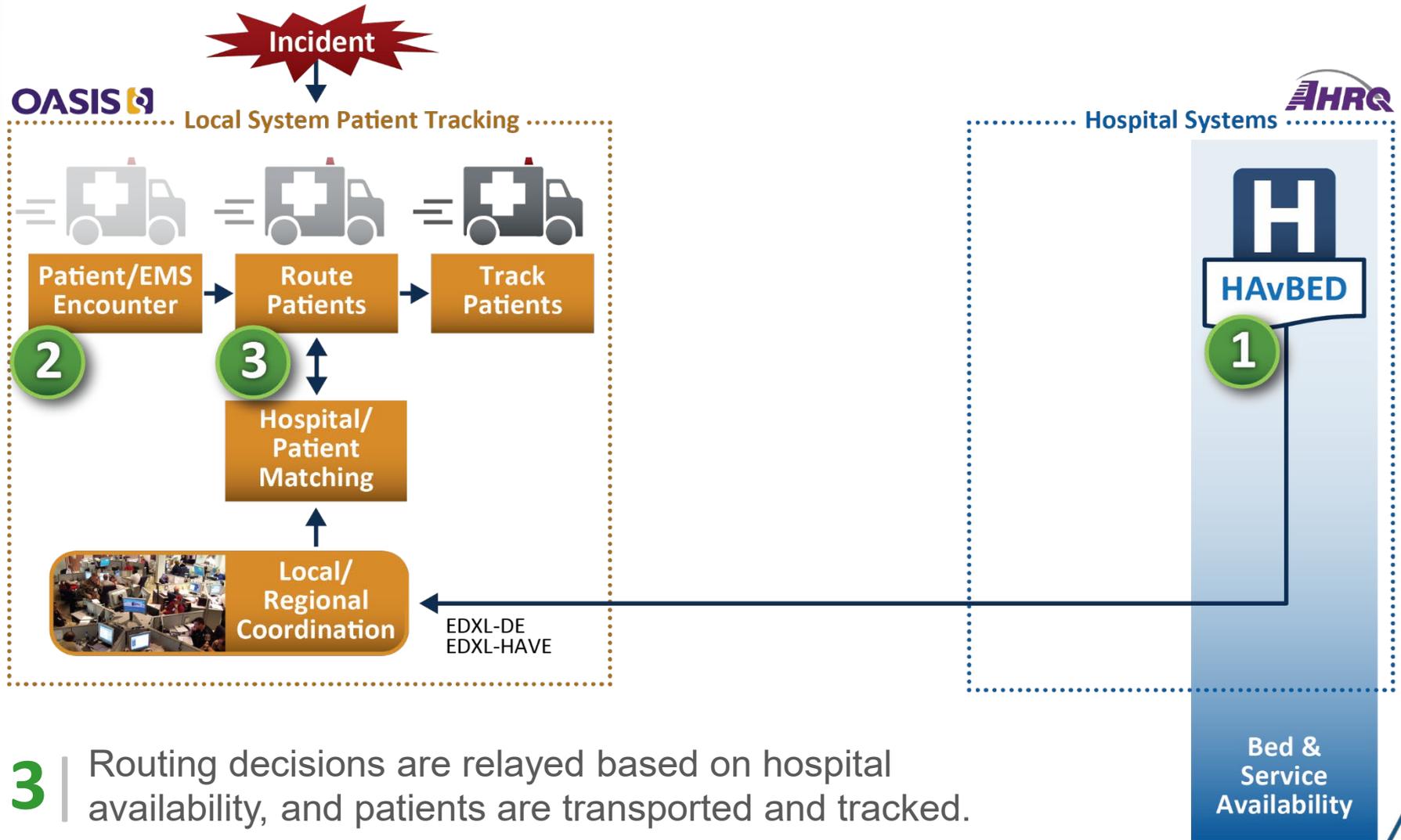


# Patient Encounter



**2** | As EMS encounters patients, data is collected and shared on triage, treatment, and/or transport.

# Patient Tracked

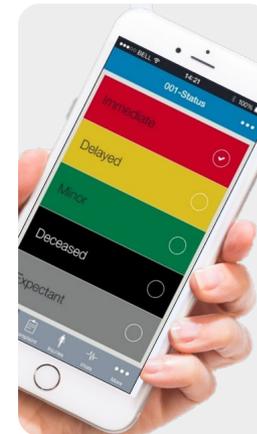


**3** | Routing decisions are relayed based on hospital availability, and patients are transported and tracked.

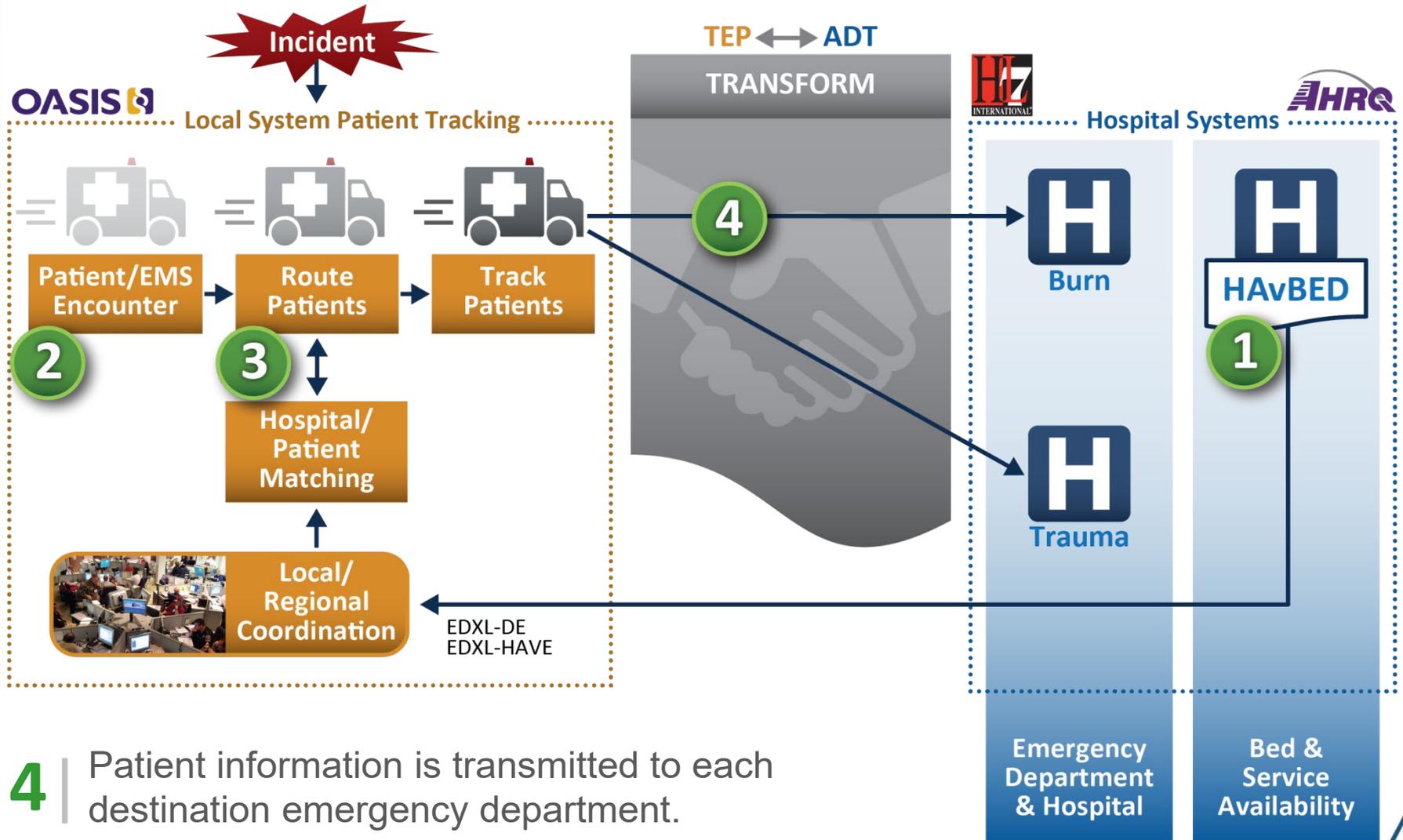
# EDXL-TEP

## *Tracking of Emergency Patients*

- Provides tracking for Emergency Medical Services (EMS) and others across the emergency medical care continuum
  - From patient encounter to patient release, hospital admission or morgue
- Can be used for all types of events
  - Day-to-day (e.g., EMS, patient transfers)
  - Mass casualty incidents
  - Hospital evacuations
- Facilitates cross-jurisdiction and cross-profession information sharing, collaboration, and coordination

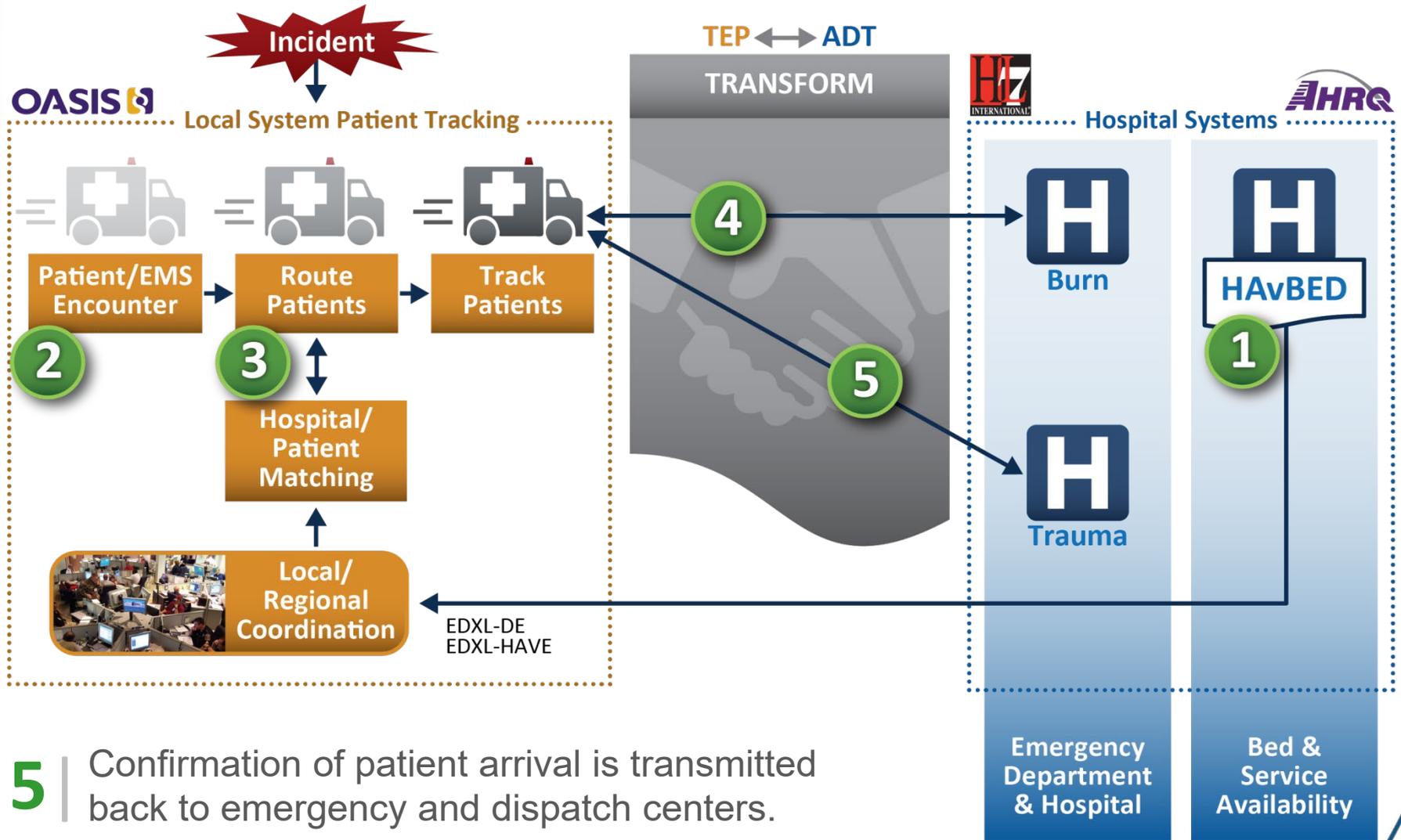


# Patient Info Sent to Emergency Doctor



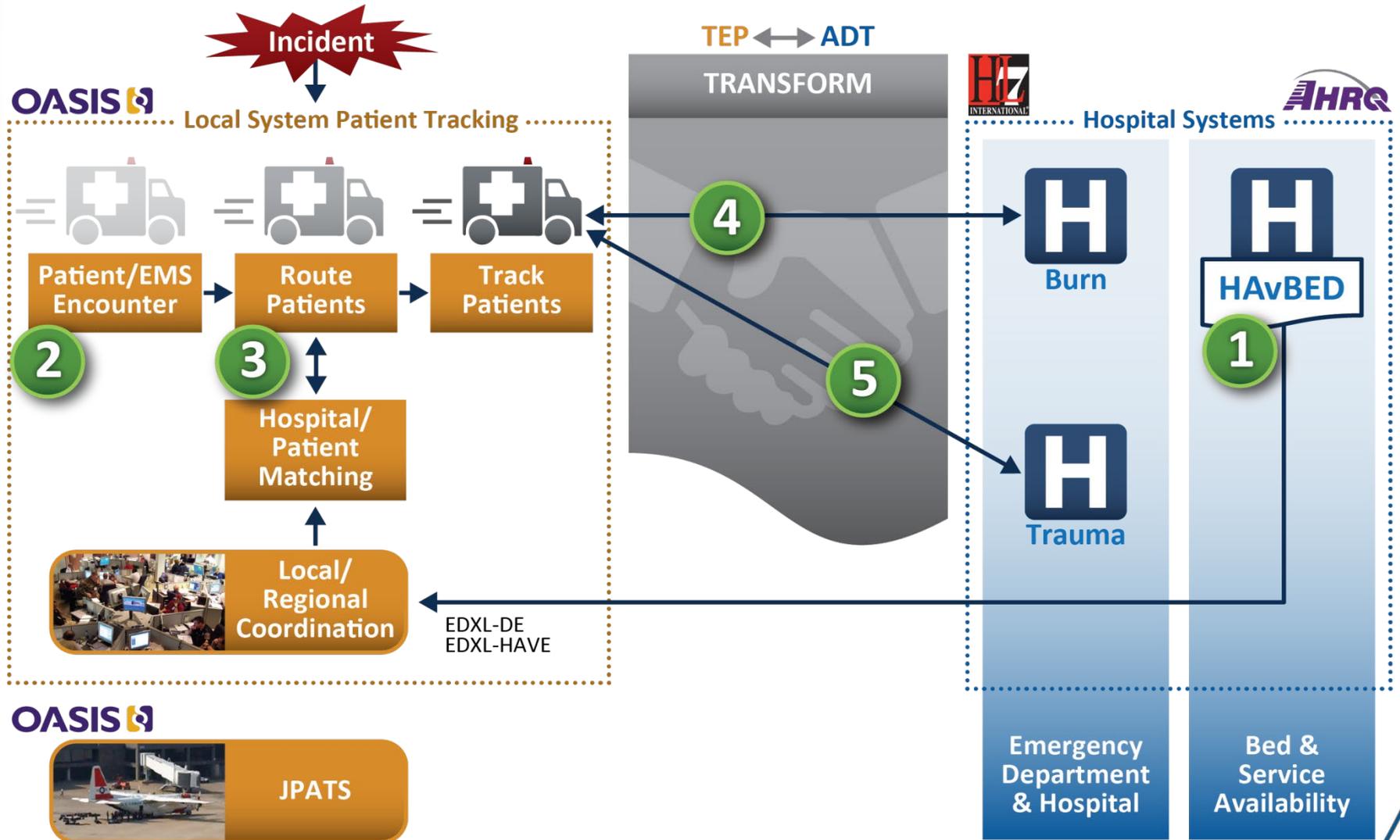
**4** | Patient information is transmitted to each destination emergency department.

# Arrival Confirmation



**5** | Confirmation of patient arrival is transmitted back to emergency and dispatch centers.

# Healthcare Interoperability Environment



# EDXL-TEP 1.1/HL7 2.7.1 ADT Transform

- **Joint effort between OASIS Emergency Management Technical Committee (EM-TC) and HL7 Public Health and Emergency Response (PHER) Working Group**
  - Data transform between OASIS EDXL-TEP 1.1 and HL7 2.7.1 Messaging
- **Bridges the electronic gap between the emergency management services and the hospital communities**
  - Bidirectional data exchange
  - Eliminates need to enter patient information received from EMS upon arrival
- **Facilitates ER preparation**
  - Tracks incoming patients from emergency services in the field
- **Used in day-to-day transfers, Mass Casualty Events (MCEs), and hospital evacuation**

# Why EDXL

- Cross-domain/jurisdiction automated, real-time data exchange
  - Eliminate manual data entry & errors
  - Consistent interface between/among providers
  - “Force Multiplier” & resource optimizer
  - Leverage existing systems
  - International
- 

# Ongoing & Upcoming Work

- EDXL Framework Toolkit
  - CAP Event Terms List Committee Note
  - Mobile Alerting Practices Guide Committee Note
  - Adoption
  - 2021 CAP Workshop
  - Strategy Project
- 

# OASIS Emergency Data Exchange Language

- **Guiding Principles for an Emergency Management Framework (EMF) using EDXL**
  1. Empower people to obtain and secure their own personal data
  2. Empower people to share information with each other in an emergency
  3. Emergencies don't respect government or organizational boundaries.
  4. Any and all levels of "emergency" response should be supported, from the national, state and local or tribal jurisdictional context.
  5. All phases of an emergency should be supported including planning, situational awareness, action, assessment and recovery.

# OASIS Emergency Data Exchange Language

## ■ Guiding Principles for an Emergency Management Framework (EMF) using EDXL

6. Smart devices should be supported by EDXL as a common language that is interoperable, flexible and extensible.
7. The modern EDXL-based EMF should include working software that includes both a front end running on smart devices and backend support services to serve as a reference implementation.
8. The EMF should be an open-source, community effort, supported by, but independent of, any third party organization or government.
9. The EMF should provide an open architecture to enable users, organizations, partners to expand support and extend the basic framework capabilities.
10. The EMF should be freely available to all at no cost.

# Resources

- OASIS EDXL Tracking of Emergency Patients:  
<https://www.oasis-open.org/standards#edxl-tep-02>
- Bi-directional transformation specification:  
[http://www.hl7.org/implement/standards/product\\_brief.cfm?product\\_id=439](http://www.hl7.org/implement/standards/product_brief.cfm?product_id=439)
- OASIS EDXL Hospital Availability Exchange:  
<https://www.oasis-open.org/standards#edxl-have-20>
- Cross paradigm implementation guide:  
[http://www.hl7.org/implement/standards/product\\_brief.cfm?product\\_id=489](http://www.hl7.org/implement/standards/product_brief.cfm?product_id=489)

# Questions



Elysa Jones, EMTC Chair  
elysajones@yahoo.com

# Actions and Next Steps



## Explore the National Resource Hub

- <https://preptoolkit.fema.gov/web/national-resource-hub>



## Review and contribute to the Resource Management Maturity Study

- <https://www.napsgfoundation.org/resources/resource-management-maturity-study-report-available/>

### Implementation Guidance:

Information Sharing Standards for Crisis Management and Mutual Aid Technology

## Access the Existing Guidance on Information Sharing Standards

- [https://www.napsgfoundation.org/wp-content/uploads/2020/09/InfoSharing\\_Guidance\\_v2\\_20200914.pdf](https://www.napsgfoundation.org/wp-content/uploads/2020/09/InfoSharing_Guidance_v2_20200914.pdf)



## Register for August 4<sup>th</sup> Member Innovations Webinar

- <http://events.r20.constantcontact.com/register/event?oeidk=a07ei7vueha2d0464b0&llr=nplxpbdab>

# Questions?

## Contact Today's Speakers

- Hank Rowland & FEMA National Integration Center: [FEMA-NIMS@fema.dhs.gov](mailto:FEMA-NIMS@fema.dhs.gov)
- Rebecca Harned: [HarnedR@4arrowsinc.com](mailto:HarnedR@4arrowsinc.com)
- Elysa Jones: [elysajones@yahoo.com](mailto:elysajones@yahoo.com)
- Charlotte Abel: [cabel@publicsafetygis.org](mailto:cabel@publicsafetygis.org)