

2019 National Mutual Aid Technology Exercise

Mutual Aid Interoperability Action Plan

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NAPSG Foundation

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I. Acknowledgements

As emergencies affecting the nation increase in complexity and resources become increasingly constrained, communities rely more on mutual aid every day to fulfill lifesaving requirements. Addressing national mutual aid issues and geospatial preparedness requires meaningful engagement of local, state, and national mutual aid stakeholders. NAPSG Foundation, the DHS Science and Technology Directorate (S&T), and several components of the Federal Emergency Management Agency (FEMA) are grateful for the invaluable contributions of time and expertise that the following agencies and organizations contributed in the planning, design, and conduct of the National Mutual Aid Technology Exercise (NMATE) conducted on August 21-22, 2019, at Kentucky State Emergency Operations Center in Frankfort, KY.

Agency or Organization
National Emergency Management Association / Emergency Management Assistance Compact
Kentucky Emergency Management, Department of Military Affairs
South Carolina Emergency Management Division
South Carolina Office of the State Fire Marshal
Texas Division of Emergency Management
California Governor’s Office of Emergency Services
City of Nashua, New Hampshire
All-Hazards Incident Management Team Association / City of El Segundo, California
Indiana Department of Homeland Security
Florida Office of the State Fire Marshal
Rutherford County Emergency Management Agency, Tennessee
International Association of Fire Chiefs
U.S. Department of Agriculture / U.S. Forest Service
Federal Emergency Management Agency Office of Response and Recovery, Response Planning and Exercise Division National Preparedness Directorate, National Integration Center Office of the Chief Information Officer FEMA Integration Team (FIT) – Montana Office of Policy and Program Analysis
U.S. Department of Homeland Security Science & Technology Directorate

NAPSG Foundation, DHS S&T, and FEMA appreciate the ongoing commitment by the homeland security/public safety and GIS community as we work together to solve key challenges with mutual aid technology, improve geospatial preparedness, and increase effectiveness in changing outcomes for survivors.

II. Executive Summary

Mutual aid is critical for unified response to and recovery from emergencies of all types and scales. Coordinating and employing mutual aid facilitates rapid activation and deployment of capabilities to affected areas. Several mutual aid, public safety, and non-governmental organizations that manage and/or provide resources have information management systems that manage planning, requesting, deploying, and tracking of resources across agencies and organizational/jurisdictional boundaries.

Currently these systems are not designed to inherently share resource or situational awareness information in real-time. Nor has a national framework or architecture been established for enabling appropriate and safe information sharing policy, operations, and technology for mission critical operations. These challenges are significant impediments to carrying out the vision for the national mutual aid system – an integrated and unified nationwide network of mutual aid systems for enhancing the Nation’s overall preparedness and resilience – as defined in the NIMS Guideline for Mutual Aid.ⁱ

To address this need - NAPSG Foundation, DHS S&T, and FEMA, brought together over 40 key stakeholders that own and/or use technology-enabled systems for resource management and mutual aid to conduct the 2019 National Mutual Aid Technology Exercise (NMATE). The exercise was designed to reassess and address key areas for improvement identified in previous exercises and efforts undertaken over the past several years.ⁱⁱ The goal of the 2019 NMATE was to demonstrate and exercise policy and technology interoperability among crisis management and mutual aid systems, through seamless exchanges of priority resource management information. The exercise supported the community’s overarching efforts to maximize the operational viability of the Nation’s investments in resource management and mutual aid technology systems.

The purpose of this Mutual Aid Interoperability Action Plan is to provide a summary of findings from the 2019 NMATE, along with the priority needs, requirements, and key actions identified. Provided below is a synopsis of the key findings:

- Several systems successfully exercised seamless exchange of relevant resource management and situational awareness information. Further, several of the participating leaders demonstrated their system’s functionality, capability enhancements, interoperability, and identified opportunities for improvement.
- 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 always interoperable, sometimes resulting in operational challenges.
- A common need was identified for a nation-wide strategy and course of action to unify resource management and mutual aid policy, technology, and operations.

- One overarching question permeated the exercise discussions: How do we unify and streamline resource management policies and technologies to achieve better coordination and smoother operations during incidents requiring mutual aid?

To support integration efforts that build a national mutual aid network, the following key actions were identified:

1. Conduct an operational needs assessment to determine the policy and technology requirements for resource management interoperability, across all levels of government and the full spectrum of mutual aid.
2. Update policies, technologies, and support integration efforts that build a national mutual aid network – an integrated and unified nationwide network of mutual aid systems for enhancing the Nation’s overall preparedness and resilience.
3. Establish a NIMS-related Work Group that serves as the leading forum for fostering collaboration and providing thought leadership in the development of updated and new resource management policy, technology, and integration efforts.

III. Exercise Overview

Name of the Exercise

National Mutual Aid Technology Exercise

Type of Exercise

Hybrid functional and discussion-based (tabletop) exercise

Exercise Date

August 21 – 22, 2019

Duration

13 hours (0830-1630 day 1 & 0830 – 1430 day 2)

Location

Kentucky State Emergency Operations Center
110 Minuteman Parkway,
Boone National Guard Center,
Frankfort, KY 40601

Scenario Type

Resource management preparedness and the request & deployment of resources during wildland fire incidents impacting California and Texas, with a simultaneous tropical storm on the eastern seaboard. Scenarios were developed based on historic incidents.

Exercise Planning and Conduct Team

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IV. Exercise Summary

The information provided below presents a summary of the National Mutual Aid Technology Exercise (NMATE). For additional detail on exercise design or the scenario, refer to the National Mutual Aid Technology Exercise Situation Manual (SITMAN).ⁱⁱⁱ

Background

The exercise scenarios were based on multiple large-scale events occurring at the same time, creating a need for resources in multiple locations across the country. Events of this type, scale, and complexity would require response and recovery to be supported by resources at the local, state, and National levels in both affected and unaffected areas. This level of resource request, deployment, and management necessitates coordination and information sharing across the full spectrum of mutual aid consistent with the National Incident Management System (NIMS)^{iv}.

The NMATE concept was conceived in May 2016 at the Mutual Aid Technology Meeting and it continued, as stakeholders have participated in conference calls and at the Mutual Aid Information Requirements Work Session conducted in December 2016. However, the idea for NMATE has its genesis in the Strong Angel concept from 1999, when an informal consortium of agencies hosted a series of demonstrations leveraging public-private collaboration within a complex disaster response scenario. NMATE reflects the evolution of this idea with a focus on domestic technology interoperability and information exchange capabilities.

The NMATE design guided players to identify specific thresholds needed for mutual aid system integration and information sharing to support effective and efficient operational coordination. Participants and players discussed effects of the event and tested sharing of situational awareness and resource information across jurisdictions, agencies, organizations, and systems.

NMATE 2019 built on existing momentum from the past few years to enhance and improve resource management information sharing across crisis management and mutual aid systems used for all types and scales of incidents.

Exercise Goal, Objectives, and Outcomes

Goal

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

Objectives

Mutual aid operations are an essential component of successful disaster operations needed to stabilize communities and meet the needs of survivors affected by a disaster. NMATE was an opportunity to collectively:

1. Establish and coordinate dialogue and collaboration among the owners and users of technology-enabled crisis management and mutual aid systems available today.
2. Bring leaders, operators, and technologists together in a no-fault environment to demonstrate and exercise interoperability among crisis management and mutual aid technology-enabled systems.
3. Identify ongoing challenges and technology requirements needed to support multi-jurisdictional and/or cross-discipline mutual aid operations.
4. Exercise and attempt to resolve policy and technical interoperability issues in real-time.
5. Capture and compile interoperability and information sharing: successes, challenges, and corrective actions.

Outcomes

This exercise focused on achieving the following outcomes:

- Establish a shared understanding of current and emerging policy and technology interoperability between crisis management and mutual aid systems.
- Improve collaboration across mutual aid providers and system owners – decision makers, operators, technologists.
- Define policy requirements to enable improved information sharing and interoperability among agencies, organizations, and their systems.
- Develop crisis management mutual aid technology guidance for sharing real-time information to support mutual aid resource management, situational awareness, and interoperability.
- Document un-met needs, emerging requirements, corrective actions, and solutions for further exploration.

Participants

Provided below is a list of agencies and organizations and their respective mutual aid technology systems that participated in this exercise. Each agency/organization team consisted of individuals capable of filling the following roles:

- **System Technician/Technologist:** Individuals in this role can discuss their system's architecture and limitations, make just-in-time adjustments to address immediate

interoperability during exercise play, and make recommendations for near/long-term enhancements.

- **Operator/Operations Specialist:** Individuals in this role can fully use and operate their system and provide public safety operational insight to mutual aid business practices, procedures, and/or policies of the system owner.
- **Leader/Decision Maker/Commander:** Individuals in this role can provide insight and recommendations regarding deployment, employment, and adjudication of resources requested/provided as well as inform unified mutual aid smart practices, procedures, and/or validate information exchange requirements.

Participating Agencies and Systems

Agency/Organization	Mutual Aid Technology or System Name
National Emergency Management Association Emergency Management Assistance Compact	<ul style="list-style-type: none"> • Mutual Aid Support System • Emergency Operations System
Kentucky Emergency Management, Department of Military Affairs	<ul style="list-style-type: none"> • KY WebEOC – Juvare Exchange – AGOL • Lifeline Dashboards
South Carolina Emergency Management Division South Carolina Office of the State Fire Marshal	<ul style="list-style-type: none"> • Palmetto
Texas Division of Emergency Management	<ul style="list-style-type: none"> • Texas Fusion
California Governor’s Office of Emergency Services	<ul style="list-style-type: none"> • SCOUT • WebEOC with AGOL Extension • Lifeline Dashboards
City of Nashua, New Hampshire Emergency Management	<ul style="list-style-type: none"> • Local resource management practices and systems
All-Hazards Incident Management Team Association City of El Segundo, California	<ul style="list-style-type: none"> • Local Implementation of One Responder
International Association of Fire Chiefs	<ul style="list-style-type: none"> • National Mutual Aid System
Rutherford County Emergency Management Agency, Tennessee / State ESF 4/9 Coordinator	<ul style="list-style-type: none"> • National Mutual Aid System
Florida Office of the State Fire Marshal / State ESF 4/9 Coordinator	<ul style="list-style-type: none"> • National Mutual Aid System
USDA/US Forest Service	<ul style="list-style-type: none"> • Resource Ordering and Status System (ROSS) - IROC • IRWIN
Federal Emergency Management Agency Office of Response and Recovery	<ul style="list-style-type: none"> • Crisis Management - WebEOC for HQ and Region
Federal Emergency Management Agency National Preparedness Directorate	<ul style="list-style-type: none"> • Incident Resource Inventory System (IRIS) • Resource Typing Library Tool (RTLTL) • One Responder

Observing Agencies and Organizations

Agency/Organization	Related Effort
Federal Emergency Management Agency	<ul style="list-style-type: none"> • Office of Response and Recovery, Response Planning and Exercise Division • National Preparedness Directorate, National Integration Center • Office of the Chief Information Officer • FEMA Integration Team (FIT) – Montana • Office of Policy and Program Analysis
Department of Homeland Security	<ul style="list-style-type: none"> • Science & Technology Directorate
Indiana Department of Homeland Security	<ul style="list-style-type: none"> • Office of the Chief Operating Officer

Exercise Structure

The exercise was designed as a technically-oriented functional exercise and tabletop discussion for all participants and observers across all disciplines and roles. It was designed to go beyond discussions and provide an environment for developing, testing, and examining potential solutions. Exercise discussions were designed and facilitated to define specific next steps for strengthening mutual aid policy, technology, and business practices.

Venue Layout

The exercise was conducted in one large room that simulates an Emergency Operations Center (EOC) environment. Participants were pre-assigned sections and seats based on their organization and role. The Master Control Cell managed the screens at the front of the room for the sharing of applications and information.

Scenario and Simulation

The exercise was based on multiple scenarios with all participants receiving injects through information on the large screens. The scenarios were not the focus of the exercise; they merely provided incident context to stimulate discussion and inform the use of mutual aid systems.

The exercise and scenarios were designed to achieve a basic level of simulation. Injects and role players (facilitators) simulated multiple agencies based on those likely to be involved in the incident scenario. The exercise was designed to be technology agnostic and be applicable to any threat or hazard. Each participant simulated their own agency or organization using their

existing mutual aid and resource management technology system(s), policies, and practices throughout the exercise.

Exercise and demonstration activities explored information-sharing needs for unified mutual aid and resource management decision-making across five key Resource Categories, Emergency Support Functions (ESFs), and Community Lifelines:

Resource Category	Emergency Support Function	Community Lifeline
Incident Management	ESF 5: Information and Planning	Safety and Security
Firefighting	ESF 4: Firefighting	Safety and Security
Search and Rescue	ESF 9: Search and Rescue	Safety and Security
Public Works	ESF 3: Public Works and Engineering	Safety and Security
Mass Care Services	ESF 6: Mass Care, Emergency Assistance, Temporary Housing and Human Services	Food, Water, and Sheltering

In support of exploring these five Resource Category, ESF, and Lifeline groupings, the exercise was built upon concurrent wildfire and hurricane scenarios. Wildfires in California and Texas occurred simultaneously with a large Tropical Storm forming off the Southeastern seaboard with hurricane force winds. The tropical storm was forecasted to make landfall in Florida, Georgia, and South Carolina, bringing high precipitation and flooding into Tennessee and Kentucky.



Phase 1

- Preparedness phase for large-scale and catastrophic incidents.
- Local response in effect for California and Texas Wildfires.

Phase 2

- Local to state-level response in effect for California and Texas wildfires. Evacuations issued and sheltering operations in effect.
- Southeastern states begin to plan and pre-stage intrastate resources for response to tropical storm.

Phase 3

- Wildfire response escalates, requiring support by USFS and interstate mutual aid.
- Tropical storm makes landfall. Governors declare state of emergency in Southeastern states.
- Southeastern states in full-scale response, fully expending available resources at the intrastate level and scaling to interstate aid.
- Both wildfires and tropical storm receive Federal disaster declarations.

Phase 4

- Tropical storm response operations continue and transition to initial recovery.
- High precipitation and flooding conditions in Tennessee and Kentucky.

Exercise Assumptions and Guidelines

Participants were requested to follow the following ground rules and assumptions throughout the exercise.

- **Definition of policy for the purpose of NMATE**
 - Policy refers to a course or principle of action adopted or proposed by an agency or organization.
 - Policy can take the form of guidance, guidelines, directives, legislation, doctrine, memorandums of agreement or understanding, and standards. Different entities can choose policy tools and mechanisms appropriate for their organization and constituencies.
- **“No-fault” environment**

There were no hidden agendas, trick tasks, or trick questions posed during the exercise. This exercise provided a no-fault environment for participants to come together with their existing technology systems. Many systems were developed prior to the availability of open standards and use legacy governance structures and business practices.

- **Open and focused discussions on appropriate topics related to exercise objectives**

This was a safe environment for sharing information about systems, including any technical limitations or architecture considerations. Asking questions, sharing thoughts, and offering forward-looking, problem-solving suggestions were strongly encouraged to enhance participants' exercise experience.

- **Focused comments and consideration of time constraints**

As in any exercise, the following assumptions were necessary to complete discussions in the time allotted:

- The scenario and likely effects to the communities and surrounding area(s) were plausible, and events occurred as they were presented.
- Participants were asked to place certain issues and discussions in a “parking lot” due to time constraints.

V. Current State of Affairs

Success and Challenges in Sharing Resource Information for Mutual Aid

Participants identified successes and challenges in sharing resource management information for mutual aid operations. These successes and challenges informed the overarching needs identified above and the items outlined in the action plan contained in this report.

Top Successes and Best Practices in Policy, Operations, and Technology



Policy

1. Mutual aid operations are efficient and well managed on a daily basis, at the local level.
2. Successful case studies and best practices in resource management information sharing may serve as the basis for a national resource management information sharing architecture and framework.
 - a. The U.S. Forest Service architecture for resource management systems integration, interoperability, and data sharing across all levels of government is an emerging national model and best practice.
 - b. The Central United States Earthquake Consortium (CUSEC) Regional Data Sharing platform is a notable regional case study and potential best practice.
3. NIMS Resource Typing and the National Qualification System (NQS) serve as a cohesive foundation for resource management information sharing and has contributed to successful mutual aid operations.



Operations

1. Daily use of resource management technology and mutual aid systems is fostering success in the larger incidents.
2. Tracking and reporting resource management and situational awareness data to the Community Lifelines allows data to be viewed as information and empowers better decision making.
3. Those in command during complex incidents have a better understanding today of the value and use of data to inform operational decision making.



Technology

1. Ability to share a subset of data (i.e., maintain control over sharing) is essential to fostering appropriate and safe data sharing relevant to mutual aid operations. Several agencies and systems demonstrated technical interoperability during the exercise, specifically the following:

- a. Kentucky Division of Emergency Management, South Carolina Division of Emergency Management, California Governor’s Office of Emergency Services, and the IAFC’s National Mutual Aid System (NMAS) were all able to consume resource inventories provided as REST services. These agencies were able to visualize the resource data within their respective systems to support resource management decisions.
 - b. Kentucky Division of Emergency Management, South Carolina Division of Emergency Management, and the California Governor’s Office of Emergency Services were able to consume a dynamic live service from NMAS and were able to visualize the NMAS data in real-time within their respective systems.
 - c. Integration of shared data was limited to data visualization and basic analysis within the systems listed above. There was no attempt to directly connect resource databases, which would be necessary to deconflict any double or triple counting of resources. This should be explored further and potentially exercised in future NMATE exercises.
2. Standards-based systems can readily consume both static and dynamic resource management and situational awareness information in real-time and on the fly as needed.
 3. Systems are now more user friendly, thus requiring less training and allowing operators to use them more effectively.
 4. With proper policies and procedures, current technology has the capability to provide full interoperability within mutual aid systems.

Top Challenges and Gaps in Policy, Operations, and Technology

x Policy

1. The nation needs a cohesive resource management information exchange framework and guidance to support appropriate information sharing in support of mutual aid operations.
 - a. The framework must have an adaptable design that can be implemented across all stakeholders and the full spectrum of mutual aid.
 - b. Conflicting policies (and policy gaps) at different levels of government hinder interoperability.
2. Policies need to be reviewed and updated to ensure they are keeping pace with operational needs and technology capabilities in support of business and operational requirements.

- a. Need for consistent and wide-scale adoption of existing information sharing and cyber security standards.
- b. Agreement is needed on which attributes for resource data need to be shared to support appropriate and safe information sharing.
3. Increased outreach, education, and implementation of standardized NIMS resource typing, inventorying, mission ready packaging, and the NQS at the local level.
 - a. Need for guidance on how to type resources that are either not addressed by or don't meet minimum criteria defined in existing NIMS resource typing definitions and position qualification sheets.
 - b. Need for guidance and education on how to use NIMS resource typing definitions and the national qualification system as the foundation for developing mission ready packages.

✘ Operations

1. Mutual aid operations in medium and large-scale incidents continue to face challenges in the double and triple counting of resources, often leading to confusion and extended time in determining resource availability.
2. Local agencies need a better justification for using and maintaining their resource inventories.
3. Mutual aid processes need to be driven foremost by operational needs. Mutual aid processes are often driven from the top down, by people who often do not own the resources and do not understand ground-level operations.
4. State-level resource inventorying and operational tracking needs to be improved before it is deployed.

✘ Technology

1. There are gaps in technology policy to support interoperability and information exchange among technologies.
2. There are gaps in existing standards needed to support consistent and interoperable resource management information sharing.
3. There are gaps in defining how cyber security and data safeguarding protocol apply to mutual aid and crisis management systems.
 - a. Need for research on and guidance to be developed on standardized cyber security protocols and data safeguarding for mutual aid and crisis management systems.
4. Large amounts of data are available, often resulting in information overload by operators and decision makers.

- a. Operational requirements need to be communicated to technologists so that the most relevant and actionable data can be analyzed and provided to operators and decision makers.
5. The lack of a unified, nation-wide resource management information sharing framework is leading to disparate technologies that are either: not appropriately connected to share data or are not technologically interoperable.
 - a. Both the US Forest Service/Department of Interior and the CUSEC architectures may serve as starting points for this framework.

Areas for Improvement/ Priorities

Information Sharing

Participants answered the following question: How does information sharing need to be established and/or improved to support better/faster mutual aid operations?

- Resource tracking must begin when the resource is initially deployed, regardless of the type of operations (day-to-day, regional mutual aid, etc.). This ensures that tracking is established and can continue to build when and if the event reaches a critical stage.
- The current lack of information sharing forces individuals to work around and outside the system(s) – creating inconsistencies that can lead to double or triple resource counting, errors, and delays in resource deployment.
 - Cohesive unit ID standardization and incident naming could help alleviate some of these double or triple counting of resources.
- Standardized resource identification number system for assigning unique identifiers to each resource, for mitigating some double or triple counting of resources.
- Operators need to identify thresholds that trigger information collection and/or information sharing.

Policy and Governance

Participants answered the following question: How does policy and governance need to be established and/or improved to support better/faster mutual aid operations?

- Form a NIMS-related Working Group focused on resource management policy, technology, data sharing and exchange, and interoperability.
- Define and establish policies to enable appropriate interoperability and information sharing.
- Develop guidance as part of the NIMS program to allow for modified resource requests and typing.

VI. NMATE Outcomes

NMATE participants agreed that current mutual aid and resource management capabilities support effective resource management for life saving missions; however, these capabilities may not be the most effective and/or efficient.

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.

Primary Issues

Time and consistency were identified as two main hindrances to unified mutual aid and information sharing.

- **Time:** Time is required to create an effective program or system. The desire for quick wins hinders progress on a wholistic strategy and set of solutions.
- **Consistency:** Continually changing leadership, different goals and metrics, and inconsistent policies create instability and a lack of common resource management practices and mutual aid operations. This leads to vastly different policies, operations, and technologies among agencies, which hinders interoperability among capabilities.

Primary Needs

- **Policies and guidance that address operational needs and enable appropriate data sharing** across the full spectrum of mutual aid.
- **Standards and guidelines that address identified gaps and** accommodate for the diversity of unique policy and operational considerations at the local level nation-wide.
- An **information sharing framework and hub for resource management and mutual aid** to be widely adopted and used across all levels of government and mutual aid partner organizations nation-wide.

- Clear definition and adoption of a **basic, minimum set of attributes** (or standard data schema) for resource data to form the basis for appropriate, safe, and effective information sharing.
- Clearly defined and **consistent metrics and analysis methodology** for using shared and aggregated resource management information across all levels of government to support a variety of operational needs and senior-level decision making.
- A **unified implementation strategy** for resource management and mutual aid policy and technology that is consistent, yet flexible and scalable to the unique considerations at the local and state levels nationwide.

Key Identified Actions

1. Conduct an operational needs assessment to determine common policy and technology requirements for resource management interoperability, across all levels of government and the full spectrum of mutual aid.
2. Update policies, technologies, and support integration efforts that build a national mutual aid network – an integrated and unified nationwide network of mutual aid systems for enhancing the Nation’s overall preparedness and resilience.
3. Establish a NIMS-related Work Group that serves as the leading forum for fostering collaboration and providing thought leadership in the development of updated and new resource management policy, technology, and integration efforts.

National Requirements for Enabling Success

- Cooperation: Mutual aid only works if we all work together.
- Shared Vision: Interoperability for more effective mutual aid operations.
- Education/Training: Common knowledge and skills in managing resources.

Developing a Cohesive and Unified Strategy

The common vision shared by participants is in building a national mutual aid network – an integrated and unified nationwide network of mutual aid systems for enhancing the Nation’s overall preparedness and resilience. Together we can work towards this vision by developing a unified strategy and course of action that is supported and implemented by all mutual aid partners. To develop this course of action, a NIMS-related Work Group(s) should be established that are focused on resource management technology, mutual aid planning, and other relevant focus areas necessary. Both the work group(s) and the course of action should avoid a top-down or bottom-up structure and should take a hub-and-spoke approach, convening all mutual aid stakeholders on common ground. When creating a unified strategy and course of action for interoperable mutual aid, the following parameters should be considered:

1. Effective mutual aid operations need to be driven by operational needs and requirements that positively change the outcomes of the event.
2. An operational needs and requirements assessment should be conducted and serve as the foundation for developing the cohesive and unified strategy for national mutual aid interoperability.
3. Mutual aid operational needs at the local and state levels should be the primary driver of related policy. Technology-related requirements and policy should be driven by those operational requirements. This sequence is critical to success.

VII. Action Plan

Identified Goals & Actions	Lead
<p>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.</p>	<p>NAPSG, FEMA, DHS S&T in partnership with a NIMS Technology Sub-Group</p>
<p>Form NIMS-related Work Group(s) focused on technology, mutual aid planning, and other relevant themes.</p>	<p>NAPSG, FEMA, DHS S&T in partnership with a NIMS Technology Sub-Group</p>
<p>Conduct an operational needs assessment to determine common policy and technology requirements for resource management interoperability</p>	<p>NAPSG, FEMA, DHS S&T with the NIMS Technology and Resource Management Sub-Groups</p>
<p>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.</p>	<p>NIMS Technology Sub-Group in partnership with any other sub-groups</p>
<p>Define minimum set of attributes for resource management information (information collection minimums or common data schema) across systems to enable information sharing standards for effective mutual aid interoperability.</p>	<p>NIMS Technology Sub-Group in partnership with any other sub-groups</p>
<p>Establish guidance within the NIMS program to allow for modified resource requests and typing of resources that either: don't have an existing standard definition or don't meet minimum standards / criteria.</p>	<p>FEMA with the appropriate NIMS sub-groups</p>
<p>Develop and release guidance on cyber security and data safeguarding for mutual aid and crisis management systems.</p>	<p>NIMS Technology Sub-Group in coordination with FEMA OCIO and the Data Governance Council</p>

Identified Goals & Actions	Lead
<p>Develop course of action to address gaps in standards needed to support consistent and interoperable resource management information sharing.</p>	<p>DHS S&T with FEMA and NAPSG</p>
<p>Establish a standardized resource identification number system and incident naming/numbering convention as an initial step towards reducing the double and triple counting of resources across resource management and mutual aid systems.</p>	<p>NIMS Technology and Resource Management Sub-Groups in partnership with FEMA, DHS S&T, and USFS</p>
<p>Develop and establish a standard set of thresholds for triggering automatic information collection and/or information sharing.</p>	<p>NIMS Sub-Group in partnership with FEMA NIC and others</p>
<p>Create incentives to promote better resource typing, inventorying, and the national qualification system at the local level.</p>	<p>FEMA in partnership with NIMS Resource Management Sub-Group</p>
<p>Define Key Performance Indicators and metrics for resource management to better prioritize and operationalize the vast amount of incoming data.</p>	<p>NIMS Resource Management Sub-Group in coordination with FEMA and NAPSG</p>
<p>Plan and conduct a damage assessment workshop to define best practices in field data collection, reducing duplication of effort, safe and appropriate sharing of field collected damage assessment data, and other key related issues.</p>	<p>FEMA, DHS S&T, and all relevant partners; including multiple FEMA components and the Data Governance Council</p>

VIII. End Notes

ⁱ Federal Emergency Management Agency. *NIMS Guideline for Mutual Aid*. (November 2017)

<https://www.fema.gov/media-library-data/1510231079545-1fab7af0e06d89d8c79c7b619e55a03/NIMS_Mutual_Aid_Guideline_20171105_508_compliant.pdf>

ⁱⁱ National Alliance for Public Safety GIS Foundation, *2017 National Mutual Aid Technology Exercise After-Action Report and Improvement Plan*. (December 2017)

< <https://www.napsgfoundation.org/all-resources/standard-operating-guide-templates/>>

ⁱⁱⁱ National Alliance for Public Safety GIS Foundation, *Situation Manual: National Mutual Aid Technology Exercise*. (August 2019)

^{iv} Federal Emergency Management Agency, *National Incident Management System*. (October 2017)

<https://www.fema.gov/media-library-data/1508151197225-ced8c60378c3936adb92c1a3ee6f6564/FINAL_NIMS_2017.pdf>