Recommended Technological Capabilities for Emergency Coordination / Operations Centers (ECC/EOC)

This document was developed by the International Association of Emergency Managers (IAEM) Emerging Technology Caucus (ETC). All of the equipment and systems listed are intended to be interoperable with affiliated local, regional, and state systems whenever possible. For local agencies unable to procure individually-owned or licensed systems, we recommend regionalization of resources and assets.

VERSION 2.0

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ELECTRONIC SITUATIONAL AWARENESS DISPLAYS

Description: EOC displays should be able to show a wide variety of content from an even wider range of sources in order to illustrate relevant information to gathered members.

BASELINE CAPABILITIES:

- Live video feeds (traffic cameras, security/surveillance cameras)
- Resource status (shelters, displaced persons, responders, assets, etc.)
- Aggregate real-time weather, flood-stage, data into graphs / charts
- Situational Awareness from varying sources (TV/radio/print media, social media, two-way radios, team reports)
- Automatically time / date stamp each post in 24-hour format with clock synchronization

- Position-specific (Emergency Support Function / role) user profile within Incident Management application
- Access to electronic situational awareness dashboard on mobile devices
- Access to region-wide electronic situational awareness dashboards
- Hosting servers should be redundant (fail-over or cloned), if not remote / cloud hosted

DATA ANALYSIS

Description: EOC data analysis involves the collection, storage, aggregation and presentation of a wide variety of inputs in ways that support EOC members to make timely and informed decisions. Data analysis can be manual, automated or a combination.

BASELINE CAPABILITIES:

- Access to varying data feeds (weather, geological activity, traffic flow, damage assessment)
- Manual report generation based on established templates
- Analysis across multiple media platforms
- Track and/or aggregate times and costs subject to potential reimbursement

- Aggregate data feeds into centralized database (weather, geological activity, traffic flow, damage assessment)
- Visibility into public health system(s) that looks for outbreak trends (through partnership with public health entities)
- Automated report generation based on aggregate data
- Multi-platform social media tool with advanced search and analysis capabilities (geolocation, keyword heatmaps, "reach" estimation)
- Real-time sensor analysis
- Utilize VOST or similar teams to gather open source data

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Description: GIS, or similar, provides data-driven maps that (1) aide in decision-making and (2) provide visual situational awareness. GIS technicians work from a set of existing layers and add incident-specific data to produce point-in-time, real-time and/or predictive maps.

BASELINE CAPABILITIES:

- Current maps, printed or digital, of the jurisdiction area (aerial images should be current within three years)
- Manual plume / impact-area modeling
- Data-layers include streets / highways, jurisdictional boundaries, major population centers, topography, utility lines / sources
- A core set of local layers

- Automated plume / impact-area modeling based on data feeds
- Data-layers include prioritized traffic routes, critical infrastructure, socio-demographics, utility lines / sources, internal floor plans for buildings within the jurisdiction
- Visualization of social media data
- Incident-specific mapping (resource assignments/status, perimeters, shelters, bases, evacuation routes, closures, etc.)
- Maps that can be tailored for multiple audiences
- On-Site GIS Technician
- On-Site plotter
- Adequate supply of plotter paper and supplies on hand

RESOURCE TRACKING FOR PERSONNEL AND ASSETS

Description: This capability utilizing mechanisms to completely and accurately track the people and assets, from request through demobilization. Methods will likely vary from manual to automated, but all should be well managed and discoverable on demand.

BASELINE CAPABILITIES:

- Ability to track assets from request through deployment to demobilization (physical equipment, consumable materials, personnel)
- All entries tagged with designated mission/task number
- Unique identifier for each asset
- National Incident Management System (NIMS) typing with standardized nomenclature
- Utilize a sign-in and sign-out system for all responders; create a simple visual identification, where needed

- Geocoded assets with map overlay
- Asset input and tracking via electronic means
- Ability for assets to check-in and check-out of the response site with real-time updates to a viewable database
- Ability to print an incident-specific badge with needed information (expiration date/time, authorized areas of entry, etc.)
- Utilize an electronic system for tracking personnel including volunteers
- FEMA reimbursement cost code

SITUATIONAL AWARENESS SOURCES

Description: Sources of situational awareness vary by incident and locale, but sources are always available. This capability involves the initial and ongoing identification of sources that will be analyzed and shared within the EOC

BASELINE CAPABILITIES:

- Photographs and Videos with relevant metadata (GPS coordinates, date/time stamp, etc.)
- Security/surveillance camera/video network with local feeds
- Geographic Information Systems (GIS) with relevant local layers
- Alerts via open-source online platforms (notification of appearance of keywords in articles or press-releases)
- All surveillance data recorded for compliance with local / jurisdictional public disclosure and privacy laws
- Over the Air TV Antenna
- Cable TV or Satellite TV

- Security/surveillance camera/video network with regional/statewide feeds
- Control over local closed circuit camera / video network
- Geographic Information Systems (GIS) with relevant regional/statewide layers
- Access to partner situational awareness and monitoring systems
- Social Media Feeds
- Outage Data
- UAV and Airborne platform imagery
- Public reports
- Live Streams
- Recorded phone lines and two-way radio traffic with an archive of the entire incident
- Recorded and archived EOC briefings
- Access to partner situational awareness and monitoring systems

Description: Participants operating within an EOC need reliable, sustained communications capabilities with responders, partner EOCs and various fixed and mobile facilities. This section outlined technologies to support these capabilities.

BASELINE CAPABILITIES:

- Electronic file sharing/distribution (reference materials, briefings, photos/videos)
- Radio communication between affiliated agencies throughout the community
- Memorandum of Agreement (MOA) with appropriate organizations to provide emergency communications support
- POTS phone line (separate and distinct from day-to-day phone system)
- One wired phone per EOC role
- Video conference system between EOC and executive / elected officials and Joint Information Center (JIC) and Incident site
- Video conference system with microphone capabilities for key EOC positions
- Emergency notification system with pre-populated contact groups for rapid notification
- Internet through a simple guest WiFi access point system. Provides uniform coverage throughout the space and has capacity to support the number of staff during full activation.
- Secondary internet source
- On-site or access to local and regional amateur radio-based communications

- Radio communication between affiliated agencies throughout the region
- Agency-assigned cellular phones for on-call staff
- Government Emergency Telecommunications Services (GETS) Cards
- Wireless Priority Service (WPS) cards
- E-mail with Encryption
- Satellite communications (e.g. radio, telephony, data)
- One wired phone per EOC seat
- Encrypted data-transfer service
- Digital patch-panels (ties together feeds from radios and phones)
- Video conferencing from mobile devices with first responders
- Emergency notification system with geographic / jurisdictional alerts, mobile application for on-call staff, and disruptive tech to encourage evacuation
- Message customization to self-identified communications needs (language preference, sensory impairments)
- Video conference system with microphone capabilities for all EOC positions
- At initial entry to EOC register all user info (cell number, email) for master contact list for event
- Internet through a simple guest WiFi access point system. Provides uniform coverage throughout the space and has a capacity to support three (3) times the number of staff during full activation.

- Secondary dedicated internet service provider
- On-site capabilities for local, regional and long-range amateur radio-based communications

COMPUTING, AUDIO/VISUAL TECHNOLOGIES

Description: An Emergency Operations Center relies on technology to support the team's activities. These technologies enable real-time collaboration, receiving and analyzing intelligence and enabling communications with response partners and the impacted community.

BASELINE CAPABILITIES:

- Ability to project pre-designated computers onto a display
- At least one computer (mobile or console) available for each represented position / role
- Color printer with standard-sized paper that is accessible to all devices
- Reliable network with connections consistent with EOC full-staffing (plus 30%), with un-restricted data streaming

- Ability to project or display any computer visible to the entire EOC
- Ability to project or display local and national news outlets
- AV control system with logical user interface
- Position-specific user profile for each represented chair in the EOC
- Plotter or color printer with large-sized paper
- Spare computers

EOC DIGITAL COLLABORATION

Description: Real-time collaboration is a standard capability of an EOC and digital collaboration is a rapidlyevolving mode that (1) facilitates real-time communications from potentially anywhere and (2) the collection, transmission, storage and sharing of digital media

BASELINE CAPABILITIES:

- Group SMS
- Group e-mail
- Network file shares
- Consideration for outside agency EOC participants

- Cloud-based collaboration platforms (e.g. Google, Office 365, Teams, Slack, etc.)
- Role-based accounts (e-mail, storage, etc.)
- Multiple, simultaneous content authors/editors
- Remote collaboration

SECURITY, CYBERSECURITY AND PRIVACY

Description: EOCs often access, storage and share sensitive information and also host personnel from outside agencies and jurisdictions. EOC need to balance usability and adaptability in complex situations with protecting the integrity of systems and data.

BASELINE CAPABILITIES:

- Firewalls and anti-virus in place
- Basic password management
- Access/ID protocols in place and enforced
- Secure storage for EOC electronic files
- Handling protocols for sensitive/protected data
- Tagging sensitive content
- Sanitizing released photos

- Follow established best practices
- Policies/Enforcement
- Multi-factor authentication
- Virtual Private Networks (VPN)
- Encrypted Password management
- Account for human error