



Capstone 2014 Situational Awareness Symbology Brief

This document provides a high-level overview and comparative analysis of symbology commonly used for Incident Response and Management. Much of the symbology used by the emergency management community in the United States stems from the Homeland Security Working Group ANSI INCITIS 415-2006 standard. This standard divides symbols into four general categories: Incidents, Infrastructure, Sensors, and Command Features. The symbol sets reviewed in this document specifies mostly point geometry types, with some review of line or polygon geometries.

The following symbol sets are reviewed in this document:

Federal Geographic Data Committee Homeland Security Working Group (FGDC HSWG)	3
National Alliance for Public Safety GIS Incident Symbology Workgroup Symbols (NAPSG)	4
Multi-Agency Situational Awareness Systems Emergency Mapping Symbology (MASAS-EMS)	5
National Wildfire Coordinating Group (NWCG)	6
UN Office for the Coordination of Humanitarian Affairs (OCHA)	7

Symbol Set Capabilities Matrix

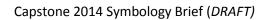
					Supported Categories					
Symbol Set	Format*	Best Used for	Supported Geometry	Scalable?	Incidents	Natural Events	Operations	Infra- structure		
FGDC HSWG	TTF	Paper Map	75	Y	•	•	•	•		
*ERS- HS	Esri	Paper Map	75	Y	•	•	•	•		
MASAS- EMS	PNG Esri	Web Map		Y	•	•	•	•		
NAPSG	PNG	Paper Map	V2	Υ	•		•	A		
NWCG	Esri	Paper Map		Υ	-	_	-			
ОСНА	PNG, EMF,	Web Map / Paper	97	Υ	•	•	•	•		

	SVG							
Symbol Key:	poin	it 🗸 line 🗘	polygon	• tho	rough = so	ome 🔺 r	none	

^{*} Format types: TTF: True Type Font, Esri: Esri Symbol format (.STYLE), PNG: PNG Image format

Schema Cross-walking

FGDC HSWG / ERS-HS	NAPSG	MASAS-EMS
Incidents	■ Incident / NIMS Incident Symbols	• Event/Incidents
Natural Events	Hazard / Specific Safety Hazards	• Event/Incidents
Operations	Incident / Command Features	Operations
Infrastructure	▲ n/a	 Infrastructure
Damage/Operational	▲ n/a	▲ n/a
• Close Match Partial N	Match A No Match	



Homeland Security Working Group (HSWG) – Emergency Response System (ERS) Homeland Security

Sample



About

- Developed by the FGDC Homeland Security Working Group, the latest version released in Sept. 2005 (v.2.2).
- Includes following categories:
 - Incidents
 - Natural Events
 - o Operations
 - o Infrastructure
 - o Damage/Operational
- Ported to an Esri Symbology Style file format by the Data Deja View, renamed 'ERS Homeland Security (Reference, pdf: http://l.usa.gov/13HqnJz)
- ERS Homeland Security comes pre-configured as a standard symbol set in Esri ArcGIS Desktop product

Analysis

While comprehensive, this symbol set is designed specifically for incidents at the community scale. At smaller scales (i.e., regional, state, national), it is difficult to distinguish symbols from each other, especially when more than one symbol type is displayed simultaneously. This symbology does not offer a 'halo' or high-contrast ring around the symbol, which makes it less optimal for web map applications.

Resource

http://www.fgdc.gov/HSWG/index.html

Link

Symbols are shown on an 11 x 17 inch map of the Annapolis Area:

Examples

http://1.usa.gov/16pTS5U

In addition, the PSU GeoVISTA Center offers a tool to preview selected symbols on a

dynamic map: http://symbolstore.org.
FGDC HSWG: True Type Font (TTF)

Format

ERS Homeland Security: Esri Style format (.STYLE)

Scalable?

Yes (12-72px)

National Alliance for Public Safety GIS (NAPSG) Incident Symbology Workgroup Symbols

Sample



















About

- This symbol set was a product of the Incident Symbology Workgroup, which was assembled by National Alliance for Public Safety GIS (NAPSG) Foundation to develop guidelines for symbology.
- The symbology is organized into the following categories:
 - Hazard Symbology:
 - Access Hazards
 - Specific Safety Hazards
 - o <u>Incident Symbols</u>
 - NIMS Incident symbology (clear rectangle)
 - Units (Clear oval)
 - Command Features (Clear circle)
 - o <u>Pre-Incident Sy</u>mbols
 - Access Features
 - Alarm & Detectors
 - HazMat
 - Fire Suppression Features
 - Building Features
 - Feature Shutoff

Analysis

This symbol set is influenced by the FGDC-HSWG symbology, as well as the National Incident Management System's (NIMS) Incident Command System (ICS) structure. There are very few infrastructure-related symbols; however it does contain many operational symbols that are not found in other symbology packages. Like the FGDC-HSWG, this isn't optimal for the purposes of web mapping applications because of the lack of halo effect around the symbol which is important if you want the symbol to stand out on different types of basemaps.

Resource Link

http://symbols.firemapping.com

Examples

See document for how to use NAPSG (or any other symbology based on image file types) using ArcGIS Online: http://bit.ly/1cGnhxc.

Format

PNG

Scalable?

No (icons are fixed at 120px; however, you can 'manually' scale them by overriding the dimensions in a third-party program).

Multi-Agency Situational Awareness Systems (MASAS): Emergency Mapping Symbology (EMS)

Sample



About

- Symbols were derived from the Homeland Security Working Group Emergency Symbology Reference, which served as the basis for the ANSI INCITS 415-2006 standard
- Includes following categories:
 - Incident
 - Infrastructure
 - Operations
- The EMS taxonomy is based heavily on these published sources:
 - MIL-STD 2525C and ANSI INCITS 415-2006, from which it was derived,
 - CAP-CP, the Canadian Profile of the Common Alerting Protocol, and
 - NIDM (the Canadian National Infrastructure Data Model), which was developed from the (US & Canada) Cross-Border Infrastructure Plan.
- This is largely an update/next-generation of the dated FGDC/HSWG symbology set, providing colorized symbols
- See presentation providing an overview of EMS here: http://emsymbology.org/SymbologyPresentation 20101210.pdf

Analysis

This symbol set is in use by over 400 agencies in Canada and the states of Maine and Oregon. Public Safety Canada has made the symbol set available to members of the National Information Sharing Consortium and it is readily deployable in numerous geospatial map environments (e.g. Google, Flex, ArcGIS Online, et al).

Resourc e Link http://emsymbology.org

Exampl es



http://www.masas-x.ca/en/

Format

PNG, Esri (.style format)

Scalable

Yes (32-400px)

?

National Wildfire Coordinating Group (NWCG)

Sample

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About

Relatively small symbol set (34 symbols), tailored to the needs of the wildfire response community. Based on NIMS ICS.

(C)

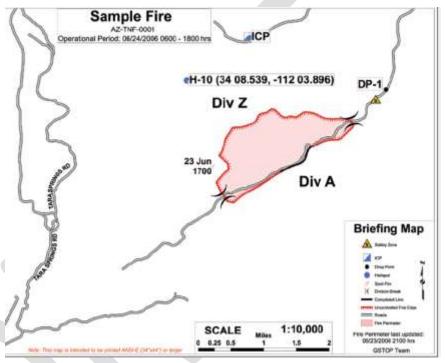
Analysis

Identified as a success story by the NAPSG Foundation (http://bit.ly/IBYUPO). One of the few symbology resources that include line and polygon symbology, in addition to iconography for point features.

Resource Link

Examples

http://gis.nwcg.gov/gstop_symbol.html



Format

Scalable?

Esri (.style format)

Yes (The icons are based on Esri's Character Marker Symbols, which can be scaled effectively from 5-70 px)

UN Office for the Coordination of Humanitarian Affairs (OCHA)

Sample



About

The OCHA symbol set contains approximately 500 icons focused on disaster and humanitarian releif. Originally released in 2008 and later updated in 2012.

The OCHA icon set are divided into the following categories:

activity food physical camp general product cluster infrastructure security crisis logistics socioeconomic damage other telecommunications disaster people

The icons are available in a variety of formats. They include versions with no borders, in SVG format (from the noun project website), as well as with borders (blue background with white foreground and white background with blue foreground) (from OCHA and Google).

Analysis

This is a comprehensive collection of two-tone icons, and share many similarities to the HSWG symbols. These icons do not include a halo border, and do not stand out on all basemaps. For example, the icons set with the blue background will stand out well on light-colored basemaps (like the example below); however do not have enough contrast on darker basemaps such as aerial imagery. As a workaround, the icons are available in with both white and blue background colors, therefore the user can apply the appropriate set based on the primary basemap used.

http://reliefweb.int/map/world/world-humanitarian-and-country-icons-2012\

Resource Link

- Main site for the OCHA Humanitarian Icons, include links to download icons in PNG and EMF formats.

http://thenounproject.com/collections/ocha-humanitarian-icons

- Hosts icon set in SVG format (scalable vector graphic format) in raw form, without background.

http://mw1.google.com/crisisresponse/icons/un-ocha/index.html

- Google hosted version of symbology, provide downloadable icons as well as hosted versions for use in web applications.

Examples



Format

PNG, EMF, SVG

Scalable?

Yes (20-100px)



Symbolizing Lines and Polygons

FEMA Damage Symbology (Polygons)

nage Classification ted Damage erate Damage nsive Damage	Generally superficial damage to solid structures (e.g., loss of tiles or roof shingles); some mobile homes and light structures are damaged or displaced. Solid structures sustain exterior damage (e.g., missing roofs or roof segments); some mobile homes and light structures are destroyed, many are damaged or displaced. Some solid structures are destroyed; most sustain exterior and interior damage (roofs missing, interior walls exposed); most mobile homes and light structures are destroyed.
erate Damage nsive Damage	mobile homes and light structures are damaged or displaced. Solid structures sustain exterior damage (e.g., missing roofs or roof segments); some mobile homes and light structures are destroyed, many are damaged or displaced. Some solid structures are destroyed; most sustain exterior and interior damage (roofs missing, interior walls exposed); most mobile homes and light structures are
nsive Damage	mobile homes and light structures are destroyed, many are damaged or displaced. Some solid structures are destroyed; most sustain exterior and interior damage (roofs missing, interior walls exposed); most mobile homes and light structures are
	(roofs missing, interior walls exposed); most mobile homes and light structures are
strophic Damage	Most solid and all light or mobile home structures destroyed.
nage Classificatio	ons
ed	Areas observed that have already burned.
ted Damage	Few structures are burned/destroyed.
nsive Damage	Some structures are completely burned/destroyed and sustained observable exterior damage.
strophic Damage	Most structures are completely burned/destroyed.
n	sive Damage

Note: The above classifications represent generalized expectations only; they do not exclude the possibility of variation within any classified area. Areas that are not observed nor have no discernable damage are left uncolored.

source: GeoCONOPS v.5

Virtual USA Pilot Symbology Guidelines (Polygons)

vUSA P	Not Essential Elements of Information (EEIs)				Secupation before	nation Requires	nents.			
CSAPAH	Erest	Operational Information Regalerments (i.e. KPIn or EEIs)	Stema Bed	Stone Yellov	States Green	States Talasma	Stores Seattire	Minimum Attributes	Berpunikle ESF	Authoritative Season
CANNE NO. EX.	Satisquees	Panage inty of coasts in agreement in g. process onto other, weather related coasts and, languages according, etc.)	Major dalays or classes:	Mary Strain Stra	Palatite :	Wester	Party	Popularine, topport in g. mile marter, laylong, adminst, interactions, layer (i.e., bridge, lauten perentary, print and interace of course (time Personal)	3-Transportation	007/812
CUBEC NUE 11.	Hyricana, Earthiusia	Communications nationals status - is g., salectomin, out toward, radio comms. GAO colours, Public balloty Accounting Access Plantic act.	Dragona compressor National Colonia	Divergency community above up, community failure for dead, including collusion	North Contracts	(Verest	heme	Communications retrieve riggs, name, owner, location, primary phone rountles (poors or poties of the county)	1-Communications	Teleco compania 8-speniora
исн.	Parties	Communications national status (in g., salescente, cell leaves, racio comme. CAD consume. Public Sales Announcing Promat PSAPal, etc.)	Same to renderstand marketed, or prospersion	National Property Services	No continue at the	(Manager)		Communications national lights	10mmenum	Tataur componia B. reponenterio
1297	National .	Water status bug many mage suppositions, water contamination, many association, and i	No constitution president	Barrella retira	Specialists	Districted in Contract of Cont	name.	Water authority name, Inspirer, PSC, Poliger-Seatora	SPARE NOTE INC.	Witer Authority
CUSAC NE A 11. PAINT	Bartingsana, Minima Marin	EOC status - Episcotomia status sifiscal, county, partiti and status Emergency Episcatomic Cantern deposited as a point and in action.	perel distribution (hard12 dest (\$100 to 100 to 10	(and it specificate) received	Distant	Itaritye	Name of SST, satisface, focation, or frame phone reprise, classes, many or publisher had see by seems or publisher had see by		SEC CHIMP

General resources:

<u>ANSI INCITS 415: Homeland Security Mapping Standard - Point Symbology for Emergency Management</u>, <u>2006 Edition</u>

Description from DHS: "Establishes a common set of symbols for use by mapmakers in support of emergency managers and first responders. It will allow users to rapidly interpret map data and to be able to disseminate consistent, usable information. This National Standard is applicable to all organizations that create maps or otherwise display features for the Emergency Management or First Responder communities. It is limited at this time to support portrayal of point features that relate to the emergency management and hazard mapping disciplines."

NAPSG Symbology Working Group Meeting – March 22-24, 2011, Version 1.3 Document #DHS2002C034 (PDF)

- Working group setup by DHS S&T R-Tech (tasked by FEMA National Integration Center) to develop/identify a best practice symbol set and consensus methodology to display ICS operations data.
- R-Tech partnered with NAPSG to leverage their network of practitioners and existing symbol set research.
- See table 3 containing a list of symbols proposed by NAPSG, and then the recommended symbology adopted by a consensus of the working group members.

DHS Symbology Standardization Support: Final Report on FEMA Symbology Standardization Process

Testing. November 2010 – January 2011

- Formal assessment of the DHS Homeland Security Working Group's ANSI INCITS 415-2006 point symbol standard conducted by the Penn State GeoVISTA Center.
- Methodology involved semi-structured interviews to survey map symbology for critical incidents used within DHS.
- Key findings:
 - Most respondents used their own symbology sets, indicating that the ANSI standard did not match their needs.
 - Suggest that best approach is for each mission to develop and share their own in-house standard rather than to generate a comprehensive standard for all of DHS.

Appendices

Comparison of HSWG/NAPSG/MASAS Symbology

MASAS EMS Tier 1 Full Symbol Set

MASAS EMS Tier 2 Full Symbol Set

NWCG Symbology

ESRI ESF Symbol Set

Category	Туре	HWSG / ERS	MASAS	ОСНА	NAPSG	Symbol Terms and Definitions (HSWG)	Symbol Classification (MASAS)
Incidents	Incidents Background Symbol	♦				Incidents Background Symbol (Background) - The background fill shape for the Incidents symbol.	
Incidents	Incidents Frame Symbol	\Diamond				Incidents Frame Symbol (Frame) - The frame shape for the Incidents symbol.	
Incidents	Civil Disturbance Incident	(1)	☆			Civil Disturbance Incident (Theme) - Human activities resulting in the disrupting of services or requiring varying levels of support, law enforcement or attention.	ems / incident / civil emergency
Incidents	Civil Demonstrations	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				Civil Demonstrations (Civil Disturbance) - A public display of group feelings toward a person or cause. (Source: Merriam-Webster Online Dictionary definition)	ems / incident / civil demonstrations
Incidents	Civil Displaced Population	***		1 -		Civil Displaced Population (Civil Disturbance) - Persons or groups of person who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, violations of human rights, or natural or human-made disasters. (Source: United Nations Guiding Principles on Internally Displaced Persons, 1998)	ems / incident / civil displacedPopulation
Incidents	Civil Rioting		***************************************			Civil Rioting (Civil Disturbance) - A public disturbance involving (1) an act or acts of violence by one or more persons part of an assemblage of three or more persons, which act or acts shall constitute a clear and present danger of, or shall result in, damage or injury to the property of any other person or to the person of any other individual or (2) a threat or threats of the commission of an act or acts of violence by one or more persons part of an assemblage of three or more persons having, individually or collectively, the ability of immediate execution of such threat or threats, where the performance of the threatened act or acts of violence would constitute a clear and present danger of, or would result in, damage or injury to the property of any other person or to the person of any other individual. (Source: 18 USC Section 2102)	ems / incident / civil riot
Incidents	Criminal Activity Incident	©	63	්රි		Criminal Activity Incident (Theme) - An unlawful pursuit or action in which an individual participates. (Source: www.dictionary.com; combined definitions of "criminal" and "activity")	ems / incident / crim
Incidents	Bomb Threat	(2)	***			Bomb Threat (Criminal Activity) - A warning of the of the possible presence of a bomb or expression of the intention to detonate a bomb.	
Incidents	Bomb	(*			Bomb (Criminal Activity) - An explosive device fused to detonate under specific conditions. (Source: International military definition)	

Incidents	Bomb Explosion		£		Bomb Explosion (Criminal Activity) - A violent outburst resulting from detonation of a chemical or nuclear explosive or from the loss of a high pressure vessel's integrity.	ems / incident / crin bombExplosion
Incidents	Looting		*	Ŗ	Looting (Criminal Activity) - Burglary committed within an affected area during an emergency. (Source: PeaceOfficers.com Glossary)	
Incidents	Poisoning	®		8	Poisoning (Criminal Activity) - Use of a poisonous substance to injure or kill (Source: Adapted from Merriam-Webster Online Dictionary definition)	
Incidents	Shooting	3	7		Shooting (Criminal Activity) - Use of a firearm to kill or injure or to damage property (Source: Condensed from Merriam-Webster Online Dictionary definition)	
Incidents	Fire Incident		%	(3)	Fire Incident (Theme) - The destructive act of something burning; caused either by electrical or technological malfunction, lightning, arson, human error or human negligence.	ems / incident / fire
Incidents	Hot Spot	®		8	Hot Spot (Fire Incident) - An area of intensified fire activity and increased heat or a particularly active part of a fire.	
Incidents	Non-Residential Fire				Non-Residential Fire (Fire Incident) - A fire that originates at or affects a non-residential or commercial facility, resulting in partial damage or total destruction of the structure and/or bodily injury, smoke inhalation or death.	
Incidents	Origin				Origin (Fire Incident) - Location of where the fire started. (Source: Forest Service Department of Agriculture http://www.fs.fed.us)	
Incidents	Residential Fire			A	Residential Fire (Fire Incident) - A fire affecting a home or housing complex, resulting in partial or total destruction of the structure and/or bodily injury, smoke inhalation or death.	
Incidents	School Fire				School Fire (Fire Incident) - A fire that originates at or affects an educational facility, resulting in partial or total destruction of the structure and/or bodily injury, smoke inhalation or death.	
Incidents	Smoke				Smoke (Fire Incident) - The visible products of combustion rising above the fire. (Source: www.firewise.org)	

Incidents	Special Needs Fire				Special Needs Fire (Fire Incident) - A fire that affects special treatment facilities, such as nursing homes or assisted living centers, resulting in partial or total destruction of the structure and/or bodily injury, smoke inhalation or death.	
Incidents	Wild Fire				Wild Fire (Fire Incident) - An uncontrolled fire in a wooded area. (Source: www.realdictionary.com)	
Incidents	Hazardous Material Incident	₩	*	HM	Hazardous Material Incident (Theme) - (Note: all of these proposed definitions are from the following source: Office of Hazardous Materials Safety, Hazmat Regulations and Interpretations)	ems / incident / hazardousMaterial
Incidents	Chemical Agents		<u>~</u>		Chemical Agents (Hazardous Incident) - A chemical substance, which is intended for use in military operations to kill, resulting in psychological disorientation, serious injury, incapacitation or death. (Source: NATO definition, found at http://arch.foxcitieskurgan.org/chem/terms.html)	ems / incident / hazardous Material / chemical Hazard
Incidents	Corrosive Material	((Corrosive Material (Hazardous Incident) - Uncontrolled or potentially dangerous presence of a liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time.	
Incidents	Hazardous When Wet	₩		(Hazardous When Wet (Hazardous Incident) - Uncontrolled or potentially dangerous presence of a material that, by contact with water, is liable to become spontaneously flammable or to give off flammable or toxic gas at a rate greater than 1 L per kilogram of the material, per hour.	
Incidents	Explosive	EW.	ENNS IX	- INI	Explosive (Hazardous Incident) - Uncontrolled or potentially dangerous presence of any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion.	ems / incident / hazardousMaterial / explosiveHazard
Incidents	Flammable Gas			*	Flammable Gas (Hazardous Incident) - Uncontrolled or potentially dangerous presence of any material which is a gas at 20°C (68°F) or less and 101.3 kPa (14.7 psia) of pressure (a material which has a boiling point of 20°C (68°F) or less at 101.3 kPa (14.7 psia)) which Is ignitable at 101.3 kPa (14.7 psia) when in a mixture of 13 percent or less by volume with air; or Has a flammable range at 101.3 kPa (14.7 psia) with air of at least 12 percent regardless of the lower limit.	
Incidents	Flammable Liquid	(4)		*	Flammable Liquid (Hazardous Incident) - Uncontrolled or potentially dangerous presence of a liquid having a flash point of not more than 60.5°C (141°F).	
Incidents	Flammable Solid				Flammable Solid (Hazardous Incident) - Uncontrolled or potentially dangerous presence of desensitized explosives that when dry are Explosives of Class 1 which are wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties.	

Incidents	Non-Flammable Gas	$\bigcirc \bigcirc$			\Diamond	Non-Flammable Gas (Hazardous Incident) - Uncontrolled or potentially dangerous presence of any material (or mixture) which Exerts in the packaging an absolute pressure of 280 kPa (40.6 psia) or greater at 20 °C (68 °F) and is not classified as a flammable gas.	
Incidents	Organic Peroxides					Organic Peroxides (Hazardous Incident) - No Definition.	
Incidents	Oxidizers	®			®	Oxidizers (Hazardous Incident) - Uncontrolled or potentially dangerous presence of a material that may, generally by yielding oxygen, cause or enhance the combustion of other materials.	
Incidents	Radioactive Material	*			③	Radioactive Material (Hazardous Incident) - Uncontrolled or potentially dangerous presence of any material having a specific activity greater than 70 Bq per gram.	ems / incident / hazardousMaterial / radiologicalHazard
Incidents	Spontaneously Combustible				(Spontaneously Combustible (Hazardous Incident) - Uncontrolled or potentially dangerous presence of a liquid or solid that, even in small quantities and without an external ignition source, can ignite within five (5) minutes after coming in contact with air or a material that, when in contact with air and without an energy supply, is liable to self-heat.	
Incidents	Toxic Gas		Q			Toxic Gas (Hazardous Incident) - Uncontrolled or potentially dangerous presence of a gas which affords a hazard to human health.	ems / incident / hazardousMaterial / poisonousGas
Incidents	Toxic and Infectious	®	8	1	®	Toxic and Infectious (Hazardous Incident) - Uncontrolled or potentially dangerous presence of a poisonous substance that is a specific product of the metabolic activities of a living organism and is usually very unstable and can easily be transferred between organisms.	ems / incident / hea / infectiousDisease
Incidents	Unexploded Ordnance	()		sky.		Unexploded Ordnance (Hazardous Incident) - Uncontrolled or potentially dangerous presence of an unexploded weapon or ammunition.	
Incidents	Air Incident	>		4	♦	Air Incident (Theme) - An event involving aircraft resulting in damage, bodily injury, death, or the disruption of transportation service.	ems / incident / aviation
Incidents	Air Accident			%		Air Accident (Air Incident) - A sudden, unexpected event involving aircraft resulting in fuselage damage, bodily injury, death and/or the disruption of transportation service; prompting emergency landing procedures or uncontrolled impact with the ground.	ems / incident / aviation / aircraftCra

Incidents	Air Hijacking		15°	•	(Air Hijacking (Air Incident) - The unexpected, unlawful and forceful seizure of control aboard an aircraft by an individual or group of individuals resulting in passenger and crew endangerment, injury or death, and/or the redirection of flight destination. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language to define "hijack")	ems / incident / aviation / aircraftHijacking
Incidents	Marine Incident	(4)	<u>~</u>			Marine Incident (Theme) - An event involving a boat or ship resulting in damage, bodily injury, death, or the disruption of transportation service.	ems / incident / mar
Incidents	Marine Accident	4	₩,	•	4	Marine Accident (Marine Incident) - A sudden, unexpected event involving a boat or ship resulting in vessel submerging, damage, bodily injury, death and/or the disruption of transportation service.	ems / incident / mar / nauticalAccident
Incidents	Marine Hijacking		€			Marine Hijacking (Marine Incident) - The unexpected, unlawful and forceful seizure of control aboard a boat or ship by an individual or group of individuals resulting in passenger and crew endangerment, injury or death, and/or the redirection of destination. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language to define "hijack")	ems / incident / mar / nauticalHijacking
Incidents	Rail Incident		222		(200	Rail Incident (Theme) - An event involving train resulting in damage, bodily injury, death, or the disruption of transportation service.	ems / incident / railv
Incidents	Rail Accident	***	S		***	Rail Accident (Rail Incident) - A sudden, unexpected event involving a wheeled or tracked vehicle resulting in derailment, damage, bodily injury, death and/or the disruption of transportation service.	ems / incident / railv / trainAccident
Incidents	Rail Hijacking		دق			Rail Hijacking (Rail Incident) - The unexpected, unlawful and forceful seizure of control aboard a wheeled or tracked vehicle by an individual or group of individuals resulting in passenger and crew endangerment, injury or death, and/or the redirection of destination. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language to define "hijack")	ems / incident / railv / trainHijacking
Incidents	Vehicle Incident		\$\infty\	(-		Vehicle Incident (Theme) - An event involving a wheeled or tracked vehicle resulting in damage, bodily injury, death, or the disruption of transportation service.	ems / incident / roadway
Incidents	Vehicle Accident		&			Vehicle Accident (Vehicle Incident) - A sudden, unexpected event involving a vehicle resulting in damage, bodily injury, death and/or the disruption of transportation service.	ems / incident / roadway / motorVehicleAccide
Incidents	Vehicle Hijacking		رچُ»	*=		Vehicle Hijacking (Vehicle Incident) - The unexpected, unlawful and forceful seizure of control aboard a vehicle by an individual or group of individuals resulting in passenger and crew endangerment, injury or death, and/or the redirection of destination. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language to define "hijack")	ems / incident / roadway / motorVehicleHijacki

Incidents	Road Closure		AA.	ROAD	Definition: A closure of a roadway due to natural or man-made causes.	ems / incident / roadway / roadwayClosure
Incidents	Bridge Closure			XXX (See	Definition: A closure of a bridge due to natural or man-made causes.	ems / incident / roadway / bridgeClosure
Incidents	Hazardous Road Conditions		<u>Q</u>		Definition: A natural or man-made event that causes roadways to become hazardous.	ems / incident / roadway / hazardousRoadCond ns
Natural Events	Natural Events Background Symbol	♦			Natural Events Background Symbol (Background) - The background fill shape for the Natural Events symbol.	
Natural Events	Natural Events Frame Symbol	\Diamond			Natural Events Frame Symbol (Frame) - The frame shape for the Natural Events symbol (unused).	
Natural Events	Geologic					
Natural Events	After Shock		(2)		After Shock (Geologic) - An earthquake that follows a larger earthquake and originates at or near the latter's focus. (Source: Dictionary of Geological Terms, 3rd Ed.)	ems / incident / geophysical
Natural Events	Avalanche				Avalanche (Geologic) - A large mass of snow, ice, soil, or rock, or mixtures of these materials, falling, sliding, or flowing very rapidly under the force of gravity. (Source: Dictionary of Geological Terms, 3rd Ed.)	ems / incident / geophysical / avalar
Natural Events	Earth Quake Epicenter			₩	Earth Quake Epicenter (Geologic) - The point on the earth's surface directly above the focus of an earthquake. (Source: Dictionary of Geological Terms, 3rd Ed.)	ems / incident / geophysical / earthquake
Natural Events	Landslide	\$	<u> </u>	Q	Landslide (Geologic) - A general term for a wide variety of processes and landforms involving the down slope movement under the force of gravity of masses of soil and rock material. (Source: Dictionary of Geological Terms, 3rd Ed.)	ems / incident / geophysical / lands

Natural Events	Subsidence	•		Subsidence (Geologic) - Sinking or downward settling of the earth's surface. (Source: Dictionary of Geological Terms, 3rd Ed.)	
Natural Events	Volcanic Eruption		<u>R</u> <u>E</u>	Volcanic Eruption (Geologic) - The ejection of volcanic materials (lava, pyroclasts, and volcanic gases) from a vent or fissure in the Earth's crust. (Source: Dictionary of Geological Terms, 3rd Ed.)	ems / incident / geophysical / volcanicEvent
Natural Events	Volcanic Threat	♦		Volcanic Threat (Geologic) - A vent or fissure in the Earth's crust where volcanic eruption is believed to be imminent. (Source: logical extension of "Volcanic Eruption")	
Natural Events	Hydro- Meteorological				
Natural Events	Drizzle	♦	O	Drizzle (Hydro-Meteorologic) - Some time called mist. Very small, numerous, and uniformly dispersed water droplets that appear to float while following air currents. Unlike fog droplets, drizzle fall to the ground.	
Natural Events	Drought			serious hydrologic imbalance across the affected area. Drought severity depends upon the degree of moisture deficiency,	ems / incident / meteorological / drought
Natural Events	Flood		<u> </u>	Flood (Hydro-Meteorologic) - A relatively high stream flow that overtops the stream banks in any part of its course, covering land that is not normally under water. (Source: Dictionary of Geological Terms, 3rd Ed.) A condition that occurs when water overflows the natural or artificial confines of a stream or other body of water, or accumulates by drainage over low-lying areas.	ems / incident / floo
Natural Events	Fog			Fog (Hydro-Meteorologic) - A visible aggregate of minute water droplets suspended in the atmosphere near the earth's surface. According to international definition fog reduces visibility to less than 5/8 mile. Fog differs from clouds only in that the base of the fog is at the earth's surface while clouds are above the surface.	ems / incident / meteorological / fog
Natural Events	Hail	\Diamond	\	Hail (Hydro-Meteorologic) - Precipitation in the form of circular or irregular-shaped lumps of ice. (Source: The National Weather Service glossary. http://www.crh.noaa.gov/lmk/glossary.htm)	ems / incident / meteorological / ha
Natural Events	Inversion			<i>Inversion (Hydro-Meteorologic)</i> - A departure from the standard decrease or increase with altitude of value of an atmosphere property. This term almost always means temperature inversion.	

Natural Events	Rain	♦		Rain (Hydro-Meteorologic) - Precipitation in the form of liquid water drops which have diameters greater than 0.5mm.	
Natural Events	Sand Dust Storm	♦ -{	\$ ************************************	Sand Dust Storm (Hydro-Meteorologic) - A strong wind carrying sand through the air, the diameter of most of the particles ranging from 0.08 to 1 mm. In contrast to a dust storm, the sand particles are mostly confined to the lowest teo feet, and rarely rise more than fifty feet above the ground.	ems / incident / meteorological / dustStorm
Natural Events	Snow	♦ 3	*	Snow (Hydro-Meteorologic) - Precipitation composed of white or translucent ice crystals, chiefly complex branched hexagonal form and often agglomerated into snowflakes.	ems / incident / meteorological / snowFall
Natural Events	Thunder Storm	†		Thunder Storm (Hydro-Meteorologic) - A thunderstorm is a consequence of atmospheric instability and constitutes and over turning of layers in order to achieve a more stable atmosphere. In general a local storm invariably produces lightning, thunder, usually strong gusts of winds, heavy rain and sometimes hail.	ems / incident / meteorological / thunderstorm
Natural Events	Tornado	♦	7 2	Tornado (Hydro-Meteorologic) - A violently rotating column, or funnel, of air in contact with the ground and extending from the base of a thunderstorm. (Source: Modified from the National Weather Service glossary. Link at: http://www.erh.noaa.gov/er/pit/branick2d.html#Glossary)	ems / incident / meteorological / tornado
Natural Events	Tropical Cyclone	♦		Tropical Cyclone (Hydro-Meteorologic) - The general term for a cyclone that originates over the tropical oceans.	ems / incident / meteorological / tropicalStorm
Natural Events	Tsunami	♦ (<u>C</u>	Tsunami (Hydro-Meteorologic) - A great sea wave produced by an earthquake or volcanic eruption, characterized by high speed of propagation, long wavelength, long period, and low observable amplitude on the open ocean. (Source: Dictionary of Geological Terms, 3rd Ed.) An ocean wave produced by a submarine earthquake, landslide, or volcanic eruption. These waves may reach enormous dimensions and have sufficient energy to travel across entire oceans. Tsunamis have no connection with tides as inferred by the common use of the term tidal wave.	ems / incident / floo tsunami
Natural Events	Infestation				
Natural Events	Bird Infestation	*		Bird Infestation (Infestation) - A harassing or troublesome invasion of birds. (Source: derived from the definition of "infestation" found in the FactMonster.com dictionary)	
Natural Events	Insect Infestation	A	*	Insect Infestation (Infestation) - A harassing or troublesome invasion of insects. (Source: derived from the definition of "infestation" found in the FactMonster.com dictionary)	

Natural Events	Microbial Infestation				Microbial Infestation (Infestation) - A harassing or troublesome invasion of a microbe. (Source: derived from the definition of "infestation" found in the FactMonster.com dictionary)	
Natural Events	Reptile Infestation				Reptile Infestation (Infestation) - A harassing or troublesome invasion of reptiles. (Source: derived from the definition of "infestation" found in the FactMonster.com dictionary)	
Natural Events	Rodent Infestation				Rodent Infestation (Infestation) - A harassing or troublesome invasion of rodents. (Source: derived from the definition of "infestation" found in the FactMonster.com dictionary)	ems / incident / hea / infestation
Operations	Operations Background Symbol				Operations Background Symbol (Background) - The background fill shape for the Operations symbol.	
Operations	Operations Frame Symbol	\bigcirc			Operations Frame Symbol (Frame) - The frame shape for the Operations symbol.	
Operations	Emergency Medical Operation	*			Emergency Medical Operation (Theme) - Urgent and unexpected medicinal treatment and/or transport during serious situations which require demands of immediate action. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition. Hybrid definition of "emergency" and "medical.")	ems / operations / emergencyMedical
Operations	EMT Station Locations		(1)	EMS	EMT Station Locations (Emergency Medical) - The locus of an emergency medical team.	ems / operations / emergencyMedical , EMTStationLocation
Operations	Ambulance				Ambulance (Emergency Medical) - A vehicle for taking sick or wounded people to and from a hospital.	ems / operations / emergencyMedical , ambulance
Operations	Medical Evacuation Helicopter Station	②		H	Medical Evacuation Helicopter Station (Emergency Medical) - The locus of an emergency helicopter landing pad, utilized to transport severely injured persons.	ems / operations / emergencyMedical medicalEvacuationI opterStation
Operations	Health Department Facility	①	H H		Health Department Facility (Emergency Medical) - The locus of a facility operated by a public institution which is dedicated to promotion of health and prevention of disease at the community, country, state, or national level. (Source: based on the APHA public health mission description).	

Operations	Hospital		P			Hospital (Emergency Medical) - The locus of an institution where the sick or injured are given medical or surgical care.	ems / operations / emergencyMedical , hospital
Operations	Hospital Ship	①				Hospital Ship (Emergency Medical) - The locus of a ship where the sick or injured are given medical or surgical care.	ems / operations / emergencyMedical / hospitalShip
Operations	Medical Facilities Out Patient	①	Φ.			Medical Facilities Out Patient (Emergency Medical) - The locus of a facility providing medical treatment to patients whose sickness or injury does not require hospitalization.	ems / operations / emergencyMedical / medicalFacilitiesOut ient
Operations	Morgue			ħΧ		Morgue (Emergency Medical) - The locus of a place where the bodies of persons found dead are kept until identified and claimed by relatives or released for burial. (Source: Merriam-Webster Online Dictionary definition)	ems / operations / emergencyMedical / morgue
Operations	Pharmacies	Ŗ	R			Pharmacies (Emergency Medical) - The locus of a place where medicines are compounded or dispensed. (Source: Merriam-Webster Online definition)	ems / operations / emergencyMedical / pharmacy
Operations	Triage				TR	Triage (Emergency Medical) - The locus of a place where sorting and allocation of treatment to patients (especially victims or war or disaster) is performed according to a system of priorities designed to maximize the number of survivors. (Source: Merriam-Webster Online Dictionary definition)	ems / operations / emergencyMedical / healthFacility
Operations	Emergency Operation					Emergency Operation (Theme) - Those actions taken during the emergency period to protect life and property, care for the people affected, and temporarily restore essential community services. (Source: modified San Diego State University Emergency Plan glossary; link at: http://bfa.sdsu.edu/emergencyplan/glossary.htm)	ems / operations / emergency
Operations	Emergency Collection Evacuation Point	(† † †)	1 €			Emergency Collection Evacuation Point (Emergency Operation) - A designated place where displaced persons or victims of war or disaster are assembled and/or evacuated from.	ems / operations / emergency / emergencyEvacuation oint
Operations	Emergency Incident Command Center				ICP	Emergency Incident Command Center (Emergency Operation) - The physical location from which an incident commander manages an incident. (Source: State of Virginia ICS web site)	ems / operations / emergency / emergencyOperation enter
Operations	Emergency Operations Center				ECC	Emergency Operations Center (Emergency Operation) - The physical location where an organization comes together during an emergency to coordinate response and recovery actions and resources and make management decisions. (Source: EMS web site)	ems / operations / emergency / emergencyOperation enter

Operations	Emergency Public Information Center		<u>^</u>	١	i	Emergency Public Information Center (Emergency Operation) - No Definition.	ems / operations / emergency / emergencyPublicInf ationCenter
Operations	Emergency Shelters					Emergency Shelters (Emergency Operation) - The locus of a designated emergency / relief shelter.	ems / operations / emergency / emergencyShelter
Operations	Emergency Staging Areas			A		Emergency Staging Areas (Emergency Operation) - A designated place where emergency management forces, equipment, and supplies are assembled prior to engagement in operations.	ems / operations / emergency / emergencyStagingA
Operations	Emergency Teams					Emergency Teams (Emergency Operation) - The locus of an emergency management team.	ems / operations / emergency / emergencyTeam
Operations	Emergency Water Distribution Center		Ŷ			Emergency Water Distribution Center (Emergency Operation) - A place where potable water is distributed to displaced persons or victims of war or disaster.	ems / operations / emergency / emergencyWaterDis utionCenter
Operations	Emergency Food Distribution Centers	(T)	1	3		Emergency Food Distribution Centers (Emergency Operation) - A place where food is distributed to displaced persons or victims of war or disaster.	ems / operations / emergency / emergencyFoodDist tionCenter
Operations	Fire Suppression Operation				FIRE	Fire Suppression Operation (Theme) - The extinguishing of a burning (and flaming) object by means of applying an agent, such as water. (Source: Modified from www.firewise.org glossary of terms)	ems / operations / emergencyFire / fireSuppresionOpero n
Operations	Fire Truck			7		Definition: A vehicle designed to assist in fighting fires by transporting firefighters to the scene and providing them with access to the fire, water or other equipment.	ems / operations / emergencyFire / fireTruck
Operations	Fire Hydrant					Fire Hydrant (Fire Suppression) - A discharge pipe with a valve and spout from which water may be drawn from a water main in sufficient volume and at sufficient pressure for firefighting purposes. (Source: Adapted from Merriam-Webster Online Dictionary definition of hydrant)	ems / operations / emergencyFire / fireHydrant
Operations	Other Water Supply Location			<u>C</u>		Other Water Supply Location (Fire Suppression) - Any source of water other than a fire hydrant that is sufficient for the purpose of fire fighting.	ems / operations / emergencyFire / otherWaterSupplyLo ion

Operations	Fire Station				Fire Station (Fire Suppression) - A facility housing fire-fighting equipment and/or personnel.	ems / operations / emergencyFire / fireStation
Operations	Law Enforcement Operation	*		LAW	Law Enforcement Operation (Theme) - Act of insuring obedience to the laws. (Source: www.dictionary.com, WordNet ® 1.6, © 1997 Princeton University.)	ems / operations / lawEnforcement
Operations	ATF	ATF			ATF (Law Enforcement) - A locus of U.S. Bureau of Alcohol, Tobacco, and Firearms facilities, equipment, or personnel.	
Operations	Border Patrol				Border Patrol (Law Enforcement) - A locus of U.S. Border Patrol facilities, equipment, or personnel.	
Operations	Customs Service				Customs Service (Law Enforcement) - A locus of U.S. Customs Service facilities, equipment, or personnel.	
Operations	DEA	DEA			DEA (Law Enforcement) - A locus of U.S. Drug Enforcement Administration facilities, equipment, or personnel.	
Operations	DOJ		472		DOJ (Law Enforcement) - A locus of U.S. Department of Justice facilities, equipment, or personnel.	
Operations	FBI	FBI			FBI (Law Enforcement) - A locus of Federal Bureau of Investigation facilities, equipment, or personnel.	
Operations	Police		1		Police (Law Enforcement) - A locus of Federal, State, or local police facilities, equipment, or personnel.	ems / operations / lawEnforcement / policeStation
Operations	Prison				Prison (Law Enforcement) - A facility for the confinement of persons convicted of serious crimes. (Source: Adapted from the Merriam-Webster Online Dictionary definition)	ems / operations / lawEnforcement / prison

Operations	Secret Service	W		Secret Service (Law Enforcement) - A locus of U.S. Secret Service facilities, equipment, or personnel.	
Operations	TSA	TSA		TSA (Law Enforcement) - A locus of U.S. Transportation Security Administration facilities, equipment, or personnel.	
Operations	US Coast Guard		•	US Coast Guard (Law Enforcement) - A locus of U.S. Coast Guard facilities, equipment, or personnel.	ems / operations / lawEnforcement / coastGuard
Operations	US Marshals Service			US Marshals Service (Law Enforcement) - A locus of U.S. Marshals Service facilities, equipment, or personnel.	
Operations	Military Operation		×	From MASAS: Coordinated military actions of a state in response to a developing situation. These actions are designed as a military plan to resolve the situation in the state's favour. Operations may be of combat or non-combat types, and are referred to by a code name for the purpose of security.	ems / operations / military
Operations	Sensor Operation	\odot	<u> </u>	Sensor Operation (Theme) - A device that receives and responds to a signal or stimulus. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition.)	ems / operations / sensor
Operations	Biological Sensor	®		Biological Sensor (Sensor Operation) - A device designed to respond to the presence of one or more biological substances and to transmit a resulting impulse. (Source: Adapted from the Merriam-Webster Online Dictionary definition of "sensor")	ems / operations / sensor / biologicalSensor
Operations	Chemical Sensor		<u></u>	Chemical Sensor (Sensor Operation) - A device designed to respond to the presence of one or more chemicals and to transmit a resulting impulse. (Source: Adapted from the Merriam-Webster Online Dictionary definition of "sensor")	ems / operations / sensor / chemicalSensor
Operations	Intrusion Sensor	②	2	Intrusion Sensor (Sensor Operation) - A device designed to respond to physical penetration of, or attempts to physically penetrate, a protected area or spatial volume and to transmit a resulting impulse. (Source: Adapted from the Merriam-Webster Online Dictionary definition of "sensor")	ems / operations / sensor / chemicalSensor
Operations	Nuclear Sensor	®		Nuclear Sensor (Sensor Operation) - A device designed to respond to one or more decay product(s) of one or more radioactive nuclides and to transmit a resulting impulse. (Source: Based on the Merriam-Webster Online Dictionary definition of "sensor" and inherent knowledge of the process, detection, and measurement of radioactivity)	ems / operations / sensor / nuclearSens
Operations	Radiological Sensor	3	<u> </u>	Radiological Sensor (Sensor Operation) - A device designed to respond to one or more decay product(s) of one or more radioactive nuclides and to transmit a resulting impulse. (Source: Based on the Merriam-Webster Online Dictionary definition of "sensor" and inherent knowledge of the process, detection, and measurement of radioactivity)	ems / operations / sensor / radiologicalSensor

Infrastructure	Infrastructure Background Symbol				Infrastructure Background Symbol (Background) - The background fill shape for the Infrastructure symbol.	
Infrastructure	Infrastructure Frame Symbol				Infrastructure Frame Symbol (Frame) - The frame shape for the Infrastructure symbol.	
Infrastructure	Agriculture and Food Infrastructure	പ്പീ	Â	#	Agriculture and Food Infrastructure (Theme) - Production and retail services of foodstuffs.	ems / infrastructure food
Infrastructure	Agricultural Laboratories	↑ å			Agricultural Laboratories (Agriculture and Food) - Facilities used for scientific research in farming.	
Infrastructure	Animal Feedlots				Animal Feedlots (Agriculture and Food) - Area designated for feeding livestock.	
Infrastructure	Commercial Food Distribution Center				Commercial Food Distribution Center (Agriculture and Food) - Facilities used for the disbursement of marketable foodstuffs.	
Infrastructure	Farms Ranches	δ+			Farms Ranches (Agriculture and Food) - A piece of land on which crops or animals are raised.	
Infrastructure	Food Production Center			€	Food Production Center (Agriculture and Food) - The locus where foodstuffs are produced.	
Infrastructure	Food Retail				Food Retail (Agriculture and Food) - Facility where foodstuffs are sold for a profit.	
Infrastructure	Grain Storage	¥		<u> </u>	Grain Storage (Agriculture and Food) - Facility used for the housing of cereal seeds such as corn, wheat, barley, etc.	
Infrastructure	Banking Finance				Banking Finance and Insurance Infrastructure (Theme) - The management of money and other assets and their protection.	
	and Insurance	\$		Š	(Source: modified www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition.)	
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	Infrastructure		
Infrastructure	ATMs		ATMs (Banking Finance and Insurance) - An unattended machine commonly located at a bank"s exterior which dispenses money when a personal coded card is inserted. (Source: Modified from www.hyperdictionary.com.)
Infrastructure	Banks	\$	Banks (Banking Finance and Insurance) - A business establishment in which money is kept for saving for commercial purposes or is invested, supplied for loans, or exchanged. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition.)
Infrastructure	Bullion Storage	<i>≥≥6.</i>	Bullion Storage (Banking Finance and Insurance) - A facility used to deposit and warehouse gold or silver bars or ingots. (Source: www.hyperdictionary.com, Hybrid definition of "bullion" and "storage.")
Infrastructure	Federal Reserve Banks		Federal Reserve Banks (Banking Finance and Insurance) - One of twelve regional banks that monitor and act as depositories for banks in their region. (Source: www.hyperdictionary.com.)
Infrastructure	Financial Exchanges	\$^	Financial Exchanges (Banking Finance and Insurance) - A marketplace in which shares, options and futures on stocks, bonds, commodities, and indexes are traded. (Source: Yahoo! Finance glossary: http://biz.yahoo.com/f/g/ee.html.)
Infrastructure	Financial Services Other	* \$	Financial Services Other (Banking Finance and Insurance) - A business establishment for the provision of financial or monetary related products and services other than a bank. Locations which deal with money management business.
Infrastructure	Commercial Infrastructure	1	Commercial Infrastructure (Theme) - The locus of where a business enterprise is undertaken. (Source: www.hyperdictionary.com.)
Infrastructure	Chemical Plant		Chemical Plant (Commercial Infrastructure) - An industrial site where chemical substances and-or compounds are produced. (Source: Modified from www.hyperdictionary.com.)
Infrastructure	Firearm Manufacturers		Firearm Manufacturers (Commercial Infrastructure) - The location where hand weapons of explosive force when shot are mass produced. (Source: Webster"s New World Dictionary; hybrid definition of "firearm" and "manufacture".)
Infrastructure	Firearm Retailers	<u> </u>	Firearm Retailers (Commercial Infrastructure) - The location where hand weapons of explosive force when shot are sold. (Source: Webster"s New World Dictionary; hybrid definition of "firearm" and "retail".)

Infrastructure	Hazardous Material Production		◆	Hazardous Material Production (Commercial Infrastructure) - The locus of where hazardous chemicals and-or substances are produced and stored under regulated conditions.	
Infrastructure	Hazardous Material Storage	<u></u>		Hazardous Material Storage (Commercial Infrastructure) - A storing location for a substance or combination of substances that because of quantity, concentration, physical, chemical, radiological, explosive, or infectious characteristics poses a potential danger to humans and/or the environment. (Source: San Diego State University Emergency Plan glossary; link at: http://bfa.sdsu.edu/emergencyplan/glossary.htm.)	
Infrastructure	Industrial Site			Industrial Site (Commercial Infrastructure) - The locus of an industrial facility or facilities used for the commercial production and selling of manufactured goods. (Source: www.dictionary.com; The American Heritage® Dictionary of the English Language, Fourth Edition.)	ems / infrastructure manufacturing
Infrastructure	Landfill	<u> </u>		Landfill (Commercial Infrastructure) - An area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile. (Source: The Federal Aviation Administration glossary. Link at: http://wildlife-mitigation.tc.faa.gov/ (public_html/manuals/glossary.pdf)).	
Infrastructure	Pharmaceutical Manufacturer	™		Pharmaceutical Manufacturer (Commercial Infrastructure) - The location where medicinal drugs are mass produced. (Source: Webster's New World Dictionary; hybrid definition of "pharmaceutical" and "manufacture".)	
Infrastructure	Superfund Sites NPL	<u></u>	9	Superfund Sites NPL (Commercial Infrastructure) - A location in the United States that has been contaminated by hazardous waste and identified by the Environmental Protection Agency as a candidate for clean-up because it poses a risk to human health and-or the environment. (Source: Environmental Protection Agency. Link at: http://www.epa.gov.)	
Infrastructure	Toxic Release Inventory		(3)	Toxic Release Inventory (Commercial Infrastructure) - The location according to a publicly available database of chemical and other toxic waste releases. (Source: Environmental Protection Agency. Link at: http://www.epa.gov.)	
Infrastructure	Educational Facilities Infrastructure			Educational Facilities Infrastructure (Theme) - A building or collection of buildings or places that provides knowledge. (Source: www.hyperdictionary.com, Hybrid definition of "educational" and "facility.")	
Infrastructure	College University	•		College University (Educational Facilities) - An institution of higher learning offering a course of studies leading to a Bachelor's or Master's or Doctoral degree. (Source: Adapted from Merriam-Webster Online Dictionary definitions of "college" and "university")	
Infrastructure	Schools			Schools (Educational Facilities) - A facility for the primary and secondary education of children. (Source: Adapted from Merriam-Webster Online Dictionary definition)	

Infrastructure	Energy Facilities Infrastructure				Energy Facilities Infrastructure (Theme) - A building or collection of buildings and/or places that generates and provides electrical power.
Infrastructure	Generation Stations			*	Generation Stations (Energy Facilities) - A facility equipped with special equipment used for the production of heat or electricity. (Source: www.hyperdictionary.com, Hybrid definition of "generation" and "station.")
Infrastructure	Natural Gas Facilities				Natural Gas Facilities (Energy Facilities) - A locus equipped with special equipment used to generate nuclear gas power.
Infrastructure	Nuclear Facilities	*	**		Nuclear Facilities (Energy Facilities) - A locus equipped with special equipment used to generate nuclear power.
Infrastructure	Petroleum Facilities	4.	1	□ ť	Petroleum Facilities (Energy Facilities) - A building or place that provides and distributes petroleum gas.
Infrastructure	Propane Facilities				Propane Facilities (Energy Facilities) - A building or place that provides and distributes propane gas.
Infrastructure	Government Site Infrastructure	Î			Government Site Infrastructure (Theme) - The locus of where executive, legislative and-or judicial activities take place in the service of the government.
Infrastructure	Military Infrastructure		- X		Military Infrastructure (Theme) - Refers collectively to the four major branches of the United States" armed forces as associated with, or performed by armed services as contrasted with civilians. (Source: modified sources.)
Infrastructure	Military Armory	₩	×		Military Armory (Military) - A military structure where arms and ammunition and other military equipment are manufactured and stored, and also where training is given in the use of arms. (Source: www.hyperdictionary.com.)
Infrastructure	Military Base	X	T N	В	Military Base (Military) - The locus of where military personnel, weapons and supplied are located, and also where attacks and other operations are coordinated and launched. (Source: "Scholastic News" military glossary.)
Infrastructure	Postal Service Infrastructure				Postal Service Infrastructure (Theme) - The system whereby letters, messages and other parcels are transmitted and delivered via the post office. (Source: Modified from www.hyperdictionary.com.)
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Infrastructure	Postal Distribution Center				Postal Distribution Center (Postal) - A U.S. Postal Service (USPS) facility where mail is sorted and routed. (Source: USPS web-page description of function)
Infrastructure	Post Office				Post Office (Postal) - A U.S. Postal Service (USPS) facility that directly delivers postal services to the public.
Infrastructure	Public Venues Infrastructure	<u>**</u>	*		Public Venues Infrastructure (Theme) - An unrestricted place or places and events for a large gathering of people. (Source: Modified from www.dictionary.com.)
Infrastructure	Enclosed Facility				Enclosed Facility (Public Venues) - A roofed facility with walls.
Infrastructure	Open Facility				Open Facility (Public Venues) - An open air facility with or without walls, e.g., stadium, parking lot, etc.
Infrastructure	Recreational Area	7			Recreational Area (Public Venues) - A place dedicated to the refreshment of strength and spirits after work. (Source: Merriam-Webster Online Dictionary)
Infrastructure	Religious Institution		00	İ	Religious Institution (Public Venues) - Any place of worship where religious services are held or prayers said by congregation loyal to a belief.
Infrastructure	Special Needs Infrastructure	Ġ.		<u>&</u>	Special Needs Infrastructure (Theme) - Of or relating to people who have specific needs, as those associated with a disability. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition.)
Infrastructure	Adult Day Care	κ'n			Adult Day Care (Special Needs) - The locus of a non-residential facility that provides supervision and assisted living services to adults, typically during the daylight hours.
Infrastructure	Child Day Care				Child Day Care (Special Needs) - A service involving care for other people's children. (Source: www.dictionary.com, WordNet ® 1.6, © 1997 Princeton University.)
Infrastructure	Elder Care	7		N	Elder Care (Special Needs) - The locus of a nursing home or a residential assisted living facility in which full-time care is provided for chronically ill, disabled, and elderly.

Infrastructure	Telecommunicati ons Infrastructure	(A)		Â	Telecommunications Infrastructure (Theme) - The electronic systems used in transmitting messages, as by telegraph, cable, telephone, radio, television or computer. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition.)	
Infrastructure	Telecommunicati ons Facility		B		Telecommunications Facility (Telecommunications) - Any facility housing telecommunications equipment, studios, control rooms, or personnel.	
Infrastructure	Telecommunicati ons Tower	A		Â	Telecommunications Tower (Telecommunications) - A structure typically higher than its diameter and high relative to its surroundings to which telecommunications antennae are affixed. (Source: Adapted from Merriam-Webster Online Dictionary)	
Infrastructure	Transportation Infrastructure	3			Transportation Infrastructure (Theme) - Infrastructure, means of transport, and equipment necessary for the movement of passengers and-or goods. (Source: http://dict.die.net.)	ems / infrastructure transportation
Infrastructure	Air Traffic Control Facility	7			Air Traffic Control Facility (Transportation) - A facility operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic. (Source: The Federal Aviation Administration glossary; link at: http://www.fly.faa.gov/Products/Glossary_of_Terms/ glossary_of_terms.html.)	
Infrastructure	Airport	>	£	4	Airport (Transportation) - An area of land or other hard surface, excluding water, that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any. (Source: The Federal Aviation Administration glossary; link at: http://wildlife-mitigation.tc.faa.gov/public_html/manuals/glossary.pdf.)	
Infrastructure	Bridge	×	\approx		Bridge (Transportation) - A structure built over a gap to connect and maintain transportation flow between either sides of the gap. (Source: Modified from Webster"s New World Dictionary.)	
Infrastructure	Bus Station				Bus Station (Transportation) - A terminal that serves bus passengers. (Source: www.hyperdictionary.com.)	
Infrastructure	Ferry Terminal				Ferry Terminal (Transportation) - The location of a vehicle-carrying and commuter boat line terminus. (Source: Modified from www.dictionary.com.)	
Infrastructure	Helicopter Landing Site	•	2		Helicopter Landing Site (Transportation) - A site within a landing zone that contains one or more points for helicopters to land. (Source: Dennis J. Reimer Training and Doctrine Digital Library, military terms glossary. Link at: http://www.adtdl.army.mil/cgi-bin/atdl.dll/fm/3-21.38/gloss.htm.)	
Infrastructure	Lock				Lock (Transportation) - An enclosed part of a canal or river equipped with gates for raising or lowering the level of water so that boats and other vessels may pass. (Source: Modified from Webster"s New World Dictionary.)	

Infrastructure	Maintenance Facility	*	Æ		Maintenance Facility (Transportation) - A location where vehicles, machines or any other mechanical devices are serviced for inspection or repair. (Source: Modified from www.hyperdictionary.com.)
Infrastructure	Port	_\$			Port (Transportation) - A location on a waterway with facilities for loading and unloading ships and other vessels. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition.)
Infrastructure	Rail Station	21			Rail Station (Transportation) - A depot where tracked transport vehicles or trains load and-or unload passengers or goods. (Source: www.hyperdictionary.com, modified definition from "depot.")
Infrastructure	Rest Stop	ŤŤ	ii	† †	Rest Stop (Transportation) - A roadside facility at which motorists may purchase refreshments, use restrooms and-or acquire area information.
Infrastructure	Ship Anchorage	Ţ			Ship Anchorage (Transportation) - A location suitable for securely anchoring ships and other vessels. (Source: www.dictionary.com, Webster's Revised Unabridged Dictionary, © 1996, 1998 MICRA, Inc.)
Infrastructure	Toll Facility	4			Toll Facility (Transportation) - A gate or booth at which money is collected before and-or after motorists enter or exit a toll road (turnpike). (Source: Modified from Webster"s New World Dictionary.)
Infrastructure	Traffic Control Point	4			Traffic Control Point (Transportation) - The location of absolute signals controlled by an operator to regulate and maintain transportation flow.
Infrastructure	Traffic Inspection Facility	⇔ 'å			Traffic Inspection Facility (Transportation) - Permanent facility equipped with scales where motor (shipping) vehicles transporting goods on public highways are required to stop and obtain gross vehicle and/or axle weights. (Source: Nextlinx, Link: http://www.nextlinx.com/tools_gloss10U.html. Definition of "weigh station".)
Infrastructure	Tunnel				Tunnel (Transportation) - An underground passageway used to connect and maintain transportation flow between a physical or human-built obstruction. (Source: Modified from Webster"s New World Dictionary.)
Infrastructure	Water Supply Infrastructure		5		Water Supply Infrastructure (Theme) - The storage, disinfection, filtration and provision of drinking water to the consumer/community by means of pipelines, pumps, water towers, wells and other appurtenances. (Source: County of Maui (Hawaii) Water Supply glossary. Link at: http://mauiwater.org/glossary.html. Hybrid definition of "water system" and "treated water.")

Infrastructure	Critical Valves	- ₹-1		Critical Valves (Water Supply) - A valve which regulates the speed, flow or pressure of a fluid. (Source: "Valve World" glossary, definition of "control valve." Link at: http://www.valve-world.net/glossary/index.asp.)
Infrastructure	Dam			Dam (Water Supply) - A barrier constructed across a waterway to control the flow or raise the level of water. (Source: www.dictionary.com, The American Heritage® Dictionary of the English Language, Fourth Edition.)
Infrastructure	Discharge Outfall	.D.		Discharge Outfall (Water Supply) - The volume of effluent that is released into receiving waters at a given location and within a given period of time. (Source: Hybrid definition from the Ohio Environmental Protection Agency glossary (term "outfall") and from the United States Geologic Survey (term "discharge"). Modified. Links at: http://www.epa.state.oh.us (/ddagw/Documents/swapdocglo.pdf) and http://ga.water.usgs.gov/edu/dictionary.html.)
Infrastructure	Ground Well	<u> 1</u>	•	Ground Well (Water Supply) - An artificial excavation drilled into the ground for the purposes of withdrawing water from the underground aquifers. Source: Modified from the USGS Water Science glossary. Link at: http://ga.water.usgs.gov/edu/dictionary.html.)
Infrastructure	Pumping Station	A GA		Pumping Station (Water Supply) - Facility that lifts water up and over hills. (Source: Ridenbaugh Press. Link at: http://www.ridenbaugh.com.)
Infrastructure	Reservoir			Reservoir (Water Supply) - An off-steam water storage facility that is filled with water pumped from a river or stream. (Source: Ohio Environmental Protection Agency glossary (term "upground reservoir"). Link at: http://www.epa.state.oh.us (/ddagw/Documents/swapdocglo.pdf))
Infrastructure	Storage Tower		R	Storage Tower (Water Supply) - A large (usually metallic) container for holding gases or liquids. (Source: www.hyperdictionary.com.)
Infrastructure	Surface Water Intake		6	Surface Water Intake (Water Supply) - A pipe through which wastewater is transferred directly to another site. (Source: USGS Water Resources of New Hampshire and Vermont glossary. Hybrid definition of "intake pipe" and "surface water return flow." Link at: http://nh.water.usgs.gov/Publications/OFR01-328/ofr01-328_glossary.pdf.)
Infrastructure	Water Treatment Facility		SOA AAA	Water Treatment Facility (Water Supply) - A place designed to receive the wastewater from domestic sources and to remove materials that damage water quality and threaten public health and safety when discharged into receiving streams or bodies of water. (Source: USGS Water Science glossary. Link at: http://ga.water.usgs.gov/edu/dictionary.html.)
Damage/ Operational	Incident	\Diamond		Incident (Damage/Operational) - Not Applicable

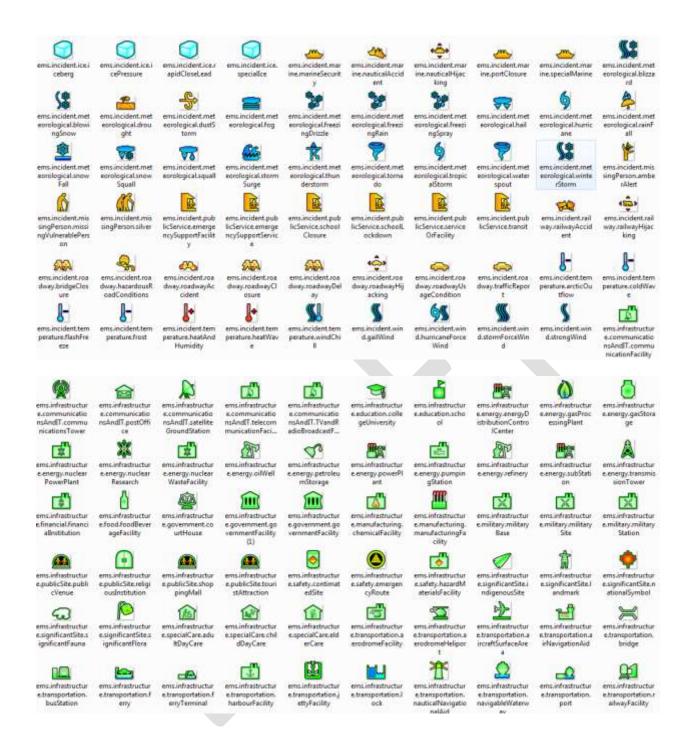
Damage/ Operational	Natural Event	\Diamond	Natural Event (Damage/Operational) - Not Applicable
Damage/ Operational	Operation		Operation (Damage/Operational) - Fully operational/open.
Damage/ Operational	Operation		Operation (Damage/Operational) - Operational, but filled to capacity or otherwise closed.
Damage/ Operational	Operation		Operation (Damage/Operational) - Operational, but partially damaged or partially incapacitated.
Damage/ Operational	Operation	0	Operation (Damage/Operational) - Destroyed or Totally incapacitated.
Damage/ Operational	Infrastructure		Infrastructure (Damage/Operational) - Fully operational/open.
Damage/ Operational	Infrastructure		Infrastructure (Damage/Operational) - Operational, but filled to capacity or otherwise closed.
Damage/ Operational	Infrastructure		Infrastructure (Damage/Operational) - Operational, but partially damaged or partially incapacitated.
Damage/ Operational	Infrastructure		Infrastructure (Damage/Operational) - Destroyed or Totally incapacitated.

MASAS EMS Tier 1 (Full Symbol Set)



MASAS EMS Tier 2 (Full Symbol Set)

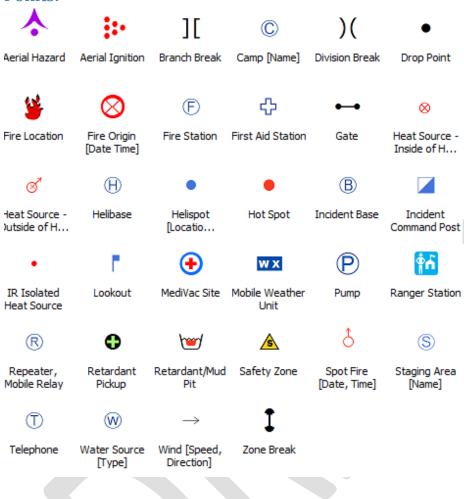




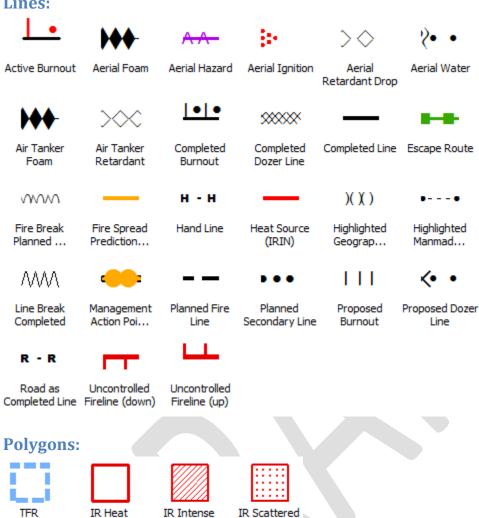


NWCG Symbology (Full Symbol Set)

Points:



Lines:



Perimeter

Heat

Heat

Esri ESF symbols

Source: Esri Public Safety COP application (https://github.com/Esri/public-safety-cop)

ESF #1 - TRANSPORTATION

- Aviation/airspace management and control
- Transportation safety
- Restoration/recovery of transportation infrastructure
- Movement restrictions
- Damage and impact assessment

ESF #2 – COMMUNICATIONS

- Coordination with telecommunications and information technology industries
- Restoration and repair of telecommunications infrastructure
- Protection, restoration, and sustainment of national cyber and information technology resources
- Oversight of communications within the federal incident management and response structures

ESF #3 – Public Works and Engineering

- Infrastructure protection and emergency repair
- Infrastructure restoration
- Engineering services and construction management
- Emergency contracting support for lifesaving and life-sustaining services

ESF #4 - FIREFIGHTING

- Coordination of federal firefighting activities
- Support to wild land, rural, and urban firefighting operations

ESF #5 - EMERGENCY MANAGEMENT

- Coordination of incident management and response efforts
- Issuance of mission assignments
- Resource and human capital
- Incident action planning
- · Financial management

ESF #6 – Mass Care, Emergency Assistance, Housing, and Human Services

- Mass care
- Emergency assistance
- Disaster housing
- Human services
- Sheltering













ESF #7 – LOGISTICS MANAGEMENT AND RESOURCE SUPPORT

- Comprehensive, national incident logistics planning, management, and sustainment capability
- Resource support (facility space, office equipment and supplies, contracting services, etc.)



ESF #8 – Public Health and Medical Services

- Public health
- Medical
- Mental health services
- Mass fatality management



ESF #9 – SEARCH AND RESCUE (SAR)

- Lifesaving assistance
- Search and rescue operations



ESF #10 – OIL AND HAZARDOUS MATERIALS RESPONSE

- Oil and hazardous materials (chemical, biological, radiological, etc.) response
- Environmental short- and long-term cleanup



ESF #11 – AGRICULTURE AND NATURAL RESOURCES

- Nutrition assistance
- Animal and plant disease and pest response
- Food safety and security
- Natural and cultural resources and historic properties protection and restoration
- Safety and well-being of household pets



ESF #12 - ENERGY

- Energy infrastructure assessment, repair, and restoration
- Energy industry utilities coordination
- Energy forecast



ESF #13 - Public Safety and Security

- Facility and resource security
- Security planning and technical resource assistance
- Public safety and security support
- Support to access, traffic, and crowd control



ESF #14 - LONG-TERM COMMUNITY RECOVERY Social and economic community impact assessment Long-term community recovery assistance to states, local governments, and the private sector Analysis and review of mitigation program implementation ESF #15 – EXTERNAL AFFAIRS • Emergency public information and protective action guidance Media and community relations Congressional and international affairs • Tribal and insular affairs OTHER COMMAND Logistics **OPERATIONS PLANNING** PUBLIC INFORMATION

