Emergency and Hazards Mapping Symbology

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Background:

As humans occupy more space on Earth, the burden of mortality and property losses from natural and technological hazards has also increased. Maps for hazard management, especially emergency maps, are being produced and published by various federal, state and local agencies, institutions and the private sector. For less costly and more effective response to extreme events, our use of information before, during and after disasters must be enhanced. Hazard Management Hazard maps provide a unique organization of vital information for hazard identification, risk estimation and allocation of resources. They are a major support for emergency managers at all stages of a disaster. Within the Federal Emergency Management Agency (FEMA), responsible for response to disasters, a Rapid Assessment Work Group (FEMA 1999) has developed comprehensive event-specific Information Collection Plans. These plans provide detailed information about each type of emergency event, for example, hurricanes. Maps for pre-event planning and post-event mitigation and recovery efforts are needed essentials in these plans. However, emergency maps go beyond planning maps to include crisis maps which are peculiar because they are often generated during an event and need to be interpreted quickly as well. Investigation of the use of maps produced by geographic information systems (GIS) after Hurricane Andrew in 1992 and after Hurricane Fran in 1996 revealed the lack of guidelines and standards for production of hazard maps as a crucial shortfall when it came to data sharing. This problem was illuminated again in the wake of the 9/11/2001event in New York when many different agencies made crisis maps of changing conditions and in the process created their own symbology to convey critical information to emergency managers. The exchange and quick interpretation of vital information was made difficult by the lack of a common symbology. The need for research into symbology for emergency maps was highlighted.

Missing Ingredient for Emergency Mapping

When it comes to spatial information that is needed during a disaster, there is currently no consistent national set of map symbols available for the development of hazard and emergency management maps. In order to facilitate the exchange of information and data, to promote universal understanding of hazardous and vulnerable locations and to adequately address communication of mission critical information across agencies, jurisdictions, and all levels of public and private sectors, a set of standard cartographic symbols needs to be developed and endorsed by the Federal Geographic Data Committee (FGDC). The development of standards for hazard mapping will strengthen coordination and communication between planners and will enhance the ability of emergency managers to better understand information at a glance during crucial decision making moments.

What is a Symbol?

Webster defines symbols as *a) something used for or regarded as representing something else: a material object representing something, often something immaterial; emblem, token, or sign. b) as a letter, figure, or other character or mark or a combination of letters or the like used to represent something*". In contrast, the Oxford Dictionary defines symbols as *an object used to represent something abstract, a mark, letter, etc. standing for a quality, process, etc., as in music or chemistry. Synonyms: representative, token, figure, sign. (See Appendix I-Definitions)*

In mapping there are generally two classes of symbols used: replicative or abstract.

      Replicative symbols are those that are designed to replicate or look like the feature they represent. These symbols do not need to have any direct connection to what they identify, but they may be representational,

such as an airplane to designate airports or trees to symbolize forest. In hazard mapping of a severe weather area, we may see the outline of a tornado that is replicative of the cloud pattern that is seen when a tornado has formed.

Abstract symbols generally take the form of a geometric shape (Dent, 1999). This type of symbol has no relationship to the form of the object it symbolizes. When we consider the dictionary definitions for symbols, a hospital can be drawn on a map as a letter "H", as a figure representing the building, or perhaps as a circle or box with or without an H inside.

Project Scope:

The purpose of this project was to conduct preliminary research in order to identify and catalog existing emergency mapping symbols and graphics that are currently being used throughout various agencies and institutions. In addition, the creation and the design of new symbols and graphics that incorporate existing ideas and conventions are being prepared for review and proposed standardization by the Federal Geographic Data Committee (FGDC) Standards Working Group. The project was limited to examination of the point or pictographic symbols for hazard management mapping. This does not cover techniques for depicting certain conditions over a given geographic area on a map.

- It is essential that this line of research eventually be expanded for line and area symbols also to be studied for their standardization.

Methodology:

The *first step* in this study required the identification of existing emergency and hazard mapping symbols. Two graduate students spent six months searching the web and library for existing symbols by contacting people and agencies that used them. Federal, state and local agencies, including emergency managers, and software companies were contacted. As a follow-up, inputs were solicited from a large number of agencies and institutions by email and in person because
searching the web revealed that there was very little information available concerning hazard or emergency symbology.

The *second step* included the development of a matrix to a) identify the hazards and emergency information for which symbology was used, b) to identify the agencies that currently use hazard and emergency symbology, and c) to identify hazard mapping symbols embedded in commercial software. This information was compared to identify how many repetitive symbols are currently in use.

The *third step* is a proposed set of redesigned symbols that the FEMA GIS Working Group, the Federal Geographic Data Committee (FGDC) Standards Working Group and the FGDC Coordination Group can review.

Web search and Email Contacts:
(See Appendix II)

Conclusions from the Search for Symbols

- Hazard and emergency symbology information is not readily available. It required considerable amounts of searching since information was found hidden on web pages and maps.

- The traditional thrust of focusing on one specific disaster remained deeply ingrained in the information found and received. Separate information on earthquakes, hurricanes or tornadoes was readily available, but the symbols depicting these events were found in all kinds of styles and formats.

- In terms of electronic map production, the majority of organizations use ESRI software, followed by CAMEO and MapInfo. Others used Micro Station and other software not as well known. Some programmed their own software.

- Because of the technological constraints that resulted from scale reduction and electronic transmissions, most symbols had to be redrawn making it difficult for managers to use these symbols directly.

- On most emergency maps, the symbols were applied at the time of need, applied during an event for example.

- Most symbols used were already available in GIS or graphic software that was used by the agencies or institution.

- Some agencies created lists of symbols that were repetitively used in their office. Others redesign new symbols for each new map produced.

- Symbols were often changed when new people were hired into GIS mapping positions.

Some managers expressed frustration about symbology and hoped that FEMA would provide some standard symbology that could be used in their local offices. Many looked for infrastructure symbology.

Development of the Matrix

First, a master list of sources where symbols could be found was generated. *(Appendix III)* The second step was to list the hazard and emergency features found in this source list *(Appendix IV)*.
The final step was the depiction of the symbols representing the features on the list.

The symbols were added to a matrix showing:

      Emergency Services
      Other Services
      Emergency Facilities
      Other Facilities
      Natural Hazards
      Technological Hazards
      Crime and Terrorism
      Fire
      Evacuation Symbols
      Miscellaneous Damage and Failure

All symbols depicted on the matrix were identified during the research.
(See Appendix V)

Matrix Findings

As the matrix shows, over 39 different symbology sources were found and used. Symbols depicting hazard and emergency features were extracted and redrawn or scanned into the matrix.

- Developing the matrix highlighted how many different symbols were currently used to represent the same features. For example "medical facilities" were represented by 44 different symbols and "food distribution centers" were depicted by 40 different symbols.

- There are currently no consistent national set of map symbols for the development of hazard and emergency management maps.

The matrix was the result of 6 month of research by two research associates. Clearly, emergency managers with limited time during a disaster cannot afford the time and may not have the skill to research what emergency symbology is valid for application. W. G. Green (2001, p. 78) points out: "If scholars with time to review information, find this frustrating (validating sources), the decision maker forced to make decisions in minutes rather than hours or days can be excused for wondering who or what to trust. "

The hazard and emergency management community has been lamenting the lack of such a set of symbols for some time. The rapid growth and acceptance of GIS systems and data to manage disasters and local emergency response, coupled with the wide array of symbology choices within GIS packages, has contributed to differing interpretations of the appropriate symbology to use for such maps.

As the matrix indicates GIS symbology schemes developed and used by individual federal, state, local and private agencies or businesses are numerous and diversified and often tailored to a specific hazard and emergency applications.

In order to achieve the ultimate level of communication during a crisis, symbols need to be standardized to serve as an effective sign language on maps and graphics.

Redesign of Mapping Symbols

While redesigning hazards mapping symbols, the conventions that already exist within the hazards and emergency management community were taken into consideration. Thus, symbols that are already recognized by the majority of users were developed. *(See Appendix VI)*

These guidelines were applied in the redesign of symbols:
- Symbols should be of simple design.
- Symbols should, if possible, bear a close relationship to the feature it portrays.
- Confusion should be avoided by using symbols for only one feature.

- Symbols should be easily perceived in terms of size, color of symbol or color of background.

- Symbols should have precise meaning without a need for explanation on the map.

Recommendations for the Continuation of the Project

Redesigned symbols need to be reviewed and critiqued by various people who use the symbology. **The services of a focus group is recommended.**

Issues which have not been addressed so far and need attention:
Color:
> color deficiencies (large number of people have color deficiencies)
> color recognition (conventions, identification warm/cold colors)

Cultural issues:
> difference in meaning
> difference in appearance (graphic)

Scale issues:
> large scale maps
> medium scale maps
> small scale maps (how much generalization is needed?)

Technological issues:
> color versus black and white
> can symbols for different cultures be added?

Recommendations for Expansion of this Project

In addition, another issue that came to the forefront through this research is the content of maps. Managers found it difficult to compare various maps because of differences in mapping content. The lack of consistency causes delays and difficulty in the decision making process.

It is recommended that a comprehensive line of research for hazard map standardization requires expansion of this project for investigations into issues to be resolved for:
> **1) map content and**
> **2) line and area indicator symbols.**

Maps are one of the most important management tools in a disaster situation. With the advent of computer mapping packages and geographic information systems (GIS), they have become part and parcel of electronic emergency management or e-emergency management. Green defines e-emergency management as "a system of computer based tools and communications architectures managed by trained personnel using standard plans and procedures to communicate and manipulate data for public information, program management, operational decision making, and policy establishment to protect communities from the effects of disasters." However, he also reveals that it wasn't until 1995 that the Federal Emergency Management Agency listed computers on a supply list for their field-delivery training course EOC'S Management and Operations and referred to the need for a system administrator for disaster computer operations.

Since then, there has been a burgeoning use of electronic emergency management tools at all levels of government enough to indicate that emergency management is on the cusp of an explosion of electronic map making. This is an appropriate time for guidelines and standards for hazard management maps to be created.

Through map symbols, emergency managers, firemen, policemen and citizens understand and communicate about necessary information for responding to a disaster situation. In order to effectively understand the situation at a hand, emergency managers have to be able to expeditiously extract information from the maps they are using. This requires them to know the symbols represented on maps used during emergencies. Developing common symbols and content for emergency managers is a crucial and necessary undertaking.

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Appendix I - Definitions

Selected definitions:
Symbol:

1)   Something that stands for, represents, or denotes something else (not by exact resemblance, but by vague suggestion, or by some accidental or conventional relation); a material object representing or taken to represent something immaterial or abstract, as a being, idea, quality, or condition; a representative or typical figure, sign, token; type (of some quality)
- The word first appeared in print using this definition in the year 1590

2)   A written character or mark used to represent something; a letter, figure or sign conventionally standing for some object, process, etc.
- The word first appeared in print using this definition in the year 1620

Symbolic:

1)   Having the character of a symbol or representative sign or mark; constituting or serving as a symbol (*of* something).
 - The word first appeared in print using this definition in the year 1680

2)   Consisting of, denoted by, or involving the use of written symbols or significant characters.
- The word first appeared in print using this definition in the year 1656

3)   Expressed, denoted, or conveyed by means of a symbol or set of symbols; concerning, involving, or depending upon representation by symbols; also, dealing with or using symbols.
- The word first appeared in print using this definition in the year 1684

Symbology:

1)   The science or study of symbols; *loosely,* the use of symbols or symbols collectively; symbolism.
- The word first appeared in print using this definition in the year 1840

Symbologist (rare):

1)   One versed in symbology
 - The word first appeared in print using this definition in the year 1864

Symbolism:

1)   a. The practice of representing things by symbols, of giving a symbolic character to objects or acts; the systematic use of symbols; hence, symbols collectively or generally.
  - The word first appeared in print using this definition in the year 1654

b. A symbolic meaning attributed to natural objects or facts
- The word first appeared in print using this definition in the year 1835

c. Symbolical figures (rare)
- The word first appeared in print using this definition in the year 1876

      d.   The use of symbols in literature or art; the principles or practice of the Symbolists (those who use symbolism in literature or art)
- The word first appeared in print using this definition in the year 1866

2)   The use, or a set or system, of written symbols
- The word first appeared in print using this definition in the year 1864

Webster's New World Dictionary and Thesaurus (1996)

Definitions:

Symbol:

1)   An object used to represent something abstract

2)   A mark, letter, etc. standing for a quality, process, etc., as in music or chemistry

3)   *Synonyms:* representative, token, figure, sign

Symbolic:

Synonyms: representative, typical, indicative, suggestive, symptomatic, characteristic

Symbolism:

1)   Representation by symbols

2)   A system of symbols

3)   Symbolic meaning

Symbolize:

1)   To be a symbol of; stand for

2)   To represent by a symbol or symbols
Synonyms: typify, signify, express, mean

Appendix II - Web Search and Email Contacts:

Website Address	Organization/Notes
http://www.abag.ca.gov/bayarea/eqmaps/liquefac/real18/	ABAG Earthquake (eq) maps/info
http://www.oas.org/en/cdmp/hazmap/htm	Caribbean Disaster Mitigation Project
http://www.oas.org/en/cdmp/mapmatrix.htm	Caribbean Disaster Mitigation Project
http://www.oas.org/en/cdmp/contacts.htm	Caribbean Disaster Mitigation Project
http://www.esri.com/hazards/makeup.html	ESRI
http://www.em.gov.bc.ca/mining/geolsurv/surficial/default.htm	British Columbia (Files too large to print. Geologic/eq. related)
http://www.fema.gov/impact	FEMA: Project Impact
http://www.idahogeology.org	Idaho Geology Survey and Mapping
http://ltgwww.gsfc.nasa.gov/geowarn/dbtoc/project0406.html	Geoscience Australia
http://www.conserv.ca.gov/dmg/shezp	Seismic Hazards Map Program (Maps too large too print
http://www.conserv.ca.gov/codes/prc/chap7-8.htm	Seismic Hazards Map Program
http://www.pmel.noaa.gov/tsunami	NOAA: Tsunami Research Project
http://www.pmel.noaa.gov/tsunami/time/maps/index.shtml	NOAA: Tsunami Research Project
http://www.pmel.noaa.gov/tsunami/time/library/index.shtml	NOAA: Tsunami Research Project
http://www.pmel.noaa.gov/oerd	NOAA: Ocean Environment Research Division
http://www.pmel.noaa.gov/oar	NOAA: Oceanic and Atmospheric Research
http://www.pdc.org/	Pacific Disaster Center
http://www.oregongeology.com	DOGAMI: Department of Geology and Mineral Industries
http://www.dced.state.ak.us/mra/Mradland.htm	AK: Land Management and Mapping Division
http://www.ak-prepared.com	AK: Division of Emergency Services
http://www.dca.state.fl.us/fdem	FL: Emergency Management
http://www.state.us.epd	SC: Emergency Preparedness Division
http://www.txdps.state.tx.us/dem/	TX: Dept. of Public Safety
http://www.mapinfo.com	MapInfo
http://www.un.org	United Nations
http://www.un.org/Depts.Cartographic/english/index.htm	United Nations Cartographic Section
http://www.unesco.org	UNESCO
http://www.worldbank.org	World Bank
http://wwwl.worldbank.org/prem.askus.htm	World Bank
http://www2.state.ga.us/GEMA	GA EMA
http://www.dem.dcc.state.nc.us	NC EMA
http://www.aema.state.al.us/	AL EMA
http://www.onenet.net/~odcem/	OK EMA
http://www.oem2.state.co.us/oem/oemindex.htm	CO EMA
http://www.ink.org/public/kdem/index.html	KS EMA
http://www.state.ia.us/government/dpd	IA EMA
http://www.dtra.mil	Defense Threat Reduction Agency
http://www.nebema.org	NE EMA
http://www.nysemo.state.ny.us	NY EMA
http://www.state.il.us/iema	IL EMA
http://www.state.sd.us/military/sddem.htm	SD EMA
http://www.memaorg.com	MS EMA
http://www.dsf.pema.state.pa.us/pema/site/default.asp	PA EMA
http://www.vdes.state.va.us	VA EMA
http://www.tnema.org	TN EMA
http://www.state.oh.us/odps/division/ema	OH EMA

Website Address	Organization/Notes
http://www.riskinstitute.org	PERI
http://www.adpc.ait.ac.th	Asian Disaster Preparedness Center
http://www.emergencymanagement.org/states	Asian Disaster Preparedness Center
http://www.mapsymbols.com	Asian Disaster Preparedness Center
http://www.goldensoftware.com/	Asian Disaster Preparedness Center
http://www.riskworld.com/websites	Asian Disaster Preparedness Center
http://www.unige.ch/hazards/	National Disaster Mitigation Group: Univ. of Geneva, Switzerland
http://quake.abag.ca.gov/	California Seismic Hazards Mapping Act/Info
http://chartmaker.ncd.noaa.gov	NOAA: Office of Coast Survey
http://nweb18.worldbank.org/institutional/EFeedBk.nsf/MainTopic	World Bank Contact Page
http://lists.directionsmag.com/discussion	MapInfo Listserve for users
http://www.ecai.org	Electronic Cultural Atlas Initiative, UCBerkley, CA
http://www.dcema.dc.gov/main.shtm	Washington DC: EMA
http://www.cdc.org	CDC, Atlanta, GA
http://edcnts2.cr.usgs.gov	Natural Hazards in Central America
http://picto.dpri.kyoto-u.ac.jp/home.html	Japan: Pictogram System for Natural Disaster Planning

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NOAA: pmel	OR		web	time-support@pmel.noaa.gov	
NOAA: pmel	MD		web	webteam@oar.noaa.gov	
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County EMA	OH	Hamilton	Peggy Dziech	Peggy.Dzeich@hamilton-co.org	513-851-7081
County EMA	OH	Fairfield	Dave Burgei	dburgei@co.fairfield.oh.us	740-687-7122
County EMA	OH	Holmes	Dennis Fitzpartick	hcema@valkyrie.net	330-674-0989

Agency/Contact	ST	County	Name	Email	Phone
County EMA	OH	Lucas	WM. Halsey	whalsey@co.lucas.oh.us	419-213-6503
County EMA	OH	Monroe	Richard Schuerman	monema@1st.net	740-472-2144
County EMA	OH	Tuscaraw.	Patty Levengood	ema@tusco.net	740-498-7078
County EMA	OH	Wash.	Jeff Lauer	emajeff@wirefire.com	740-373-5613
County EMA	OH	Wash.	Robert Badger	engineer@washingtongov.org	740-376-7430
County EMA	OH	Wood	Jonathan Larson	jlarson@co.wood.oh.us	419-354-9269
County EMA	KS	Shawnee	Tom Wiencek	tom.wiencek@ucb-group.com	785-276-3424
County EMA	OK	Cleveland	John Dutch	john.dutch@ci.norman.ok.us	405-292-9780
County EMA	LA	New Orl.	web mail	jimmiea@yahoo.com	
County EMA	NY	NYC	web mail		
County EMA	NY	NYC	Kevin Keenan	Kkeenan@OEM.NYC.GOV	718-422-4814
County EMA	NY	Cayuga	web mail	ccoes@co.cayuga.ny.us	315-255-1161
County EMA	SC	Richland	Michael Byrd	michaelbyrd@richlandonline.com	803-254-9296
County EMA	IA	Polk	Robt. Goldhammer	polk.county@emd.state.ia.us	513-296-2107
County EMA	IA	Polk	Justin Dehner	Jdehner@co.polk.ia.us	
Australia Geoscience			web mail	http@agso.gov.au	
Org. of American States, DC	DC		Stephen Bender	natural-hazards-project@oas.org	202-458-6296
Emer. **M**gmt. **A**ustralia			Jonathan Abrahams	jabrahams@ema.gov.au	61-02-6266-5219
Pacific **D**isaster **C**enter			David Blaeholder	webmaster@pdc.org	808-891-0525 x14
(ARCES)			Paul Trezie	p.trezie@auslig.gov.au	61-2-6201-4100
Asian Diaster Prepardness Center	Tha.		weblink	adpc@ait.ac.th	66-2-524-5354
World Bank: Data Development Group			Anat Lewin	info@worldbank.org	
World Bank: Data Development Group			Jeff Lecksell	jlecksell@worldbank.org	202-473-1500
UN	NY		Carl Section	cartog@un.org	
UNESCO			webmaster	webmaster@unesco.org	
Oregon State Fire Marshall	OR		Bob Albers	Albers.Bob@state.or.us	
Map Ingo	NY		Angela Girard	press@mapinfo.com	518-285-7114
AK Div. of Emer. Mngmnt	AK		R. Scott Simmons	scott_simmons@ak-prepared.com	907-428-7016
Gov. Office of Em. Services	CA		Richard Eisner	Rich_Eisner@oes.ca.gov	510-286-0888
Earthquake Program Civil Defense	HI		Brian Yanagi	byanagi@scd.state.hi.us	808-733-4300 x522
Oregon Emergency Mngmnt	OR		Mark Darienzo	mdarien@oem.state.or.us	503-378-2911 x237
WA State Military Dept. EM Div	WA		George Crawford	g.crawford@emd.wa.go.	253-512-7067
AK Div. of Emer. Mngmnt	AK		Laurie Cummings	Laurie_Cummings@ak-prepared.com	907-428-7069
Ak Natural Resources (ADNR)	AK		Rod Combellick	rod_combellick@dnr.state.ak.us	
MapInfo	MD		Jim Blakeslee	Jim_Blakeslee@mapinfo.com	301-654-2218
MapInfo	MD		Jim Blakeslee		301-654-2219
MapInfo	MD		Jim Blakeslee	http://lists.directionsmag.com/discussion/	
DOGAMI	OR		Paul Staub	paul.staub@dogmai.state.or.us	
MapInfo User Group, Portland, OR	OR		Dick Karman	dkarman@police.ci.portland.or.us	
MapInfo User Group, N. Zealand	NZ		Simon N.	simonn@napier.govt.ns	
Senior Hazards Analyst: EMA	WA		Allen Jakobitz	a.jakobitz@emd.wa.gov	253-512-7050
GIS Analyst Em. Services	CA		Kevin Miller	Kevin.Miller@oes.ca.gov	510-286-0817

Agency/Contact	ST	County	Name	Email	Phone
State EMA	GA		V. Bartlett	vbartlett@gema.state.ga.us	404-635-7000
Director, NCEMA	NC		Eric Tolbert	etolbert@ncem.org	919-733-3825
State EMA: Public Info Manager	AL		Scott Adcock	info@aema.state.al.us	205-280-2247
State EMA: Public Info Manager	OK		Michelann Ooten	michelann.ooten@dem.state.ok.us	
State EMA: Cartography Section	CO		Marv Koleis	Marv.Koleis@state.co.us	303-273-1622
DC EMA	DC		online ink only	sent to online link	
KS EMA	KS		online ink only	emergencymgnt@ink.org	785-274-1409
IA EMA	IA		Jonathan Paoli	Jon.Paoli@emd.state.is.us	515-323-4384
IN EMA	IN		A. Taylor	ataylor@sema.state.in.us	
MD EMA: Public Info Officer	MD		John Healy	jhealy@mema.state.md.us	877-MEMAUSA
Defense Threat Reduction Agency				dtra.publicaffairs@dtra.mil	800-701-5096
NE EMA: Public Info Officer	NE		Tim Hergenrader	tim.hergenrader@nema.state.ne.us	( )-471-7428
NY EMA: webmail	NY		webmail	postmaster@semo.state.ny.us	518-457-2200
NCEMA: Technical Services	NC		Don Heard	Don_Heard/State/NCEM@dem.dcc.state.nc.us	
CUSEC (Central US Earthqk. Consortm	IN		Jim Wilkinson	jwilkinson@cusec.org	
EMA Webmaster	IL		webmaster	iema_webmaster@state.il.us	
EMA web address	SD		Deanne Booth	deanne.booth@state.sd.us	605-773-3231
Public Info Officer	LA		Terry Thompson	tthompson@loep.state.la.us	225-342-9384
Public Info Officer	MS		Amy Bissell	abissell@memaorg.com	800-222-6362
Weblink for e-mail	VA		Public Affairs Office	pio@vdem.state.va.us	804-897-6510
Public Info Officer	TN		Kurt Pickering	kpickering@tnema.org	615-741-0482
Public Info Officer	OH		Dick Kimmins	dkimmins@dps.state.oh.us	614-799-3695
International Land Mine Project	DC		Aldo Benini	abenini@dclink.com	703-979-0034
CDC	GA		weblink	http://www.cdc.gov/netinfo.htm	
PERI			Dennis Kouba	dkouba@riskinstitute.org	
ODNR	OH		Cindy Crecelius	cindy.crecelius@dnr.state.oh.us	614-265-6754
ODNR	OH		Darlene Margold	Darlene.Margold@dnr.state.oh.us	614-265-6722
ODNR	OH		Paul Spahr	paul.spahr@dnr.state.oh.us	614-265-6739
National Imagery Mapping Agency	MD		Ann Marie Willis	awillis3@ix.netcom.com	301-299-1898
NCSU: Nat. Hazard Mapping Prog.	NC		Margery Overton	overton@eos.ncsu.edu	919-515-7908
Golden Software, Inc.	CO		web address	info@goldensoftware.com	800-972-1021
Golden Software, Inc.	CO		Todd Ousley	todd@goldensoftware.com	303-279-1021
Natural Disater Mitigation Group	SWZ		webmaster	cerg@unige.ch	
University of Geneva					

Appendix III - Master List of Sources for Symbology

Military – MIL-STD-2525B Appendix A, Appendix D

METT-TC - Military METT-TC: The Graphic Representation of the Civil Component

METOC - MIL-STD-2525B Appendix C, Meteorological and Oceanographic (METOC)
   Symbology

USGS Topographic Map Symbols

NOAA – National Oceanic Atmospheric Administration

NCUTCD – National Committee on Uniform Traffic Control Devices (NCUTCD)

World Bank – World Bank Cartographic, Chart and Graph Symbolism, Administrative Services
 Department, 1978

GIS Unit EM - Division of Emergency Management GIS Unit

Japan: Pictogram - Japan: Pictogram System for Natural Disaster Reduction

EMIS OES – Centro de Entrenamiento de Bomberos Profesionales

NWA – http://www.nwas.org, National Weather Association

Stanford – Environmental Health and Safety Department, Stanford University

ER Handbook – Kent State University Department of Public Safety and Campus Environment
   and Operations, Emergency Response Handbook

Unit Transfer – Unit Transfer Symbols, Williams and Heintz Map Corporation

U W & C – Understanding Weather and Climate, Second Edition, Edward Aguado, James E.
    Burt, 2001

Cartographic Journal – The Cartographic Journal, The British Cartographic Society, Volume
       25, Number 1, June 1988

Signet Signal Symbol – Signet Signal Symbol: Handbook of International Signs, ABC Verlag
       Zurich, Switzerland, 1970

Symbol Source Book – Symbol Source Book, H. Dreyfuss, McGraw Hill Companies, NY, 1976

Modley, R. (1976). *Handbook of Pictorial Symbols* Dover Publications Inc., NY.
       ADCA – Australian Department of Civil Aviation

ADV – German Airport Authority

ATA – Air Transport Association

BAA – British Airports Authority

D/FW – Dallas-Fort Worth

D.O.T. '74 – Department of Transportation, 1974

D.O.T. Hazard – D.O.T. Hazard Labels

European Road - European Road Signs

IATA – International Air Transport Association

ICAO – International Civil Aviation Organization

KFAI Sweden

LVA – Las Vegas Airport

Netherlands Statistical Foundation

Nova Scotia – Nova Scotia Department of Tourism

NPS – National Park Service

NRR – Netherlands Railroad

O' 64 – Olympic Games, Tokyo, 1964

        O '68 – Olympic Games, Mexico, 1968

        O '72 – Olympic Games, Munich, 1972

        Pg - Picto' grafics, Paul Arthur, VisuCom Ltd., Toronto, 1974

        Pictografic Safety – Pictografic Safety Signs for Factories, Industrial Parks, Industrial
            Complexes

Port – Port Authority of New York and New Jersey

        SP – Swedish Standard Recreation Symbols

        S/TA – Seattle-Tacoma Airport

        TA – Tokyo Airport

        TC – Transport Canada, Airports

        UIC – International Union of Railways

US Road - United States Road Signs

        WO' 72 – Winter Olympic Games, Sapporo, 1972

X '67 – Expo 1967, Montreal

X '70 – Expo 1970, Osaka

ESRI Weather Icons

ESRI Hazmat Icons

ESRI Forestry Icons

<div align="center">

Clickart

Cameo

MapInfo

</div>

Microsoft XP

Dingbats - Corel Draw "dingbats" font

Zapf Dingbats (Adobe)

Natural Hazards - Natural Hazards Informer, January 2002

Weather Station – The McGraw-Hill Companies, Inc., Weather Station Data Plot

NYCity Map - FEMA GIS New York City Map (September 11, 2001 World Trade Center)

<div align="center">

Paskaville Map

</div>

Air Force – http://www.af.mil/, Air Force Website

ARMY – http://www.army.mil/, Army Website

USACE – http://www.usace.mil/, Army Corps of Engineers Website

USCG – http://www.uscg.mil/uscg.shtm, Coast Guard Website

Vet Assoc. – http://www.avma.org/, Veterinary Association Website

Work Safe – http://www.worksafebc.com, Hazard SYMBOLS key booklet

Atmos UCLA – http://www.atmos.ucla.edu/weather/about_IR.html

Appendix IV- Hazard and Emergency Features Found in Source List

Military
-Fire
-Bomb
-Hijacking (Airplane)
-Hijacking (Boat)
-Food Distribution
-Mortuary
-Medical
-Veterinary

METT-TC
-Civil Institution
-Water (Sources)
-Food (Sites)
-Shelter (Sites)
-Police
-Medical (Site)
-Sewage Treatment Plant
-Education
-TV Broadcasting
-Radio Broadcasting
-Religion

METOC
-Rain
-Snow
-Hail
-Ice Pellets
-Thunderstorm
-Tornado
-Lightning
-Tropical Storm
-Fog
-Smoke
-Hurricane

USGS
-School
-Church
-Water
-Railroad

NOAA
-Wind Speed and Direction

NCUTCD
-Landslide

-Evacuation Route
-Dam
-Railroad

World Bank
-Airplane
-Dam
-Hospital

GIS Unit EM
-Airport
-Animal Related
-Bridge
-Church
-Clinic
-Communications
-Correctional Facility
-Disaster Field Office
-Electrical
-Emergency Medical
Services
-Emergency Operation
Center
-Evacuation Route
-Fire Department
-Fuel Storage
-Hazardous Material
-Heliport
-Hospital
-Landfill, Active
-Landfill, Inactive
-Landing Zone
-Marine Resources
-Mobile Home Park
-Police Department
-Potable Water
-Radioactive
-Recovery Center
-Red Cross
-School
-Sewage Treatment
-Shelters
-Handicapped
-Traffic Control
-Water Treatment Plant

Japan: Pictogram
-Alarm
-Disrupted Highway
-Emergency Operation
Center
-Emergency Shelter
-Fire Extinguisher
-First Aid Station
-Food Supply Point
-Relief Goods
-Safety
-Water Supply Point

EMIS OES
-Rioting
-Explosion
-Access/Crowd Control
-Civil Disturbance
-Criminal Activity
-Looting
-Aftershock
-Building Collapse
-Building Damage
-Earthquake
-Hospital Collapse
-Hospital Damage
-Hospital Evacuation
-Structure Collapse
-Structure Damage
-Casualty Call Point
-Deceased
-EOC Open
-Evacuation
-Evacuation Center
-Evacuation Route
-Fatality Call Point
-Injuries
-Rescue
-Search and Rescue
-Shelter Open
-Urban Search and Rescue
-Fire
-Hospital Fire
-Dam Collapse
-Dam Damage
-Dam Overflowing
-Flood (point)

-Flood Control System Damage
-Landslide
-Mudflows
-Tsunami
-Camp
-Fire Break (Planned or Incomplete)
-Fire Origin
-Fire Spread Prediction
-Fire Station
-First Aid Station
-Helibase
-Helispot
-Incident Base
-Incident Command Post
-Mobile Weather Unit
-Spot Fire Hot Spot
-Staging Area
-Telephone
-Uncontrolled Fire Edge
-Water Source
-Wind Speed and Direction
-Area Closure
-Computer System Failure
-Hospital Power Outage
-Hospital Water Loss
-Low Water Pressure
-Paging System Failure
-Power Failure
-Radio Failure
-Sewage System Damage
-Sewage System Inoperable
-Telephone Failure
-Undefined
-Water Outage
-Water System Damage
-Water System Inoperable
-Gas Main Leak
-Hazardous Material
-Radiological
-Toxic Cloud
-Bomb Threat
-Bomb Located
-Terrorism
-Terrorism Activity
-Bridge Collapse
-Bridge Damage
-Freeway Collapse
-Freeway Damage

-Road Closure
-Roadway Collapse
-Roadway Damage
-Traffic Control
-Train Derailment

NWA
-Lightning
-Rain

Stanford
-Fire Extinguisher

ER Handbook
-Siren
-Fire
-Tornado
-Snow
-Electrical Power Outage
-Bomb Threat
-Phone
-Communication
-Hazardous Material

Unit Transfer
-Airport

U W & C
-Smoke
-Lightning
-Fog
-Rain
-Tornado
-Thunderstorm
-Ice Pellets
-Wind Speed and Direction

Cartographic Journal
-Emergency Exit
-Handicapped
-Restroom

Signet Signal Symbol
-Airport
-Coast Guard
-Explosive
-Fire
-Food
-Handicapped
-Information

-Lightning
-Medical
-Men's Restroom
-Women's Restroom
-No Entry
-Parking
-Police
-Poison
-Power
-Radioactive
-Telephone
-Police Car
Symbol Sourcebook
-Airport
-Alarm
-Ambulence
-Avalanche
-Biohazard
-Bridge
-Building
-Caution
-Church
-Coast Guard
-Fire
-Exit
-Fire Extinguisher
-Food
-Handicapped
-Heliport
-Hospital
-Information
-Landslide
-Lava Flow
-Lightning
-Medical
-Men's Restroom
-Women's Restroom
-Restroom
-No Entry
-Parking
-Poison
-Police
-Power
-Radio
-Radioactive
-Railroad
-School
-Shelter
-Snow
-Telecommunications

-Telephone
-Trailer Site
-Trash
-Volcano
-Water-Dam
-Fog
-Hail
-Hurricane
-Ice Pellets
-Rain
-Thunderstorm
-Tornado
-Tropical Storm
-Wind Speed and Direction

ADCA
-Telephone
-Women's Restroom
-Men's Restroom
-Information
-Airport
-Food

ADV
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Restroom
-Information
-Airport
-Heliport
-Food
-Railroad
-No Entry

ATA
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Information
-Parking

BAA
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Information

-Airport
-Food
-No Entry
-Restroom

D/FW
-Telephone
-Medical
-Men's Restroom
-Women's Restroom
-Restroom
-Information
-Heliport
-Food
-Parking
-No Entry

D.O.T. '74
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Restroom
-Information
-Railroad
-Airport
-Heliport
-Food
-Parking
-Handicapped

D.O.T. Hazard
-Poison
-Radioactive
-Flammable Gas
-Flammable Solid
-Non-Flammable Gas
-Explosive

European Road
-Parking
-Airport
-Caution
-Railroad
-No Entry
-Information
-Medical
-Telephone
-Food

-Trailer Sites

IATA
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Information
-Railroad
-Food
-No Entry

ICAO
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Restroom
-Information
-Railroad
-Food
-No Entry
-Water

KFAI
-Exit
-Water
-Handicapped
-No Entry
-Parking
-Food
-Information
-Restroom
-Women's Restroom
-Men's Restroom
-Telephone

LVA
-Airport
-Food
-Restroom

Netherlands
-Bridge
-Poison
-Fuel Storage
-Airport
-Relief Goods
-Power
-Coast Guard

-Telephone
-Helicopter

Nova Scotia
-Information
-Telephone
-Medical
-Hospital
-Church
-Coast Guard
-Shelter
-Building
-Television
-Food
-Trailer Site
-Water
-Power
-Women's Restroom
-Men's Restroom
-Restroom

NPS
-Airport
-Coast Guard
-Dam
-Fire
-Medical
-Food
-Handicapped
-Information
-Landslide
-Women's Restroom
-Men's Restroom
-Restroom
-Parking
-Shelter
-Water
-Relief Goods
-Trailer Sites
-Telephone

NRR
-Airport
-Food
-Information
-Men's Restroom
-Women's Restroom
-Restroom
-No Entry
-Railroad

-Telephone

O '64
-Exit
-Medical
-Food
-Hospital
-Information
-Men's Restroom
-Women's Restroom
-Restroom
-Telephone

O '68
-Medical
-Food
-Information
-Women's Restroom
-Men's Restroom
-Telephone

O '72
-Airport
-Exit
-Fire Hydrant
-Fire Department
-Medical
-Food
-Handicapped
-Heliport
-Information
-Men's Restroom
-No Entry
-Parking
-Evacuation
-Police
-Power
-Railroad
-Red Cross
-Restroom
-Telephone
-Vehicle Evacuation
-Women's Restroom
-Airport
-Church
-Poison
-Exit
-Fire Hydrant
-Medical
-Food

-Handicapped
-Hospital
-Information
-Men's Restroom
-No Entry
-Parking
-Police
-Railroad
-Smoke
-Telephone
-Trailer Site
-Television
-Warning
-Women's Restroom

Pictografic Safety
-Alarm
-Explosive
-Radioactive
-Fire Extinguisher

Port
-Medical
-Food
-Information
-Men's Restroom
-Women's Restroom
-No Entry
-Telephone

SP
-Airport
-Caution
-Water
-Fire
-Fire Department
-Medical
-Food
-Handicapped
-Heliport
-Information
-Men's Restroom
-No Entry
-Railroad
-Telephone
-Trash
-Women's Restroom

S/TA
-Medical

-Food
-Information
-Men's Restroom
-No Entry
-Parking
-Telephone
-Women's Restroom

TA
-Food
-Information
-Men's Restroom
-Women's Restroom
-Restroom
-No Entry
-Parking
-Telephone

TC
-Medical
-Food
-Handicapped
-Information
-No Entry
-Parking
-Police
-Restroom
-Telephone

UIC
-Airport
-Exit
-Medical
-Food
-Information
-Women's Restroom
-Men's Restroom
-Restroom
-No Entry
-Power
-Railroad
-Telephone
-Water

US Road
-Telephone
-Trailer Site
-No Entry
-Hospital
-School

WO '72
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Information
-Food
-Parking
-No Entry
-Police

X '67
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Food
-No Entry
-Exit
-Power
-Hospital
-Handicapped
-Relief Goods
-Coast Guard

X '70
-Telephone
-Medical
-Women's Restroom
-Men's Restroom
-Information

ESRI Weather
-Thunderstorm
-Tornado
-Rain
-Snow
-Blizzard
-Lightning
-Hail
-Ice Pellets
-Watch Box-Severe Storm
-Watch Box-Tornado
-Smoke/Smog
-Fog
-Storm Warning
-Hurricane Warning
-Gale Warning
-Hurricane

-Typhoon
-Tropical Storm
-Wind Speed and Direction

ESRI Hazmat
-EMT
-Fire Rescue
-Fire Hydrant
-Combustible
-Dangerous
-Flammable
-Flammable Gas
-Flammable Solid
-Fuel Oil
-Non-Flammable Gas
-Radioactive
-Poison
-Assembly Area
-Staging Area
-Airbase
-Helibase
-Helipad
-Control Center
-Control Point
-Base Camp
-Fire Origin
-Spot Fire
-Fire Direction
-Emergency Exit
-Handicapped
-Fire Hydrant
-Not an Exit
-Use Stairs
-Do Not Use Elevator-Fire
-Fire Escape
-Telephone
-Refuge Area
-Burnt Area
-Bell
-Speaker/Horn
-Fire Truck
-Directional Arrow

ESRI Forestry
-Drinking Water
-Fire
-Dam
-Danger
-First Aid
-Information

-Heliport
-Marina (Coast Guard)
-Parking
-Food
-Restroom
-Radio
-Telephone
-Shelter
-Fire Origin
-Incident Command Post
-Incident Base
-Helibase
-Fire Station
-Water Source
-Mobile Weather Unit
-Staging Area
-Spot Fire
-Hot Spot
-Helispot
-Specified Exit Ramp
-Bridge
-Traffic Control Device

Clickart
-Fire
-Fire Extinguisher
-Rain
-Thunderstorm
-Radioactive
-Hazardous Material
-Medical

Cameo
-Hazardous Material
-Biohazard
-Radioactive
-City Hall
-School
-Church
-Medical
-Fire Extinguisher
-Fire Hydrant
-Fuel Storage
-Water
-Coast Guard
-Police Car
-Bridge
-Telephone
-Handicapped
-Lightning

-Caution
-Helicopter
-Fire Truck
-Ambulance
-Airplane
-Railroad
-Rain
-Fire
-Hospital
-Evacuation Route
-Nuclear Power Plant
-Communication
-Traffic Control

MapInfo
-Police Car
-Railroad
-Ambulance
-Police Department
-Fire Department
-City Hall
-Caution
-Church
-Shelter
-Hospital
-Fire Truck
-Fire Hydrant
-Food
-Radio Tower

Microsoft XP
-Police Car
-Fire Truck
-Ambulance
-Tornado
-Lightning
-Airplane
-Shelter
-City Hall
-Food

Dingbats
-Thunderstorm
-Rain
-Lightning
-Tornado
-Snow
-Hurricane
-Smoke
-Blizzard

-Ice Pellets
-Church
-School
-Coast Guard
-Hazardous Material
-Medical
-Snow
-Shelter
-Radioactive
-City Hall
-Handicapped
-Telephone
-Fuel Storage
-Emergency Operation
        Center
-Airport

ZapfDingbats
-Snow
-Medical
-Telephone
-Airplane
-Church
-Hospital

Natural Hazards
-Flooding
-Lightning
-Tornado
-Earthquake

Weather Station
-Snow
-Fog
-Thunderstorm
-Rain
-Wind Speed and Direction

NYCity Map
-Temporary Morgue
-U.S. Army Corps of
Engineers
-US&R
-ICP
-Ambulance Staging Area
-Heliport
-Approved Food Stations
-US Coast Guard

Paskaville Map

-Radio, TV Station
       -Town Hall
-Hospital
-High School
-Christian (Church)

Air Force
-Air Force

ARMY
-Army

USACE
-Army Corps of Engineers

USCG
-Coast Guard

Vet Assoc.
-Veterinary

Work Safe
-Radioactive
-Poison
-Hazardous Material
-Flammable
-Fire Extinguisher
-Danger/Caution
-Biohazard
-Fuel Storage

Atmos UCLA
-Wind Speed and Direction
-Rain
-Thunderstorm
-Lightning
-Snow
-Ice Pellets
-Fog
-Smoke
-Tropical Storm
-Hurricane

Appendix V – Matrix

Emergency Facilities - 1

Facilities	Signet Signal Symbol	GIS Unit EM	ESRI Forestry	Clickart	Zapf Dingbats	Japan Pictogram	Symbol Source Book	O 72	SP
Medical									

Facilities	Nova Scotia	NPS	O 84	O 68	Pg	Port	STA	UIC	TC	WO 72	X 67	X 70
Medical												

Facilities	Military	METT TC	Carrico	EMIS OES	Dingbats	ADV	ATA	BAA	D/FW	D.O.T. 74	European Road	IATA	ICAO
Medical													

Facilities	Symbol Source Book	Symbol Source Book	ESRI Forestry	SP	METT-TC	GIS Unit EM	EMIS OES	Japan Pictogram	Carrico	USGS	ICAO	KFAI	Nova Scotia	NPS	UIC
Water Distribution															

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Emergency Facilities - 2

Facilities	Military	GIS Unit EM	NYCity Map	Cameo	Passerville Map	Zapf Dingbats	Work Bank	O 72	Symbol Source Book	Nova Scotia	O 94	Pg	US Road	X '67
Red Cross														
Hospital														
Recovery Center														
Mortuary														
Casualty Call Point														
Fatality Call Point														

Emergency Facilities - 3

Facilities	Signal Signal Symbol	Symbol Source Book	D72	STA	TA	Military	METT-TC	ESRI Forestry	NYCity Map	MapInfo	Microsoft XP
Food Distribution											

Facilities	NPS	ADCA	ADW	BAA	DFW	D.O.T. 74	European Road	IATA	ICAO	KFAI	LVA	Nova Scotia
Food Distribution												

Facilities	NPS	NBR	O84	O63	Pg	Port	SP	TC	UIC	WO72	X67	Japan Pictogram
Food Distribution												

Facilities	METT-TC	GIS Unit EM	ESRI Forestry	ESRI Hazmat	EMIS OES	MapInfo	Microsoft XP	Japan Pictogram	Dingbats	Symbol Source Book	Nova Scotia	NPS
Shelter Sites												

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Other Facilities - 1

Facilities	Symbol Source Book	Symbol Source Book	Dingbats	Paskaville Map	MapInfo	Cartec	GIS Unit EM	Zapf Dingbats	METT-TC	USGS	Nova Scotia	Pg	US Road
Church													
School													

Facilities	Symbol Source Book	Symbol Source Book	Signet Signal Symbol	Signet Signal Symbol	Nether-lands	GIS Unit EM	Canneo	Zapf Dingbats	Microsoft XP	World Bank	Directors	Unit Transfer
Airport												

Facilities	APCA	ADV	R44	D.O.T. 74	Eurosean road	TVA	NPS	NFR	O'92	Pg	SP	UIC
Airport												

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Other Facilities - 2

Facilities	Symbol Source Book	SP	GIS Unit FM	MFFT-TC	Camo	ESRI Hazmat	Dinghats	Work Safe	Nether-lands
Trash									
Active Landfill									
Inactive Landfill									
Sewage Treatment Plant									
Water Treatment Plant									
Fuel Storage									

Other Facilities - 3

Facilities	Military	METT-TC	GIS Unit EM	Cameo	Pascalville Map	Microsoft XP	Dingbats	MapInfo	ESRI Harvest	Vet Assoc.
Veterinary										
Landing Zone										
Airbase										
City/Town Hall										
Correctional Facility										

Facilities	Carto-graphic Journal	FSRI Forestry	Symbol Source Book	ADV	BAA	DFW	D.O.T. 74	ICAO	KPAI
Restroom									

Facilities	TVA	Nova Scotia	NPS	NRR	OV4	O'92	SP	T4	TC	UIC
Restroom										

Other Facilities - 4

Facilities	Signet Signal Symbol	Symbol Source Book	ESRI Forestry	ADCA	ADV	ATA	BAA	DFW	D.O.T. 72	IATA	ICAO	KFAI	Nova Scotia
Men's Restroom													

Facilities	NRR	O/52	O72	ESRI Forestry	ADCA	P2	ATA	BAA	S/T4	DFW	TA	UIC	WO72	ICAO	KFAI	X67	Y70	NPS
Men's Restroom																		

Facilities	Signet Signal Symbol	Symbol Source Book	ESRI Forestry	ADCA	ADV	ATA	BAA	DFW	D.O.T. 72	IATA	ICAO	KFAI	Nova Scotia
Women's Restroom													

Facilities	NRR	O/52	O72	ESRI Forestry	ADCA	P2	ATA	BAA	S/T4	DFW	TA	UIC	WO72	ICAO	KFAI	X67	Y70	NPS
Women's Restroom																		

33

Emergency Services - 1

Fire	ESRI Hazmat	Cameo	Clickart	MapInfo	Microsoft XP	Japan Pictogram	Work Safe	Stanford	Symbol Source Book	Pictografic Safety	O ??	Pg
Fire Extinguisher												
Fire Hydrant												
Fire Truck												

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Emergency Services - 2

Search and Rescue	EMS UES	NYCity Map
Rescue	R	
Standard Rescue	R	

Fire	GIS Unit EM	ESRI Forestry	ESRI Hazmat	EMS UES	MapInfo	U 72	SP
Fire Department		F		F	FD		
Fire Rescue			F				
			F				

EMT	ESRI Hazmat	ESRI Hazmat	ESRI Hazmat	Cameo	MapInfo	Microsoft XP	NYCity Map	Symbol Source Book
EMT								
Ambulance								

Police	METT TC	GIS Unit EM	Cameo	Microsoft XP	MapInfo	Signal Signal Symbol	Symbol Source Book	O 72	Pg	TC	WC 72
Police Department					PD					Police	
Police Car											

Emergency Services - 3

Control Center	Japan Petrogram	Japan Pictogram	Japan Pictogram	GIS Unit FM	ESRI Forestry	ESRI Faaerat	FMIS OES	NYCity Map	Dianghan
Emergency Operation Center	[symbol]	[symbol]	[symbol]	E	[triangle]	CC	[triangle]	[triangle]	[triangle]
	[symbol]	[symbol]	[symbol]			CP	★		
	[symbol]	[symbol]					C		
Base Camp					B	BC	B		
Disaster Field Office				D					
Assembly Area						AA			
Staging Area					S	SA	S		

Emergency Services - 4

Services	Symbol Source Book	Symbol Source Book	Signal Signal Symbol	D'72	FSRI Forestry	AJCA	ADV	A.A	BAA
Information									

Services	O'68	D'Fw	D.O.T.'74	European Road	LATA	ICAD	KFAI	Nova Scotia	NRR	O'64
Information										

Services	Py	Port	SP	S/T4	TA	TC	JIC	X'7C
Information								

Helicopter	FSRI Forestry	FMIS OFS	Cargo	Nether-lands	FSRI Hazmat	O'S Unit EM	NYCity Map	Symbol Source Book	ADV	D'FW	DOT '74	O'72	SP
Heliport													
Helibase													
Helispot													
Helicopter													

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Services	NYCity Map	GIS Unit En	ESRI Forestry	EMIS OES	Cameo	ARMY	USACE	Air Force	Japan: Pictogram	Nether-ands	NPS	X'67
Army Corps of Engineers												
Army												
Air Force												
Mobile Weather Unit												
Traffic Control												
Relief Goods												

Coast Guard	EMIS OES	EMIS OES	Cameo	Symbol Source Book	Dingbats	NYCity Map	GIS Unit EM	ESRI Forestry	USCG	Signet Signal Symbol	Nether-lands	Nova Scotia	NPS	X'67
Coast Guard														

Other Services

Services	Cameo	ESRI Forestry	OIS Unit zM	Paskaville Map	MET-TC	MapInfo	ER Hardbock	Symbol Source Book	Nova Scotia	Pg
Communications										
Radio										
Television										
RadioTV										

Services	Signal Signal Symbol	Signal Signal Symbol	Signal Signal Symbol	Signal Signal Symbol	DFW	Symbol Source Book	Symbol Source Book	Zap Dingbats	FMIS DFS	Dingbats	Cameo	ESRI Forestry	ESRI Hazmat	ER Hardbook	ADCA
Telephone															

Services	ALV	ATA	BAA	DFW	D.O.T. 71	European Road	IATA	ICAO	KFAI	Nether-lands	Nova Scotia	NPS	NRA
Telephone													

Services	Pg	O'49	O'58	SP	O'72	SIA	TA	TC	LIC	US Road	WO 72	N 67	X 71
Telephone													

Fire Symbols

Fire Symbols	Smoke
ESRI Weather	
METOC	
Dingbats	
U W & U	
Atmos UCLA	
Ps	

Fire Symbols	EMSIS OES	CltStar	ESRI Forestry	ESRI Hazmat	Cameo	Military	ER Handbook	Wiki Safe	Symbol Source Book	Signal Signal Symbol	NPS	SIT
Fire						FIRE						
Hospital Fire												
Fire Origin			⊗	⊗								
Fire Break												
Spot Fire/Hot Spot	♂		●	✕								
			♂									
Fire Spread Prediction												
Uncontrolled Fire Edge												
Burnt Area				☰								

Technology Hazards	GIS Unit EW	GIS Unit FM	EMIS OFS	Cameo	Cl Tech Client	Dingbats	ESRI Hazmat	ER Handbook	Work Safe	Signet Signal Symbol	Symbol Source Book	D.O.T. Hazard	P&	Netherlands	Pictografic Safety
Hazardous Material															
Radioactive															
Biohazard															
Gas Main Leak															
Toxic Cloud															
Poison															

Technology Hazards - 2

Technology Hazard Symbols	ESRI Hazmat	Work Safe	D.O.T. '72	Signat Signal Symbol	Pictografic Safety
Flammable	(red diamond)	(circle symbol)			
	(red diamond)	(circle symbol)			
Flammable Gas	(red diamond)		(diamond)		
	(red diamond)				
Flammable Solid	(diamond)		(diamond)		
	(diamond)				
	(diamond)				
Non-Flammable Gas	(green diamond)		(diamond)		
	(green diamond)				
Combustible	(red diamond)		(diamond)	(yellow)	(triangle)
	(red diamond)				

Technology Hazard Symbols	ESRI Hazmat	Work Safe	Symbol Source Book	Cimeo	MapInfo	ESRI Forestry	European Road	S?	Pg
Caution	(red diamond DANGER)	(triangle)	(triangle)	(yellow triangle !)	(yellow diamond !)	(XiX)	(triangle)	(symbol)	(symbol)
	(red diamond)	(octagon)	(arrow)						

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Natural Hazards - 1

Weather Related Hazards	Dingbats	Dingbats	Dingbats	Cameo	ESRI Weather	METOC	NWA	Clickart	Weather Station	UW & C	Atmos UCLA	Symbol Source Book
Fog												
Rain												
Hail												

Weather Related Hazards	Symbol Source Book	Symbol Source Book	Zapf Dingbats	Zapf Dingbats	Dingbats	ESRI Weather	METOC	Weather Station	ER Handbook	UW & C	Atmos UCLA	NOAA
Ice Pellets												
Snow												
Blizzard												
Wind Speed and Direction												

Natural Hazards - 2

Weather Related Hazards	Dingbats	Dingbats	Clickart	ESRI Weather	METOC	Weather Station	Natural Hazards	Microsoft XP	Cameo	GIS Unit FM	NWA	ER Handbook	UW & C	Atmos UCLA	Symbol Source Book
Thunderstorm															
Lightning															
Tornado															

Natural Hazards – 3

Weather Related Hazards	EMIS OES	ESRI Weather	METCC	Dingbats	Atmos UCLA	Symbol Source Book
Tropical Storm						
Hurricane						
Typhoon						
Tsunami						

Seismic	EMIS OES	Natural Hazards
Earthquake		
Aftershock		

Warnings	ESRI Weather
Severe Storm Watch Box	
Tornado Watch Box	
Storm Warning	
Hurricane Warning	
Gale Warning	

Weather Related Hazards	EMIS OES	Natural Hazards	NCL/TCD	Symbol Source Book	NPS
Dam Overflowing					
Flood					
Mudflow					
Landslide					
Avalanche					
Volcanic					
Lava or Debris Flow					

Crime and Terrorism

Crime	EMIS OES
Rioting	CA
Access/Crowd Control	⃠
Civil Disturbance	CA
Criminal Activity	CA
Looting	CA

Terrorism	EMIS OES	Military	ER Handbook	Work Site?
Bomb Threat	☼		(symbol)	
Bomb Located	☼	BOMB		
Explosion	☼			(symbol)
Terrorism	TA			
Terrorism Activity	TA			
Hijacking Airplane		⊣		
Hijacking Boat		H		

Miscellaneous Structures - 1

Structures	Symbol Source Book	Symbol Source Book	Symbol Source Book	Cameo	GIS Unit EM	ESRI Forestry	World Bank	NCUITCD	Netherlands	MPS	European Road	Nova Scotia	Jig	US Road
Building														
Bridge														
Dam														
Mobile Home Park														
Nuclear Power Plant														

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Miscellaneous Structures - 2

Structures	Symbol Source Book	ESRI Forestry	Signal Signal Symbol	ATA	D/FW	D.O.T. '74	European Road	KFA	N?S	O ??	Pg	S/TA	TA	TC	WO ??
Parking															

Structures	Symbol Source Book	Symbol Source Book	MapInfo	USGS	Cameo	NCUTCD	ADV	D.O.T. '74	European Road	IATA	ICAO	NRR	O '72	Pg	SP	UIC
Railroad																

Damage and Failure

Collapse	EMIS OES
Building	
Hospital	
Structure	
Dam	
Bridge	
Freeway	
Roadway	

Failure	EMIS OES
Computer System Failure	
Paging System Failure	
Power Failure	
Radio Failure	
Telephone Failure	
Hospital Power Failure	

Misc. Symbols	EMIS OES
Water Loss	
Hospital Water Loss	
Low Water Pressure	
Inoperable Sewage System	
Inoperable Water System	
Train Derailment	

Damage	EMIS OES	Japan: Pictogram	Japan: Pictogram
Building			
Hospital			
Structure			
Dam			
Sewage System			
Water System			
Bridge			
Freeway			
Roadway			

Evacuation Symbols - 1

Evacuation Symbols	ESRI Forestry	ESRI Hazmat	=Milb OES	O'72	Cameo	=Milb Hazmat	MapInfo	Zapt Dingbats	NCJTCD
Handicapped Exit									
Exit Ramp									
Fire Escape									
Use Stairs									
Do not use Elevator-Fire									

Evacuation Symbols	=Milb OES	O'72	Cameo	=Milb Hazmat	MapInfo	Zapt Dingbats	NCJTCD
Evacuation							
Vehicle Evacuation							
Hospital Evacuation							
Evacuation Center							
Evacuation Route							

Evacuation Symbols	Carto-graphic Journal	Carto-graphic Journal	Carto-graphic Journal	Carto-graphic Journal	Carto-graphic Journal	Signet Signal Symbol	Carto-graphic Journal	Carto-graphic Journal	Dingbats	Cameo	GIS Unit EM
Handicapped Access											

Evacuation Symbols	D.O.T. '74	KFA	NPS	O'72	SP	TC	X'67	Symbol Source Book
Handicapped Access								

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Evacuation Symbols - 2

Evacuation Symbols	Symbol Source Book	Signs/Signal Symbol	ESRI Hazmat	ADV	BAA	D/FW	European Road	IATA	ICAO	KFAI
No Entry										

Evacuation Symbols	O'72	Pg	Port	SP	S/TA	TA	IL	AJV	US Road	WO'72	X'67	NAU
No Entry												

Evacuation Symbols	Symbol Source Book	Symbol. Source Book	Carto-graphic Journal	Carto-graphic Journal	KFAI	O 67	O 72	Pg	UIC	X 67
Exit										

Miscellaneous Symbols

Health	FMIS OFS	Closure	EMIS OES
Deceased		Area Closure	
Injuries		Road Closure	

Alarm	Japan Pictogram	Symbol Source Book	Symbol Source Book	LSKI Hazmat	ER Handbook	Pictografic Safety
Alarm						

Utility	Symbol Source Book	Symbol Source Book	Symbol Source Book	Signet Signal Symbol	Nacher cards	Nova Scotia	UIC	X'57	O'72	ER Handbook
Power										

Appendix VI - Proposed Symbols

Proposed Symbols - Emergency Facilities and Other Facilities

Emergency Facilities	Large Scale	Medium Scale	Small Scale
Red Cross			
Medical			
Hospital			
Recovery Center			
Mortuary			
Cold Storage Facility			
Casualty Call Point			
Fatality Call Point			

Emergency Facilities	Large Scale	Medium Scale	Small Scale
Water Distribution			
Food Distribution			
Shelter Sites			
Burn Sites			

Other Facilities	Large Scale	Medium Scale	Small Scale
Church			
School			
Restrooms			
Women's Restrooms			
Men's Restrooms			
Portable Restrooms			
Sewage Treatment Plant			
Water Treatment Plant			

Other Facilities	Large Scale	Medium Scale	Small Scale
Airport			
Trash Sites			
Active Landfill			
Inactive Landfill			
Fuel Storage			
Veterinary			
Landing Zone			
Airbase			
City/Town Hall			
Correctional Facility			

Proposed Symbols - Emergency Services and Other Services

Other Services	Large Scale	Medium Scale	Small Scale
Communication			
Telephone			
Radio			
Television			

Emergency Services	Large Scale	Medium Scale	Small Scale
Army Corps of Engineers			
Army			
Air Force			
Coast Guard			
Mobile Weather Unit			
Traffic Control			
Rescue			
Search and Rescue			
Relief Goods			

Emergency Services	Large Scale	Medium Scale	Small Scale
Housing Human Services			
Unemployment Services			
Emergency Operation Center			
Base Camp			
Disaster Field Office			
Information			
Assembly Area			
Staging Area			

Emergency Services	Large Scale	Medium Scale	Small Scale
Fire Extinguisher			
Fire Hydrant			
Fire Station			
Fire Rescue			
Police Department			
EMT			
Ambulance			
Helipad			
Helipad			

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Proposed Symbols - Crime Terrorism Technology

Technology Hazards	Large Scale	Medium Scale	Small Scale
Hazardous Material			
Radioactive			
Biohazard			
Gas Main Leak			
Toxic Cloud			
Poison			
Flammable			
Flammable Gas			
Flammable Solid			
Non-Flammable Gas			
Combustible			
Caution			

Terrorism	Large Scale	Medium Scale	Small Scale
Bomb Threat			
Bomb Located			
Explosion			
Terrorism Activity			
Hijacking Airplane			
Hijacking Boat			

Crime	Large Scale	Medium Scale	Small Scale
Rioting	R	R	R
	R	R	R
Access/Crowd Control	AC	AC	AC
	AC	AC	AC
Civil Disturbance	CD	CD	CD
	CD	CD	CD
Criminal Activity	CA	CA	CA
	CA	CA	CA
Looting	L	L	L
	L	L	L

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
Proposed Symbols - Natural Hazards

Natural Hazards	Large Scale	Medium Scale	Small Scale
Dam Overflowing			
Food			
Mudflow			
Landslide			
Avalanche			
Volcano			
Lava or Debris Flow			
Earthquake			
Aftershock			

Natural Hazards	Large Scale	Medium Scale	Small Scale
Tornado			
Tropical Storm			
Hurricane			
Typhoon			
Tsunami			
Severe Storm Watch Box			
Tornado Watch Box			
Storm Warning			
Hurricane Warning			
Gale Warning			

Natural Hazards	Large Scale	Medium Scale	Small Scale
Wind Speed and Direction			
Fog			
Rain			
Hail			
Ice Pellets			
Snow			
Blizzard			
Thunderstorm			
Lightning			

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Proposed Symbols - Fire and Evacuation

Evacuation Symbols	Large Scale	Medium Scale	Small Scale
Emergency Exit			
Handicapped Exit			
Fire Escape			
Use Stairs			
No Entry			
Do Not Use Elevator			
Exit Ramp			
Handicapped/ Sensitive Population			

Evacuation Symbols	Large Scale	Medium Scale	Small Scale
Evacuation			
Vehicle Evacuation			
Hospital Evacuation			
Evacuation Center			
Evacuation Route			

Fire Symbols	Large Scale	Medium Scale	Small Scale
Fire			
Hospital Fire			
Fire Origin			
Fire Break			
Spot Fire/Hot Spot			
Fire Spread Prediction			
Uncontrolled Fire Edge			
Smoke			
Burn Area			

Proposed Symbols - Damage and Failure

Failure	Large Scale	Medium Scale	Small Scale
Computer System Failure			
Paging System Failure			
Power Failure			
Radio Failure			
Telephone Failure			
Inoperable Sewer System			
Inoperable Water System			
Water Loss			
Low Water Pressure			
Hospital Power Loss			
Hospital Water Loss			
Train Derailment			

Misc. Collapse	Large Scale	Medium Scale	Small Scale
Building			
Church			
School			
Hospital			
Dam			
Bridge			
Toll Road			
Freeway			
State or US Route			
Divided State or US Route			
Local Road			
Divided Local Road			

Misc. Damage	Large Scale	Medium Scale	Small Scale
Bridge			
Toll Road			
Freeway			
State or US Route			
Divided State or US Route			
Local Road			
Divided Local Road			

Misc. Damage	Large Scale	Medium Scale	Small Scale
Building			
Church			
School			
Hospital			
Dam			
Sewage System			
Water System			

Proposed Symbols - Miscellaneous Structures and Symbols

Misc. Symbols	Large Scale	Medium Scale	Small Scale
Toll Road			
Freeway			
State or US Route			
Divided State or US Route			
Local Road			
Divided Local Road			

Misc. Symbols	Large Scale	Medium Scale	Small Scale
Injuries			
Deceased			
Alarm			
Road Closure			
Area Closure			
Power			
Gas			

Misc. Structures	Large Scale	Medium Scale	Small Scale
Building			
Bridge			
Railroad			
Dam			
Parking			
Mobile Home Park			
Nuclear Power Plant			