Department of Homeland Security
Science and Technology Directorate
Washington, DC

Document #DHS2002C034 **April 11, 2011**

National Alliance for Public Safety GIS Foundation (NAPSG) Symbology Working Group Meeting – March 22-24, 2011

Version 1.3

by

R-Tech Program
Department of Homeland Security, Science and Technology Directorate
Washington, DC

and

Teracore
2325 Dulles Corner Blvd., Suite 500
Herndon, VA 20171

Document History			
Version	Primary Author(s)	Description of Version	Date Completed
1.0	Teracore	Submitted draft	3/31/2011
1.1	Teracore	Revised draft per DHS direction	4/5/2011
1.2	Teracore	Revised draft per DHS direction	4/8/2011
1.3	Teracore	Revised draft per DHS direction	4/11/2011

Table of Contents

1.0 Executive Summary

The National Incident Management Systems (NIMS) seeks to establish a common and scalable approach to incident response operations across the nation. To that end, many of the NIMS principles codify practices to ensure interoperability and compatibility in terms of both technology and business practices. However, the current state of Incident Command System (ICS) geospatial doctrine does not establish a standard methodology for representing information visually, a common practice in state geographic information systems (GIS). As a result, many jurisdictions have established their own representative symbols, resulting in a large number of disparate symbol sets being in use. Without a common symbol set, multi-disciplinary and multi-jurisdictional sharing of geospatial information becomes problematic.

The Department of Homeland Security (DHS) Science and Technology Directorate's (S&T) First Responder Technologies (R-Tech) program has been tasked by the Federal Emergency Management Agency's (FEMA) National Integration Center to undertake a project to develop/identify a best practice symbol set and consensus methodology for the visual display of information in ICS operations. Phase I of the project consisted of performing a due diligence study to determine applicable current and past work in this area to avoid duplication of efforts. This included conducting research and meeting with representatives from relevant stakeholder groups.[1]

In Phase II, R-Tech partnered with the National Alliance for Public Safety GIS Foundation (NAPSG) to leverage their extensive network of practitioners and the symbol set research they have conducted to date. A working group, established by NAPSG to identify symbology issues and a path forward, met in Redmond, Washington on March 22-24, 2011 to begin to identify a process to come to consensus on pre-plan and incident command symbology.

Working group members participated in an exercise to develop pre-plan incident maps with the goal of identifying which symbols should be used and why. Members then reviewed draft lists of potential incident command symbols and functional, or flexible, requirements. From the working group's discussions came the following observations and recommendations:

- All symbology development efforts must start at the pre-incident incident level to determine those static (i.e., unmoving) features (e.g., hydrants, key boxes, ingress/egress points, alarm systems, etc.) that will be critical for operational use during an incident.
- U.S. Department of Transportation (USDOT) placard numbers and symbols should be adopted and used by jurisdictions nationally.[2]
- National Fire Protection Association (NFPA) 704 standard symbology should be adopted and used by jurisdictions nationally.[3]

[1] Phase I was documented in the *National Incident Management System (NIMS) Symbology Due Diligence Summary Report* (January 14, 2011, Document #DHS2002C022).

[2] An example of the USDOT placard numbers and symbols can be found at http://www.fmcsa.dot.gov/facts-research/research-technology/visorcards/yellowcard.pdf .

- The working group came to a consensus on twelve core pre-plan and/or incident command level symbols and/or flexible requirements (see Tables 1 and 3).
- While color is important in many instances, symbols must be kept simple and intuitive. If colors are not readily available when hand-drawing a map, the symbol must be intuitive enough to allow the reader to recognize its meaning regardless of color.
- The standardized DHS symbols adopted by the Federal Geographic Data Committee (FGDC) for a fire station and emergency medical technician (station location, staging area, vehicle location) are not intuitive and should be reviewed for simplification/re-working.
- In keeping with military practice, jurisdictions should use shades of colors for the symbols that are compatible with the color of light likely to be used in the reading environment (e.g., environments lit by the red lights of emergency vehicles).
- Symbology development and other components, including database design/models/schemas and standard map product templates, must be set using a framework, not by simply setting standard symbols for a particular incident.

2.0 Welcome and Introductions

Day one of the working group meeting was held at the Kirkland Fire Department in Kirkland, Washington. Chief Kevin Nalder welcomed the participants to Kirkland and indicated his support of the group's work. Mr. Peter O'Rourke, Executive Director of NAPSG, also thanked the group for participating over the course of three days to begin identifying a methodology and consensus process for pre-incident and incident command symbology. Finally, Mr. Rich Vandame, from the Standards Section of the Standards and Technology Branch in FEMA's National Integration Center thanked the group for its participation.

Mr. Vandame noted that FEMA is attempting to identify a common set of incident command map symbols and is very happy to be working with NAPSG to assist in this effort. He said that anything developed should be simple enough to be hand-drawn. Acknowledging the magnitude of work that goes into developing a core set of nationally recognized symbols, Mr. Vandame informed the group that one of his goals for this meeting is to identify a consensus process that may be replicated that would help identify symbols in the future and set up a process that will ensure the right input is garnered.

Mr. Vandame noted that the meeting will not produce new standards, but rather guidance for national dissemination.

Ms. Rebecca Harned noted that the meeting will attempt to develop common symbology not only within a given discipline, but across disciplines.

Additionally, recognizing a gap in FEMA's work to date and that of the working group, Mr. Vandame informed the group that while the term "pre-planning" is not currently in the NIMS

[3] More information on NFPA 704 standard symbology can be found at http://www.nfpa.org/faq.asp?categoryID=928&cookie%5Ftest=1 .

lexicon, he realized that it is widely used in the field and understood that the group recommended it be adopted by NIMS.

3.0 Map Challenge Exercise

During a teleconference meeting of working group members prior to the March meeting, they were requested to participate in a pre-plan map challenge exercise whereby they used a map template of a Costco, Sam's Club, or Home Depot to populate static symbols necessary for operational use during an incident. These locations were chosen due to their simple building layout schematics, as all are basically square or rectangular in shape and large in area. Working group members developed Web-based maps based on a box store template and pre-populated them with their jurisdiction's critical symbols.

During the March meeting, members presented their maps to the rest of the group, discussing the incident symbols that they used, the rationale for choosing these symbols, and highlighted the various advantages and drawbacks of their local approaches. The information provided during these map challenge presentations provided a catalyst for conversations and discussions regarding the use and selection of symbols.

Working group members acknowledged the need to have maps available for incident command use that were already populated with incident command symbols. They stated that it is critical for incident commanders that these maps show static features (e.g., fire hydrants, ingress/egress points, key boxes, alarm panels, etc.) that will be needed for operational incident command use. Based upon this criticality, members strongly recommended that pre-planning be integrated into NIMS. They noted that during an incident, additional, dynamic features may be added to the map (either electronically or hand-drawn) that are more specific to the incident.

The working group member map challenge presentations are summarized below.[4]

3.1 Exercise #1 – Dave Blankinship (Colorado Springs Fire Department)

Mr. Blankenship displayed a live view of Colorado Springs on a Web-based GIS map. He noted that all pre-incident planning was integrated into operations. For example, automated vehicle location is used in mobile data terminals during an incident. He also displayed on his map colored symbols indicating direction status (green for first responders and red for all other personnel), hydrants, water supply, and service status. Mr. Blankenship noted that the symbols used were intended to be simple for intuitive use within his department: K = key boxes; stars = hydrants; green triangle for attic access; etc. The map also featured a dynamic interaction whereby users could click on a symbol and review and/or input information associated with that symbol.

Mr. Blankenship indicated that when developing a map, Colorado Springs intends to keep things simple and easy to understand – especially on paper maps, which are printed out for use

[4] Not all working group members provided map challenge presentations and not all of the presentations occurred on the first day of the meeting; some occurred on the second and third days of the meeting. Those captured in this report reflect the presentations given.

at the incident scene. He said that there are three things incident commanders need to know from the map: the paper map number (to indicate which version a commander is looking at); "bad things" within the incident scene that the commander should be aware of; and general guidance on the incident area.

He noted that while his department uses easy-to-read symbols that effectively transcend pre-planning to operations, the symbols are outdated. He also noted that incident status boards and organization charts may be a basis for map legends. In responding to a question on whether or not the Colorado Springs Fire Department has run into issues with responders looking only at maps and not what's in front of them, Mr. Blankenship noted that ninety percent of the time, it has not been an issue, as team members see the specific symbols associated with incidents in front of them on site, because a large portion of the maps they are looking at have been pre-planned for operational use. He noted that this pre-planning is critical to successfully mitigating an incident.

3.2 Exercise #2 – Peter Hanna (Baltimore City Fire Department)

Mr. Hanna displayed a map of a Home Depot within Baltimore's city limits using Geo-PDF images. He said that Geo-PDF is a preferable format to use because you can easily turn various data layers on and off, which allows users to see only what they need to see. He "pre-planned" his floor plan by noting two differently colored fire hydrant symbols on the map. These differently colored hydrants represented city-owned versus privately owned hydrants. Additionally, the floor plan was sectioned off using different colors to reflect fire load dangers (e.g., the lumber section was bright red; the section containing fertilizer and other hazardous materials was another color; etc). Utility shutoffs were also represented on the map. Mr. Hanna noted that one of the problems with symbology is the use of coloring. Many printed maps and some photography is only available in black and white, which makes identification of symbols requiring colors difficult. He suggested a potential solution might be a color scale for black and white in addition to one for color.

Mr. Hanna also noted that there may be a benefit to scaling symbols differently on the map to reflect importance. In response to a question regarding what looks better in the field, aerial photography or building footprints, various working group members indicated that it depends on the currency of the imagery, though it would be useful to have both options. They also noted that should be a balance between a simple footprint view versus complex imagery and that an ortho view is scale-dependant. Finally, members noted that using "haloing" around symbols might be a good idea, as it will aid in identifying features more effectively.

3.3 Exercise #3 – Peter DiTuri (Seattle Fire and Rescue)

Mr. DiTuri noted that Seattle Fire and Rescue creates very simple maps using Microsoft Visio, along with adding very simple symbols. In developing his pre-plan map, Mr. DiTuri consulted with operators and "line guys" within his department and they indicated that they only needed to know basic information on a pre-plan map: railroad tracks; ingress/egress points; hydrants; hazards; and electrical features.

Mr. DiTuri noted that there were similarities between the symbols Seattle Fire Department uses and the DHS symbol set developed by the FGDC, along with key differences. Many of these

differences occurred when using images as opposed to simple shapes and colors. In addition, the Seattle Fire Department has unique symbols. According to Mr. DiTuri, this use of unique symbols emphasizes the need to keep symbols flexible.

In developing his pre-plan map, Mr. DiTuri described three lessons learned:

- Keep it simple;
- Some features are able to be pre-planned, while others can only be done in real-time during an incident; and
- Standardization is possible on core elements, but there needs to be flexibility on symbols to allow jurisdictions to utilize them to meet their specific needs.

3.4 Exercise #4 – Dustin Morrow (Tualatin Valley Fire and Rescue)

Mr. Morrow noted that it is critical to keep the connection between operations and pre-planning when developing a map. It is also important to have a map that is printable using a computer-assisted database (CAD) or a mobile data terminal. The opinion of Tualatin Valley Fire and Rescue (TVFR) is that "less is more." Given that there are so many variables which can be displayed on maps, from very simple to very complex, TVFR does not build out incident maps in advance.

In addition, Mr. Morrow noted that one of the problems with symbology is that there are too many color dynamics. He also stated that all maps and pre-plan activities should be considered as supplemental tools – they should not replace key personnel (e.g., chiefs and captains) who should know the subject matter and incident areas. Finally, Mr. Morrow stated that pre-plan numbers need to be incorporated into map numbers so as to more effectively provide version control and status updates.

3.5 Exercise #5 – Sandi Cone (City of Laurel, MD)

Ms. Cone noted that she is not a first responder, but a city government employee charged with working on GIS and mapping information to assist Laurel, Maryland's first responder community. Laurel developed the Tandem Emergency Response Platform (TERP) as its primary mapping application and uses a software program called SEQUEL, in coordination with Google Street View, to develop symbology within a CAD.

TERP displays the map, and the SEQUEL software provides specific information regarding a symbol and what it means by a user clicking on the symbol. It also reports by exception, which allows for an un-crowded map and for the user to view only what he or she wants to see. [5] Currently, most of Laurel's work in this area is for law enforcement use, with some fire service input.

Two issues that Ms. Cone identified are mapping features for city-owned versus non-city-owned symbols (e.g., hydrants) as well as terminology (e.g., translating terms that law enforcement uses into those recognized by fire, and vice versa).

[5] Reporting by exception is a technical function on a Web-based map that allows a user to select or de-select data layers to be viewed.

3.6 Exercise #6 – Len Waterman (Redmond, OR)

Mr. Waterman began his presentation by stating that the only way an incident can be successfully handled is with a pre-planned map. Using the Wireless Information System for Emergency Responders (WISER) for Windows application, Mr. Waterman displayed a map with symbols that were hyperlinked to provide additional information as needed.

He noted that the challenge Redmond has is going from computer-based maps to paper maps and maintaining sufficient viewing capability. Additionally, Mr. Waterman noted that when he consulted operators on what they would like to see on a map, they responded that they needed more incident-command-based symbols and uniformity. Two areas in which Mr. Waterman identified gaps were symbols for water rescue and high/low angle rescue operations.

3.7 Exercise #7 – Captain Steven Pollackov (Fire Department of New York)

Captain Pollackov noted that FDNY primarily uses the incident command structure when populating maps either in pre-planning or during an incident. He also stated that there should be some type of standardization when it comes to using symbols and that some of the symbols that FDNY uses were pulled from the set developed by the National Wildfire Coordinating Group (NWCG) (e.g., incident command post, helipad, base camp). Additionally, FDNY is working to develop pre-incident guidelines (e.g., symbols for hydrants, subway lines, utility lines) to create maps for operational use.

New York City is unique, in that it has unusual variables to consider when viewing an area – not the least of which is that a large number of its buildings are skyscrapers with multiple levels to consider. FDNY is working with a company that has developed a software program that allows a user to view different levels of a building and plan around that level's footprint. Another challenge is the addresses of buildings, since many buildings have vanity addresses as opposed to street addresses. To resolve this problem, FDNY has taken to using Building Identification Numbers instead. Another challenge FDNY has encountered in mapping is excessive symbol density. Captain Pollackov recommended that a core set of incident command symbols be developed and used nationally.

3.8 Exercise #9 – Chris Rogers (Kirkland Fire Department) and Brent Sytsma (Woodinville Fire and Rescue)

Mr. Rogers and Mr. Sytsma are from neighboring jurisdictions and worked together to develop a pre-plan map. When developing the map, they considered several factors:

- The symbols need to be simple and easy to understand; and
- The front side of the building (i.e., the main ingress/egress point) needs to be identified and labeled.

In their design, they used the following convention:

- All symbols associated with water are red;
- All symbols associated with access points are green;

- All symbols associated with control panels are yellow; and
- All symbols associated with utilities are orange.

In developing their pre-plan map, Mr. Rogers and Mr. Sytsma used symbols from various sets (e.g., NWCG, DHS, the military) to see how crowded it would be and determine legibility. This resulted in a recommendation from the other members to develop an overall framework for symbology and other components that would include database design/models/schemas and standard map product templates, rather than a specific symbology itself. Meeting attendees agreed that it is imperative that guidance on database design be developed as well, to ensure the appropriate database schemas support the symbol sets. Without a technically compatible database schema, the symbol set could easily be rendered useless.

The discussions regarding databases led to discussions regarding development of standard map product templates. The attendees believe that standard map template development is an equally critical tool in operationalizing GIS and, more specifically, the symbol sets. By developing and providing standard map product templates, FEMA and NAPSG will provide local GIS and public safety officials with guidance on how to build the specific maps for different incidents. For example, an emergency operations center situational awareness map will not contain all of the same data and information as a field-based search-and-rescue map.

Standard map product templates will also provide users with a basis for determining which information/data they need to include on different maps for different purposes. In turn, the database and its symbology also need to be developed and managed to support the production of those standard map products.

The coupling of these three components (database design/models/schema; symbol set and flexible requirements development; and standard map product templates) is essential in developing the broader framework for operationalizing GIS.[6]

Mr. Rogers stated that in order to successfully mitigate incidents, all egos must be put aside and personnel, jurisdictions, and disciplines must work together.

3.9 Exercise #9 – Mike Price (Mt. Vernon) and Captain Brian Green (Surrey, British Columbia)

Mr. Price and Captain Green recommended that symbology be kept as simple as possible. They displayed a CAD drawing of a map with dynamic labeling (i.e., users can scroll over a symbol and a "pop-up" with more information about that particular symbol and the related incident will appear) and symbol placement, using Maplex for ArcGIS software.

3.10 Exercise #10 – Tricia Toomey (San Diego State University, Homeland Security Regional Technology Center)

Ms. Toomey noted that SDSU has used Urban Area Security Initiative (UASI) grants to consolidate mapping resources in the Southern California region. It required five years for a

[6] Information provided by NAPSG.

regional working group to develop a common regional symbology, but now all pre-plans and incident maps are similar and a common symbol set is being used.

A current challenge noted by Ms. Toomey is that the region is working to transfer all data into digital formats. Some departments in the region are already using digital formats, while others still primarily use paper resources. Ms. Toomey indicated that while the region is unlikely to adopt any new symbols for incident command use, the flexible requirements the NAPSG working group has agreed to are similar and common to those which her region has already adopted.

4.0 Symbol Harmonization and Consensus Exercise

Prior to the working group meeting, NAPSG and R-Tech compiled symbols from various symbols sets, such as the NWCG and FGDC sets, as well as from a list of over 600 symbols that NAPSG collected from agencies across the Nation. Adopting a similar approach to that of the DHS Geospatial Management Office (GMO) in its effort to harmonize symbols associated with the Homeland Security Information Program, the team reviewed the symbols and attempted to categorize them using a "green, yellow, red" system. Green were the symbols widely used and thought to be easy to obtain consensus agreement; yellow were the symbols that most agencies used, but some other agencies used other symbols for that item; and red are those symbols which are nowhere near consensus due to a variety of issues.

Given the limited amount of time for the working group meeting, NAPSG and R-Tech agreed to only focus on those symbols they identified as green. This process resulted in two lists to assist in more effectively developing a harmonization and consensus process to identify common incident command level symbology. These lists were reviewed with the working group members, who provided recommendations on what should and should not be used as a common symbol across the United States. The process used to make recommendations was majority vote by Robert's Rules of Order in a plenary session with all working group members present.

4.1 Green Symbols List

The green symbols list was grouped by category and feature status, and is attached as Appendix D. Categories included things such as "hospital," "fire station," "EMT station," "incident command post," etc. Feature status included fixed operation locations (e.g., hospitals, fire stations), features with a static location added to a map during an incident (e.g., incident command post, helipad), features with a dynamic location during an incident (e.g., escape routes, hazard lines, fire direction), and location features that are static during an incident (e.g., water tanks, key boxes, utility valves).

Symbols were presented to the working group individually for consideration for recommendation for common use. The working group members discussed the use of the symbol, provided input regarding potential advantages and disadvantages for the use of the symbol, and voted on whether or not that symbol should move forward as the part of the recommended core list for incident command use.

Immediately, all working group members recommended that agencies across the Nation should adopt and use the U.S. DOT Placard Numbers symbol set and the NFPA 704 symbol set, which include many of the symbols found on the list presented. Additionally, working group members agreed that the symbols given in Table 1 should be recommended as core incident command symbols.

Table 1: Core Incident Command Symbols

Category	Symbol
Operations – Hospital	
Command – Incident Command Post	

Recognizing that many of the symbols have colors associated with them, NAPSG and R-Tech asked the working group members if colors were truly important when viewing symbols on a map. Working group members agreed that colors help both pre-planning and incident command, though the symbols need to be decipherable with or without color. For example, if a symbol needs to be hand-drawn or created in some other way during field operations, color schematics or resources may not be readily available.

With regard to the table above, working group members recommended that the two-tone square should be adopted for an incident command post. If possible, users should represent the symbol in blue. However, if color is not an option, the symbol can be represented in black and white, as shown:

Working group members also recommended flexibility to label the symbols as they see fit for jurisdictional use. For example, if they adopt the core, two-tone square as the command post symbol, if needed, they could write “ICP” in one of the colored sections or “incident command” outside the square for easier reference. For example:

Additionally, working group members recommended that in keeping with military practice, jurisdictions should use shades of colors for the symbols that are compatible with the color of light likely to be used in the reading environment (e.g., environments lit by the red lights of emergency vehicles). As the working group continued to analyze the green list, members agreed that many of the FGDC symbols adopted by DHS are neither readable nor intuitive for use in mapping operations. For example, working group members recommended the following symbols be re-examined along with all other DHS symbols currently in use:

Table 2: Symbols Recommended by Working Group Members to be Re-Examined

Category	Symbol
Operations – Fire Station	
Command – EMT Station	

NAPSG and R-Tech asked the working group members whether having the option to hand-draw a symbol is critical in determining which sets should be adopted for core use. Members had mixed opinions on whether or not the ability to hand-draw a symbol should be a requirement for inclusion on the recommended list. Some members argued that it should not be a requirement, as many jurisdictions can now create, update, and print out maps in the field through the use of mobile data terminals. Others argued that hand-drawing is still widely used in the field, especially in rural areas where in-field technology is not readily available. No consensus was reached on this criterion, though members agreed that all of the symbols recommended during the course of the meeting do meet that criterion.

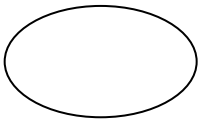
4.2 Flexible Requirements List

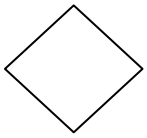
Working group members agreed to table further discussion on the green list in support of reviewing the flexible requirements list developed by NAPSG (attached as Appendix E). NAPSG defined the framework for this list as core categories or groups with common features for symbols in each category. Once the core "wrappers" for symbols are set, specific agencies and jurisdictions may customize each symbol to fit their needs.

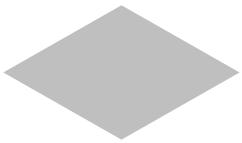
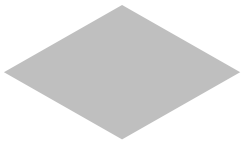
The following table shows those symbols NAPSG proposed for consensus, the symbols adopted by a consensus of the working group members, and any observations or comments.

Table 3: Proposed and Recommended Symbols

Category/Group	Symbol (Wrapper) Proposed	Symbol (Wrapper) Recommended	Comments/Observations

Category/Group	Symbol (Wrapper) Proposed	Symbol (Wrapper) Recommended	Comments/Observations
Units			A horizontal circle, or ellipse, was recommended by the group because a circle conflicts with the universal pre-fire symbol for water usage. Additionally, an ellipse is thought to be more encompassing of a wrapper around various units and provides more room for text or other symbols which need to be inserted. The unit symbol should ONLY be black and white and, when applicable, should default to existing incident command symbols.
Task Groups			Task groups will be a rectangle with text inserted in the wrapper for jurisdictional use. Some agencies currently use a rectangle with either letters or numbers to represent sides of buildings. Members recommended that in the future, agencies simply label the sides of buildings with no wrapper (i.e., simply A, B, C, D). For easier reference, agencies can also use quotation marks or “haloing” around the letter.

Category/Group	Symbol (Wrapper) Proposed	Symbol (Wrapper) Recommended	Comments/Observations
Hazards (to encompass all types of hazards)			All hazards should be represented by a **vertical** diamond as opposed to a triangle. Working group members recommended this because triangles are used for other symbols, resulting in confusion, and a vertical diamond is already widely in use by many agencies to represent hazards. Also, it is compatible with currently used software.
Access Points			To be represented by a green triangle. Working group members recommended flexibility on either having a black outline or not. Having the outline would accommodate hand-drawing.
Assessment Features			Working group members recommended a red triangle that users can: change the tone of the red color for ease in viewing; add interior text in any color needed for ease in viewing; and add a black border if desired.
Utility Shutoff			Working group members recommended text labeling for the symbol based on utility type as well as the flexibility options cited for assessment features. When labeling, use NFPA label standards, but limit labels to core water, gas, and shut-off text. If relevant text doesn't already exist, agencies should have the flexibility to create their own.

Category/Group	Symbol (Wrapper) Proposed	Symbol (Wrapper) Recommended	Comments/Observations
Detection/ Extinguishing Equipment			Working group members recommended a grey, horizontal diamond for this category. The grey color is important because the color is semi-passive, but it still represents an indicator. Members recommended being flexible on whether or not a border should be applied.
Ventilation			Working group members recommended a purple triangle with the same flexibility options cited for the other triangular symbols in this table.
Water Flow Devices			Working group members recommended a red circle, as this is consistent with NFPA standards. Flexibility is recommended on addition of a border and any labeling text.
Equipment Rooms/ Location of Features			Working group members recommended a grey square. Flexibility is recommended on border and any labeling text.

Working group members agreed that many, if not all, of these flexible requirement symbols would leverage the color when they are pre-incident, but most likely would have the basic black and white wrapper when added to a map during an incident if color is not readily available. Additionally, where standards are already set (e.g., in the case of the hazard diamond), the symbol shapes must stay consistent with those standards. Finally, all labeling must be clear, use letters or numbers, and have flexible fonts, though sans serif fonts will likely be preferred.

5.0 Overall Recommendations and Observations

The NAPSG working group members provided the following recommendations:

- All symbology development efforts must start at the pre-incident incident level to determine those static (i.e., unmoving) features (e.g., hydrants, key boxes, ingress/egress points, alarm systems, etc.) that will be critical for operational use during an incident.

- USDOT placard numbers and symbols should be adopted and used by jurisdictions nationally.[7]
- NFPA 704 standard symbology should be adopted and used by jurisdictions nationally.[8]
- The working group came to consensus on twelve core pre-plan and/or incident command level symbols and/or flexible requirements (see Tables 1 and 3).
- While color is important in many instances, symbols must be kept simple and intuitive. If colors are not readily available when hand-drawing a map, the symbol must be intuitive enough to allow the reader to recognize its meaning regardless of color.
- The standardized DHS symbols adopted by the FGDC for a fire station and emergency medical technician (station location, staging area, vehicle location) are not intuitive and should be reviewed for simplification/re-working.
- In keeping with military practice, jurisdictions should utilize shades of colors for the symbols that are compatible with the color of light likely to be used in the reading environment (e.g., environments lit by the red lights of emergency vehicles).
- Symbology development and other components must be set using a framework (e.g., three-phase map system, harmonization, consensus), not by simply setting standard symbols for a particular incident.
- The creation of a symbols map is a three-phase approach that begins with a core area map. The phases are:
  - Pre-plan;
  - Incident; and
  - Post-incident.
- Setting a framework for symbology and its components, including database design/models/schemas and standard map product templates, rather than symbols themselves, is critical. This framework consists of keeping symbology simple and focusing incident command symbology on a single emergency, not the whole integrated problem. Incident command should take a modular approach to problems and focus individual teams in separate areas. These components result in the path to operationalize GIS.

6.0 Action Items and Next Steps

As the working group meeting adjourned, members remained enthusiastic and prepared to continue the important work that was achieved over the course of the three days. User feedback is included in Appendix F. As of March 28, 2011, Redmond, Oregon committed to begin implementing, as a result of their own initiation and interest, the draft functional

[7] An example of which can be found at http://www.fmcsa.dot.gov/facts-research/research-technology/visorcards/yellowcard.pdf.

[8] More information can be found at http://www.nfpa.org/faq.asp?categoryID=928&cookie%5Ftest=1.

requirements for the symbology across their region and across disciplines (fire, police, and emergency management). Other agencies in attendance committed to begin testing the functional requirements within their agencies and begin implementing their use in the near term.

Members recommended the following action items and next steps for NAPSG and DHS:

- Develop a map exercise or template to "test" the twelve core symbols agreed to during the meeting;
- Find an easier way to convert symbols into files that may be more effectively used in Web-mapping;
- All of the symbols discussed in the meeting were point symbols, and thus NAPSG should hold working group meetings to discuss line symbols and polygons;
- Approach the FGDC, NWCG, and NFPA to incorporate the recommended core symbols into their symbol sets;
- Have FEMA brief the IAB on the results of the meeting as well as the working group in charge of the next NIMS revision;[9]
- Draft a press release to post to pertinent DHS websites such as the Responder Knowledge Base (RKB) or www.FirstResponder.gov regarding the working group meeting;[10]
- Conduct a follow-up working group call to continue the next steps discussion; and
- Post symbol demonstrations and testing on the NAPSG Website and YouTube site.

7.0 Socialization Plan for Core Incident Command Symbology

Apart from the working group meeting, R-Tech began development of a socialization plan for core incident command symbology. The results of that development are given below.

As DHS continues the effort of drafting a core incident command symbols list, it should socialize any completed symbol products through the DHS GMO. R-Tech recommends that any socialization plan include continued engagement with the DHS federal symbology working group that was informally established to coordinate efforts in this area, and NAPSG through their symbology working group, Regional Leadership Teams (RLT)[11] and Regional Public Safety GIS Workshops[12] to leverage its regional committees and subject matter experts already in

[9] Every two years, FEMA reviews the NIMS guidelines and revises them as necessary. The guidelines can be found at http://www.fema.gov/emergency/nims/. The current NIMS revision is underway.

[10] The RKB may be found at https://www.rkb.us/

[11] More information on NAPSG's regional leadership teams may be found at http://www.napsgfoundation.org/about/regional-leadership-teams.

[12] More information on NAPSG's annual workshops may be found at http://www.napsgfoundation.org/events/regional-workshops.

place. These entities have reach and influence far across the first responder community and can provide critical support in communicating with pertinent stakeholders in adopting a common symbol set.

DHS plans to post information at www.FirstResponder.gov and on R-Tech's First Responder Communities of Practice, where a symbology community has already been established. Aside from posting information to static and dynamic Websites, DHS could give presentations, hold working group meetings and conference calls, and conduct other stakeholder engagement activities as necessary to achieve the desired national socialization results. Additionally, working with organizations such as the Interagency Board for Equipment Standardization and Interoperability (IAB), as well as the national first responder associations and related stakeholder groups (e.g., the International Association of Fire Chiefs, the International Association of Chiefs of Police, the National Association of State Emergency Medical Services Officials, etc.), will provide added outreach, socialization, and further vetting among critical end users.

Finally, FEMA could post information on the symbology effort on the RKB and work through its regional offices to promote a core symbols list on a regional basis, which will better facilitate organization and outreach.

Appendix A: **Agenda**

NAPSG Foundation with DHS & FEMA
Pre-Planning & Symbology Working Group Meeting
March 22-24, 2011

Tuesday, March 22

- ✓ **Location:** Kirkland Fire Department **-** 9930 124 Ave NE, Kirkland

- ✓ **Ground Transportation to Meeting:** For participants needing ground transportation to Kirkland Fire Department, there will be 2 vehicles that will shuttle participants from the Hilton Bellevue to the Kirkland Fire Department. Peter O'Rourke and Chris Rogers will be able to take some participants and others will share taxis. **Participants needing ground transportation should meet in the **hotel lobby at 1:15pm** on March 22 to share taxis.**

2:00-2:20pm – Welcome & Introductions

- **Welcome** – *Chris Rogers & Fire Chief of the Kirkland Fire Department*
- **NAPSG Introduction** – *Peter O'Rourke, Executive Director, NAPSG Foundation*
- **DHS & FEMA Introduction** – *Rich Vandame & Bill Deso*

2:20-4:10pm - Post Map Challenge Analysis

- **Overview of Map Challenge** - *Facilitator: Chris Rogers*
- **Individual Pre-Plan Map Presentations** – 15 min each person with Q&A/Discussion
  - Describe your map – pre-plan and/or incident map
  - Describe the workflow for how you produced the map
  - Describe the symbols you used and why – which standards or custom
  - Discuss your lessons learned in producing the map – 3 positive, 3 improvement needs

10 Minute Break

4:20-5:45pm – Symbology Plenary

- 4:20-4:30 - Overview Presentation on Symbol Harmonization Strategy & Methods – *Presenters: Chris Rogers & Rebecca Harned*
- 4:30-5:45 - Whole Group Analysis & Consensus Exercise for "Incident Symbols in Green Category" – *Facilitators: Steve Precker & Chris Rogers*

15 Minute Break – Snacks Provided

6:00-6:30pm – Day 1 Wrap-Up & Review of Agenda for Day 2

- Discussion on how symbol harmonization relates to map challenge, and mapping workflow to support pre-planning & incident map production – *Steve Precker & Chris Rogers*

Evening – Microsoft WWPSS

- 6:00-8:00pm – Early Registration & Partner Reception (Microsoft Conference Center, Building 33)
- Participants that would like to register early and attend the partner reception, transportation will be provided from Kirkland Fire Department to the Microsoft Conference Center at 6:30pm. Microsoft shuttle will be provided for return to the Hilton Bellevue.

Wednesday, March 23

- ✓ **Location –** Microsoft Conference Center – 16070 NE 36th Way Building 33 Redmond, WA 98052

- ✓ **Ground Transportation** – All participants should plan to arrive at the Microsoft Conference Center by 8:00am for conference registration and breakfast. Microsoft provides shuttle service between the hotels and the conference center.

- ✓ **Morning -** Microsoft Worldwide Public Safety Symposium
  8:00-8:30am – Continental Breakfast Provided
  8:30-8:40am – Microsoft Welcome & Overview
  8:40-10:40am – Domestic Challenges Facing Public Safety
  10:40-11:20am – Keynote – International Collaboration in Public Safety
  11:20-12:00pm – Keynote – Worldwide ICT & Cloud Trends in Public Safety
  12:00-1:00pm – Hosted Lunch Breakout Sessions by Disciplines

- ✓ **Afternoon –** Pre-Planning & Symbology Working Group Meeting Continues
  - **Lassen Room**

1:00-1:10pm – Overview of Second Day *(Lassen Room)*

- Reflections from Day 1 – *Facilitator: Chris Rogers*
- Assign Breakout Groups – *Facilitator: Steve Precker*

1:10-2:15pm – Breakout Groups Review & Analyze Functional Requirements for Flexible Symbols

Each group will conduct an analysis of the draft functional requirements & will provide feedback to the questions. *Note* – this is a group analysis, not a consensus building exercise

- Can the functional requirements for the "flexible symbols" be easily applied to pre-plan & incident mapping?
- Are there any technical or other issues with the functional requirements?
- What proposed changes and/or recommendations does your group have to help improve the functional requirements?
- Are there any gaps in the functional requirements? If so, what are they?

2:15-2:45pm – Report Outs from Groups – *Facilitators: Steve Precker & Chris Rogers*

- Each group chooses one volunteer to give a 15 minute report

2:45-3:30pm – Symbology Plenary Discussion – *Facilitators: Chris Rogers & Rebecca*

- What is missing from this phase 1 of the ICS Symbol Harmonization effort?
- Did you identify any gaps in the "Green Symbol Category" from Day 1 or in the Functional Requirements process?

3:30-3:40pm – Wrap-Up & Debrief –*Steve Precker, Chris Rogers & Rich Vandame*

- Chart the Future Road Map for Incident-Level Symbology, GIS Pre-Planning, and Incident Mapping

✓ **Late Afternoon/Evening –** Conference sessions of the Microsoft WWPSS
3:40-4:20pm – Keynote Panel Discussion – Transformational Strategies for Public Safety
4:20-5:00pm – Closing Keynote
6:30-9:00pm - Reception & Dinner (*Newcastle Golf Club - Transportation Provided by Microsoft)*

Thursday, March 24

✓ **Location –** Microsoft Conference Center – 16070 NE 36th Way Building 33 Redmond, WA 98052

✓ **Ground Transportation** – All participants should plan to arrive at the Microsoft Conference Center by 8:00am for conference registration and breakfast. Microsoft provides shuttle service between the hotels and the conference center.

✓ **Morning -** Conference sessions of the Microsoft WWPSS
8:00-8:30am – Continental Breakfast Provided
8:30-9:30am – Keynote Session on Cyber Security and Digital Forensics

9:30-9:45am - Overview of Day 2 Meeting – *(Lassen Room) - Facilitator: Chris Rogers*

- Reflections from Days 1 & 2

9:45-10:10am – Presentation on the Synthesis of Results from Days 1 &2

- Share out draft symbol lists harmonized & agreed-up by group – *Facilitator: Steve & Chris*
- Provide final results of the Functional Requirements for symbols in the Flexible Category

10:10-11:20am – Discussion of Draft Road Map for NIMS/ICS Symbology
- Co-Facilitators – Chris & Steve

✓ **Late Morning/Afternoon -** Conference sessions of the Microsoft WWPSS
10:20-10:40am – Morning Networking Break (Coffee & Snacks)
10:40-11:20am – Breakout Sessions 1 – Incident Management; Situational Awareness; Cross-Agency Collaboration
11:25-12:05pm – Breakout Sessions 2 - Major Event Management; Fusion Centers & Link Analysis; Unified Communications
12:05-1:05 – Lunch

1:00-1:15 – Debrief of AM Meetings & Sessions – *(Lassen Room)* –
Facilitator: Chris Rogers

1:15-2:00pm – Development of Group Recommendations
- Co-Facilitators – Steve Precker & Chris/Rebecca

2:00-2:15pm – Final Wrap-Up & Closing – *Chris, Steve, & Rich*

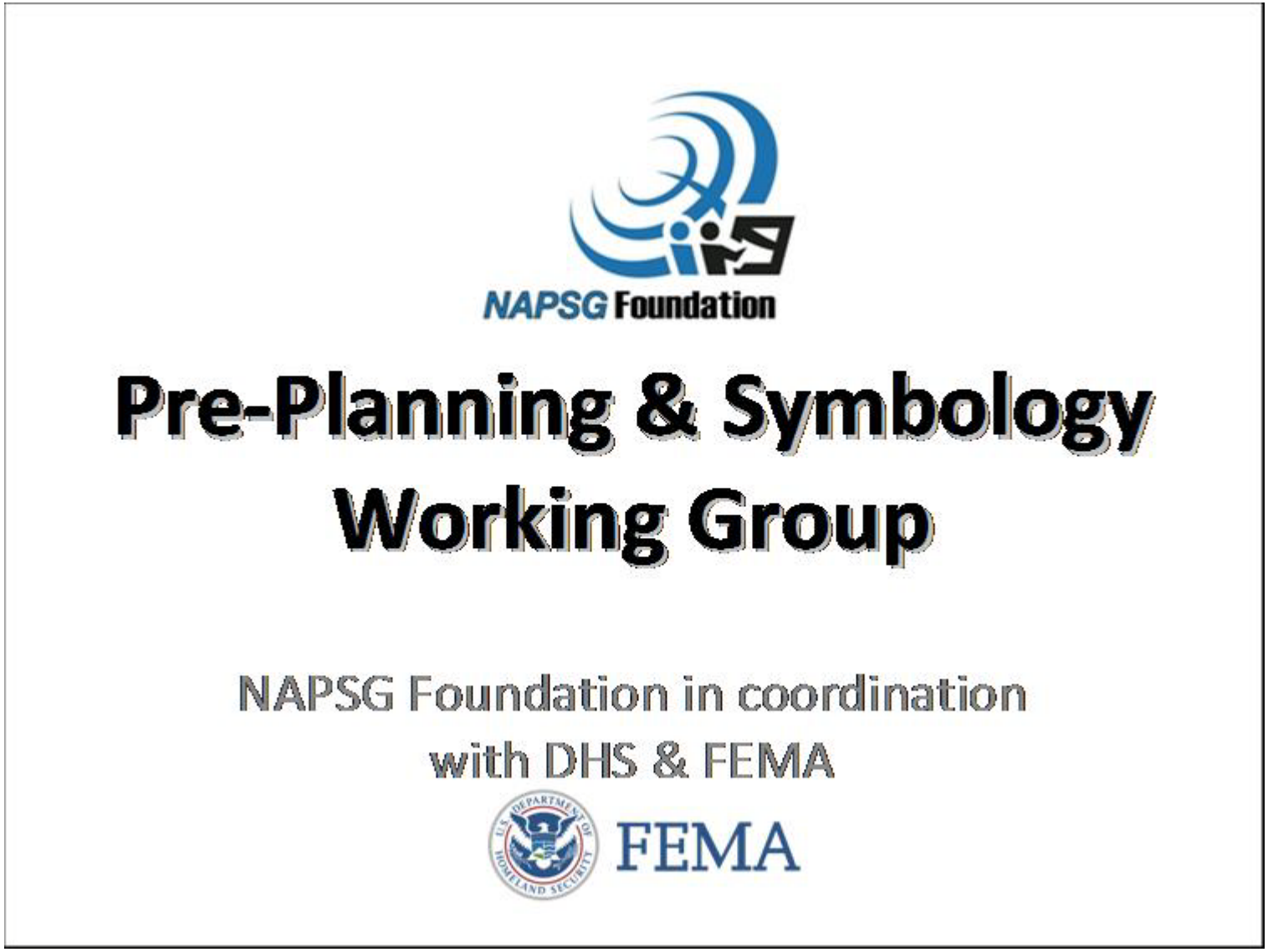
- Possible closing session with Redmond Fire & Police doing ICS Mapping in Real-Time

✓ **Afternoon –** Conference sessions of the Microsoft WWPSS
2:20-3:00pm – Keynote Panel
3:00-3:40pm – National Crisis Management
3:40-4:30pm – The Power of the Cloud in Disaster Response
4:30pm – Closing Remarks

Appendix B: **Participant List**

- David Blankenship, Senior GIS Analyst, Colorado Springs Fire Department
- Sandi Cone, GIS Specialist, City of Laurel (MD)
- Bill Deso, Program Manager, DHS S&T, First Responder Division, First Responder Technologies Program
- Peter DiTuri, Lead GIS Analyst, Seattle Fire Department
- Margo English, DHS R-Tech Support Staff, Teracore
- Captain Brian Green, Surrey Fire Service, British Columbia (Canada)
- Peter Hanna, Geographic Information Specialist, Baltimore City Fire Department
- Rebecca Harned, Program Director, NAPSG
- Dustin Morrow, Tualatin Valley Fire and Rescue (OR)
- Rand Napoli, former Florida State Fire Marshall and Vice Chair, NAPSG Foundation
- Peter O'Rourke, Executive Director, NAPSG
- Captain Steve Pollackov, Commanding Officer, Fire Department of New York, GIS Unit
- Jim Potteiger, Assistant to the Chief, Baltimore City Fire Department
- Steve Precker, DHS R-Tech Support Staff, Teracore
- Mike Price, GIS Specialist, Mount Vernon (WA)
- Chris Rogers, Firefighter, Kirkland (WA) Fire Department
- Brent Sytsma, Firefighter, Woodinville (WA) Fire and Rescue
- Tricia Toomey, GIS Specialist, Homeland Security Regional Technology Center, San Diego State University Research Foundation
- Rich Vandame, FEMA, National Integration Center, Standards and Technology Branch, Standards Division
- Len Waterman, Redmond (OR)
- Scott Wedemeyer, Firefighter, Woodinville (WA) Fire and Rescue
- Ron Wieland, Seattle-Tacoma Fire Department

Appendix C: **Welcome and Introduction Slides**



Welcome

- **Welcome** – *Chris Rogers & Fire Chief of the Kirkland Fire Department*
- **NAPSG Introduction** – *Peter O'Rourke, Executive Director, NAPSG Foundation*
- **DHS & FEMA Introduction** – *Rich Vandame & Bill Deso*
- *Everyone*

Guiding Principles

- Emphasis on providing guidance
  - *Not* creating new standards
- Bring everybody's ideas together
  - It's better to share a idea or contribution instead of discarding it
- Today (and all meetings March 22-24) are just the beginning
  - This is an ongoing effort that will continue

Where We Are


Canada
Saskatoon
Calgary
Regina
Winnipeg
Moosonee
ONTARIO
QUEBEC
Vancouver
Victoria
Seattle
WASHINGTON
Great Falls
MONTANA
NORTH DAKOTA
Fargo
MINNESOTA
Portland
Boise City
IDAHO
OREGON
SOUTH DAKOTA
Sioux Falls
Minneapolis
WISCONSIN
MICHIGAN
Quebec
Ottawa
Montreal
MAINE
Toronto
NEW YORK
Portland
Boston
Milwaukee
Detroit
Buffalo
WYOMING
NEBRASKA
IOWA
Des Moines
Chicago
Cleveland
Cheyenne
Omaha
PENNSYLVANIA
Salt Lake City
Denver
United States
ILLINOIS
OHIO
New York
Philadelphia
Baltimore
NEVADA
UTAH
COLORADO
Kansas City
Springfield
Indianapolis
Columbus
INDIANA
KANSAS
St Louis
Louisville
Charleston
San Francisco
San Jose
Wichita
MISSOURI
KENTUCKY
VIRGINIA
Virginia Beach
Las Vegas
CALIFORNIA
Oklahoma City
OKLAHOMA
TENNESSEE
Little Rock
Memphis
Charlotte
NORTH CAROLINA
Albuquerque
NEW MEXICO
ARIZONA
Los Angeles
Phoenix
ARKANSAS
Birmingham
Atlanta
Columbia
SOUTH CAROLINA
San Diego
El Paso
Dallas
Jackson
ALABAMA
GEORGIA
TEXAS
LOUISIANA
New Orleans
Jacksonville
San Antonio
Houston
FLORIDA
Hermosillo
Chihuahua
Gulf of Mexico
Miami
Nassau
Torreon
Monterrey
Mexico
Bahamas
Havana
Cuba
Guadalajara
Mexico City
Toluca
Merida
Cancun
Haiti
Jamaica

Rules

- No acronyms unless it has a vowel
  - Good: FEMA, NAPSG, ESRI
  - Bad: KFD, SFD, NWCG
- Be flexible
- Always link it back to the big picture
  - When we get into the weeds, think big
  - Make sure that we build upon others hard work

Map Challenge

- Tool to generate thoughts on maps
- Run like it's a Post-Incident Analysis
  - Describe your map – pre-plan and/or incident map
  - Describe the workflow for how you produced the map
  - Describe the symbols you used and why – which standards or custom symbols used
  - Discuss your lessons learned in producing the map – 3 positive, 3 improvement needs

Bringing it all together

- Thoughts
- Technical Considerations
- Questions
- 10 minute break

Incident-Level Symbology

Overview - Symbology Harmonization

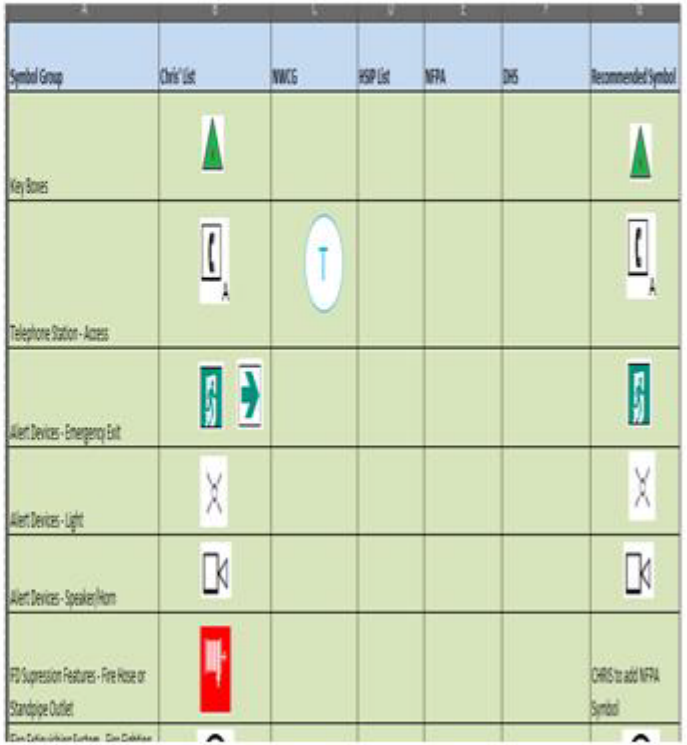
- During mutual aid response, pre-plans & incident maps are shared for situational awareness
  - All scales and types of incidents
- If every dept uses different symbols, responders won't be able to effectively interpret maps from other department
  - Minimizing the utility of the maps, decreasing life safety
- Effective incident-level mapping should be "interoperable" across jurisdictions & disciplines
  - Common symbols for core incident functions is key to achieve interoperability

What We Will Do

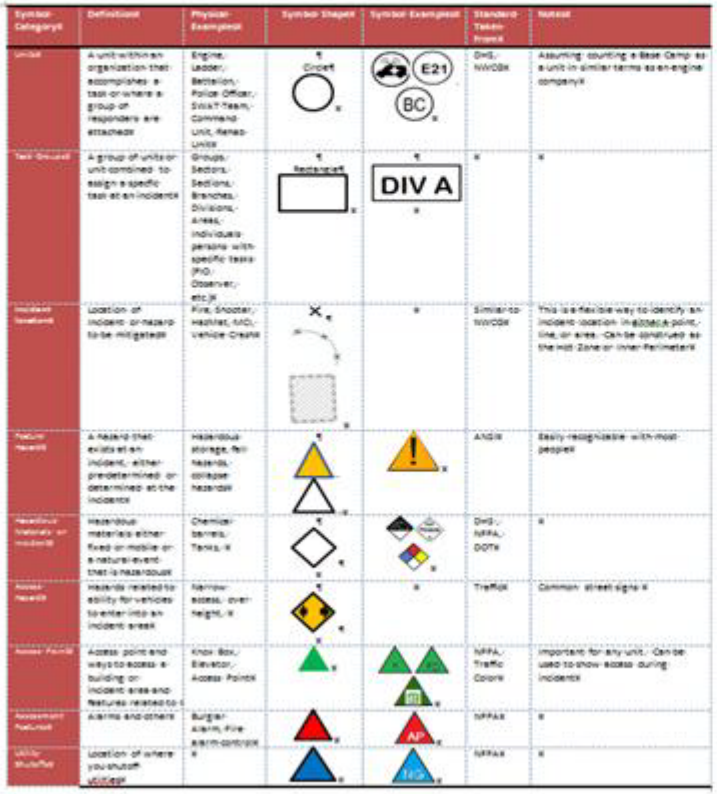
- Symbology standardization is a big issue
  - We are not setting standards in this meeting
- This is the "seed" for starting to develop:
  - Some parameters on how to develop common (or standard) symbology that support NIMS/ICS
  - 'Functional Requirements' for incident symbology
- Golden Opportunity
  - Long-Term: DHS & FEMA developing standard symbology to support NIMS/ICS
  - Short-Term: We are the practitioner voice to kick-off the effort, serving as basis for continued work

How We Will Do It - Methods

- Green Category Symbols
- Initial review of several existing standard symbol sets
- Harmonized most obvious symbols
- Working Group assesses initial review of:
  - Day 1 – Green symbols
  - Day 2 - Flexible Symbols



Flexible Symbols – Day 2



- What symbols need to be "customizable"?
- What are the basic "functional requirements" these flexible symbols?
- Why is it important to have "parameters" or "functional requirements" on flexible symbols?

Roadmap

- How should NAPSG, DHS, & FEMA support continued work in developing common (or standard) symbology?
- How should additional symbology work be linked to other related issues?
  - Data models, map templates, standard map products
- Think about the recommendations you want to give

Day 1 Wrap-up

- Meet at Microsoft
  - Shuttles provided from hotels to MSFT in AM
- Attend MSFT Conference
  - Breakfast at MSFT at 8:00am on Wednesday
- Day 2 Meetings start at 1:00pm
  - Bring back ideas & insights from conference sessions
- Muster for breakout session in afternoon

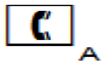
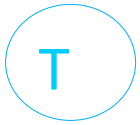
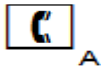
Groups

	Steve Precker	Chris	Rebecca
Tech	Sandi Cone	Steve Pollackov	Dave Blankenship
White Shirt	Dustin Morrow	Jim Potteiger	Rand Napoli
Blue Shirt	Len Waterman	Brian Green	Peter Hanna
	Peter DiTuri	Peter O'Rourke	Tricia Toomey
	Brent Sytsma	Mike Price	Ron Wieland
	Robert Johnson	Larry Rabel	Chris Tubbs
	Bill Deso	Pat Riley	Rich Vandame
		Margo English (notes)	

Appendix D: Green Symbols List

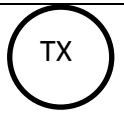
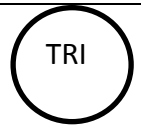
	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Fixed Operation Locations									
	Operations - Hospital									
	Operations - Fire Station									
	Operations - EMT Station Location							Note: is a station location different than a staging area? If so, then recommend use of this symbol; if not, then recommend use of staging area symbol.		
	Operation - Police									

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Operations - Medical Evacuation Helicopter Station							Is medivac only helicopter? If so, recommend use of symbol over the above.		
	Operations – Morgue									
	Operations – Prison									
Features with a Static Location During an Incident										
	Command - Incident Command Post									

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Telephone Station - Access							The NWCG symbol is blue; does the recommended symbol have to have a particular color?		
	Alert Devices - Emergency Exit									
	Alert Devices - Light									
	Alert Devices - Speaker/Horn									

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Fire Extinguishing System - Fire Fighting Equipment									
	Command - Air base									
	Command - Ambulance Staging							The NWCG symbol is for Medivac. Is this the same thing?		
	Command - Base Camp							Note: The "C" should fill up the bulk of the circle - unable to do given design capabilities.		
	Command - Discipline Staging Area		 discipline				 discipline	Note: The "S" should fill up the bulk of the circle - unable to do given design capabilities.		

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Command - Fire Origin	 date/time	 date/time				 date/time			
	Command - Vehicle Base						 Vehicle type			
	Command - Helibase							Note: The "H" should fill up the bulk of the circle - unable to do given design capabilities.		
	Command - Helipad									
	Command - Incident Site									

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Command - Media Location									
	Command - Observation Points							Note: the NWCG symbol is termed as "Lookout" but perhaps it's more effective to term the common IC symbol as "observation point."		I like this being the catch all symbol for an observation point or lookout
	Command - Treatment									TX is the medical abbreviation for Treatment
	Command - Triage									TRI is something that I created, definitely debaset

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Water Source - Hydrant									
	Other Water Source									
	HazMat									
	Emergency Shelter									
	Fire Operation									
	Law Enforcement Operation									
	Radioactive Materials									
	Toxic & Infectious									

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Fire Department Access									
	Police Department Access									

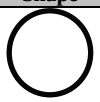
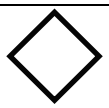
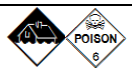
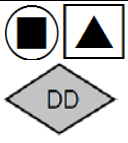
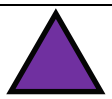
	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Sides of an Incident									I should have clarified on this one. There isn't any standard for the "side" or "exposure" of an incident except labeling it. This is different than Division A, which is a term for a ICS division and where it is located

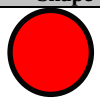
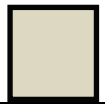
	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
Dynamic Incident Features										
	Escape Route									
	Fire Spread Prediction									
	Uncontrolled Fire Edge									
	Management Action Point									
	Hazardous Line									
	Non-Hazardous Line							Recommending that this symbol be developed for IC use		
	Command - Fire Direction									

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Safety Zones									
Static Incident Features										
	Water Tank									
	Drafting Site									
	Hose Connection									
	Key or Knox Box									

	Symbol Group	Chris' List	NWCG	HSIP List	NFPA	DHS FGDC Homeland Security Working Group	Recommended Symbol	Comments	Hand-drawn Options	Chris's Notes
	Compressed Natural Gas									
	Gas Shutoff									
	Electrical Shutoff									
	LP Gas Shutoff									
	Natural Gas Shutoff									
	Safety Hazard									

Appendix E: Flexible Functional Requirements Symbol List

Symbol Category	Definition	Physical Examples	Symbol Shape	Symbol Examples	Standard Taken from	Notes
Units	A unit within an organization that accomplishes a task or where a group of responders are attached	Engine, Ladder, Battalion, Police Officer, SWAT Team, Command Unit, Rehab Unit			DHS, NWCG	Assuming counting a Base Camp as a unit in similar terms as an engine company
Task Groups	A group of units or unit combined to assign a specfic task at an incident	Groups, Sectors, Sections, Branches, Divisions, Areas, Individuals persons with specific tasks (PIO. Observer, etc.)				The unfilled rectangle was the functional requirement for alarm devices from Chris' list, but it's also the polygon fill for IR Heat Perimeter found on the NWCG list. Given it is the symbol for multiple things there is much work to be done to harmonize and come to a consensus.
Feature Hazard	A hazard that exists at an incident, either pre-determined or determined at the incident	Hazardous storage, fall hazards, collapse hazards			ANSI	Easily recognizable with most people
Hazardous Materials or Incident	Hazardous materials either fixed or mobile or a natural event that is hazardous	Chemical barrels, Tanks,			DHS , NFPA, DOT	
Access Hazard	Hazards related to ability for vehicles to enter into an incident area	Narrow access, over height,			Traffic	
Access Point	Access point and ways to access a building or incident area and features related to	Knox Box, Elevator, Access Point			NFPA, Traffic Color	Important for any unit. Can be used to show access during incident
Assessment Features	Alarms and other	Burglar Alarm, Fire alarm control			NFPA	
Utility Shutoffs	Location of where you shutoff utilities				NFPA	
Detection/ Extinguishing Equipment	Detectors and building extinguishment systems	Smoke, Duct, Pull Station			NFPA	Subdued color; there are a number of different symbols for extinguishing systems.
Ventilation	Place to manage the exhaust of gases	Skylight, Smoke Control			NFPA	

Symbol Category	Definition	Physical Examples	Symbol Shape	Symbol Examples	Standard Taken from	Notes
Water Flow Control Valves and Water Sources	Water flow devices	Fire department connections, PIV			NFPA	
Equipment Rooms	Location of features				NFPA	Could be anything; this is also similar to manual alarm devices.

Appendix F: **Participant Feedback**

Below is a sampling of feedback provided by NAPSG working group members in response to the work done and goals achieved during the March 22-24 meeting.

Feedback from Working Group Members:

- "The success of our work is a testament to everybody's ability, intelligence, and teamwork. We accomplished a lot! I wanted to extend a special thanks to Steve Precker and Rebecca... I know it took a lot of behind the scenes work. So what's next? I believe this is the start of accomplishing some pretty good work and we have a lot of momentum behind us. I agree about expanding our work to other shapes and we do have to test the symbology we have." - *Chris Rogers, NAPSG Working Group Chairman, NAPSG Regional Coordinator, AND Firefighter w/ Kirkland Fire Department (WA)*

- "Great group of people and excellent progress towards a needed framework and symbology. Look forward to our future work together." - *Dustin Morrow, Deputy Chief, Tualatin Valley Fire & Rescue*

- "I just wanted to say thank you for putting this all together, and inviting me to participate. It was really helpful to see how others are using preplans and GIS in public safety... I sincerely hope all work being done within this working group can be leveraged to further the integration of GIS into public safety." - *Tricia Toomey, GIS Specialist (San Diego Region), Homeland Security Regional Technology Center, SDSU Research Foundation*

- "The positive, open, honest attitudes shown by all set the groundwork for some lively discussions which were a great educational tool for those of us climbing the learning curve! It's exactly how a working group should function." - *Brent Sytsma, Senior Fire Firefighter, Woodinville Fire & Rescue*

- "I will state on the record is that it was a privilege to work with every one on this group. Personally I think that we need to continue this working group for other items such as a standard for lines and polygons. I participated in a Hurricane drill this morning with the Nassau County Fire Service and many of the needed items were to section off damaged / flooded roadways and bridges with polygons." - *Captain Steven Pollackov, GIS Commanding Officer, Fire Department of New York City*

- "I, too, am so appreciative of such a highly-skilled array of professional talent gathered together. Our group did in two days what other like groups couldn't do in TWO YEARS. Our ability to respectfully debate and discuss issues and come to clear consensus was so profoundly quick and decisive…" - *Pete Di Turi, Lead GIS Analyst, Seattle Fire Department*