Twin Cities GECCo Workshop

October 27-28, 2011

AFTER ACTION REPORT/ IMPROVEMENT PLAN

MAY 31, 2012

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NOTE: In addition to the contents as listed above, substantial additional event information is available from the Twin Cities GECCo website located at: https://sites.google.com/site/tcgecco/.

EXECUTIVE SUMMARY

As described in literature of the Geospatial Information and Technology Association (GITA), the concept behind the Geospatially Enabling Community Collaboration (GECCo) program is as follows:

> No matter the root cause of an emergency – terrorism, natural occurrences, or unintentional human error – the methods of responding to, mitigating, and ideally preventing reoccurrences are based on a coordinated approach that can be greatly enhanced by the use of geospatial information and technology. This cannot happen without enabling the many mutually dependent agencies and organizations charged with protecting our nation's citizens and infrastructure to efficiently and effectively share their information. GITA's GECCo initiative was developed to address the obstacles that need to be overcome before this can happen.

With regard to conduct of a GECCo event, the objective is stated as follows:

> The purpose of the GECCo initiative is to facilitate an interactive dialogue at the local level among community infrastructure stakeholders and emergency responders to begin to address collaboration and information exchange issues that inhibit effective response and recovery in times of emergency. The working sessions employ an interactive, cooperative approach to enhance existing security-related efforts and enable community stakeholders to develop a framework by which public and private organizations can better collaborate in order to protect critical infrastructure and respond more effectively to emergency situations.

In keeping with the ideas above, and after more than 18 months of planning, the Twin Cities Geospatially Enabling Community Collaboration (TCGECCo) Workshop was held at the Fort Snelling Officer's Club in the Fort Snelling Unorganized Territory, Minnesota, on October 27-28, 2011. It was the eighth event in a series of workshops that have been conducted by the GITA at locations across the United States since 2004. Although each GECCo event has been tailored to accommodate unique community circumstances, the main theme for each has been facilitation of geospatial collaboration among infrastructure and data stakeholders in support of emergency preparedness and response efforts. As a result, Department of Homeland Security (DHS) programs such as Automated Critical Asset Management System (ACAMS), Homeland Infrastructure Foundation-Level Data (HIFLD) Working Group, Homeland Security Infrastructure Protection (HSIP), Homeland Security Information Network (HSIN), and the DHS Office of Infrastructure Protection have also benefited substantially from this effort. However, ultimately, the GECCo program is about encouraging development of *an ongoing process in a region* so that utilities, units of government, private enterprise, and others with geospatial information relevant to disaster response can effectively contribute their data so that it benefits all.

The Twin Cities GECCo was the second event funded primarily by DHS. However, GITA, MetroGIS, SharedGeo, and the University of Minnesota, also contributed substantial manpower and/or funds to make the event possible. Furthermore, 20 other organizations donated administrative, event, planning, or technical support. Thus, the Twin Cities GECCo Workshop was the largest and most dynamic event in the history of the program.

The three key components of the National Spatial Data Infrastructure (NSDI) as identified by the Federal Geographic Data Committee (FGDC) were used as the event planning guideposts: Technology, People, and Policies. Although a detailed event agenda has been attached as Appendix E, the overall structure of learning was as follows:

1. An introductory series of lectures which imparted workshop goals and objectives, lessons learned to date, and an overview about the application of geospatial information technologies to Emergency Management planning, mitigation, response, and recovery. This portion of the program defined the scope of work and established the basis for the remainder of the TCGECCo event. (Overview - 90 minutes)
2. A block of instruction about Federal efforts affiliated with the Infrastructure Information Collection Division (IICD) as given by the DHS HIFLD to the Region (HTTR) Regional Geospatial Analyst. A representative of the local Civil Air Patrol (CAP) also contributed to this block designed to help participants understand basic DHS geospatial programs and resources, and provide information on at least one Federal remote sensing capability. (Technology - 90 minutes)
3. A lunch time presentation meant to help participants understand the need to use standards in geospatial efforts that support the Emergency Services Sector (ESS). (Technology – 60 minutes)
4. A cluster of six local stakeholder presentations and follow-on panel discussion that outlined local/regional synergistic geospatial programs. The goal of this set of talks was to provide networking opportunities, create awareness about regional and local activities, and foster an open discussion about barriers to collaboration. (People/Policies – 210 minutes)
5. A table-top exercise which was designed to promote discussion about interoperability needs, barriers to collaboration, touch-points among local/Federal programs, and promote an overall awareness about the geospatial needs of first responders. (Putting it all Together – 150 minutes)
6. A round-table discussion about lessons learned during the previous day and one-half of workshop activities. Facilitators ingested significant points from this discussion and used them to formulate the basics of a move-forward plan for improving collaboration. (Group Takeaways – 60 Minutes)
7. A lunch time keynote presentation devoted to the Geospatial Revolution and related data issues that require attention of Decision Makers. (Anticipating the Future - 60 minutes)
8. A final report-out session where local, regional, and state-level Decision Makers were presented with some initial, collaborative move-forward recommendations. (Improvement Plan Development – 90 minutes)

This delivery of learning used two different tracks to reach two very different core groups. Practitioners participated in all events described above, while Decision Makers (see page 15 for a by name listing) participated only in the final two events. In addition, electronic and paper surveys were conducted throughout the TCGECCo.

The main TCGECCo events at the Fort Snelling Officer's Club were augmented by a special presentation at the Metropolitan Counties Emergency Services Building in St. Paul, Minnesota on the first evening of the workshop. During this event, Dr. Carl Reed, Chief Technology Officer at the Open Geospatial Consortium (OGC), provided the greater Minnesota geospatial community with an in depth discussion on forthcoming geospatial technology issues.

Overall event participation was substantial:

Total practitioner attendance (both days):	57
Total decision maker attendance:	15
Total event staff and support personnel attendance:	12
Total Dr. Carl Reed presentation attendance:	32
Total Attendance	116

As compared to the first GECCo event funded by DHS (Dallas-Fort Worth, Texas, June 16-17, 2011), the Twin Cities GECCo was nearly three (3x) times as large.

Group composition was exceptionally well balanced with participants representing four key communities in nearly equal numbers: Public Service, Emergency Services, Infrastructure, and Business. In addition, individuals from five out of the seven metro counties participated, as well as individuals from the cities of Minneapolis and St. Paul. In total, participants in the Fort Snelling activities represented 67 different public-private organizations.

Although GECCo workshops by design feature an extended period of training prior to commencing the tabletop exercise, the tabletop is the focal point of each workshop because of its ability to bring together multiple elements of the GECCo learning process. However, since geospatial technologies have a functional role in nearly all Common and Mission Area Target Capabilities enumerated by the DHS Target Capabilities List (TCL), GECCo tabletops typically do not cleanly match against specific DHS Homeland Security Exercise and Evaluation Program (HSEEP) standards. Nevertheless, for the Twin Cities GECCo, the following standard background information is provided:

The Twin Cities Metropolitan Region Catastrophic Wind (#10 Major Hurricane - Modified) tabletop exercise "Mayday, Mayday" was developed to test the Twin Cities Metropolitan Region's, Planning, Communications, and Intelligence and Information Sharing and Dissemination capabilities. The exercise planning team was composed of numerous and diverse agencies, including GITA National, GITA Minnesota, Delta State University, EMA, Inc., Minnesota Department of Agriculture, Minnesota Geospatial Information Office (MnGeo), MetroGIS, Dakota County, FBI InfraGard, Bloomington Fire Department and SharedGeo. The

exercise planning team decided upon a tabletop that would strongly encourage development of public-private relationships, facilitate anticipatory planning discussions, and offer a fast pace of events which would simulate the quickly unfolding events of a disaster, thereby delivering a sense of urgency to participants. For the first ever geospatial information technology tabletop conducted in the Twin Cities, a multiple tornado scenario was selected for its applicability to climatic conditions in the region. Exercise planning took approximately two (2) months, of the 18 months total, devoted to developing the Twin Cities GECCo.

Based on the exercise planning team's deliberations, the following objectives were developed for the Table Top Exercise (TTX) portion of the TCGECCo:

- Objective 1: Develop awareness about the need to conduct anticipatory planning,
- Objective 2: Develop awareness about the use of geospatial technologies throughout the Emergency Management cycle,
- Objective 3: Develop awareness about the need to employ geospatial product production standards that will facilitate interoperability for the Emergency Services Sector (ESS).

The remaining sections of this report analyze overall event results, identify strengths to be maintained and built upon, identify potential areas for further improvement, and support development of corrective actions.

Major Strengths

The major strengths identified during the TCGECCo are as follows:

- The Twin Cities Metropolitan Region has an exceptional advanced geospatial community that is open to the concepts of data sharing and process improvement.
- The Twin Cities Metropolitan Region has an exceptional advanced public-private collaborative community (i.e., InfraGard) that is interested in facilitating the exchange of all types of information for the public good.
- The Twin Cities Metropolitan Region has progressive Decision Makers on many levels that are willing to champion well defined programs that will facilitate the sharing of geospatial data and services.

Primary Areas for Improvement

Throughout the event, several opportunities for improvement in the Twin Cities Metropolitan Region's ability to respond to future incidents were identified. The primary areas for improvement, including recommendations, are as follows:

- ***There is currently no regional Implementing Authority (IA) that directs development of geospatial technologies for emergency preparedness and response purposes.***

  Recommendation: MetroGIS should convene a work group to develop a plan that identifies an IA for the region. Specific to developing a plan for this issue, the following points should be considered:

  - Work group composition should be as diverse and as senior as possible, with adequate representation from the Emergency Services, Public Service, Geospatial, and Infrastructure/Business communities,
  - The plan for the IA should include an organizational approach that supports Incident Command System (ICS) needs without creating duplication in existing administrative or data management structures,
  - To the maximum extent possible, the plan for the IA should use a structure that has the potential for cross community authority, and
  - The work group final report should address the financial and logistic support needed to fully implement the envisioned IA.

- ***There is currently no formalized integration plan that addresses how geospatial technologies should fit into local and regional command and control structures/organizations.***

  Recommendation: Upon designation of an IA as discussed in above, a first order of business should be completion of an overall needs assessment and corresponding plan to incorporate geospatial technologies into command and control structures/organizations. Specific to developing the plan for this issue, the following points should be considered:

  - There is currently a lack of dynamic, ongoing discussions between the ESS and geospatial communities,
  - There is currently a lack of dynamic, ongoing discussions between Decision Makers and geospatial practitioners,
  - There is currently no effort to formally incorporate geospatial capabilities into exercises conducted on the local and regional level,
  - There is currently a need for executive-level education that will create awareness about rapid advances, and increasing capabilities, of geospatial technologies,
  - There is currently a lack of awareness that some critical geospatial data sets are 'siloed', and
  - There is currently a limited understanding about the extent of interdependent infrastructures and cascading effects when a failure occurs in one system.

- ***There are no agreed upon legal or technical protocols that facilitate the exchange and use of geospatial data in support of the Emergency Services Sector.***

  Recommendation: MetroGIS and State data practices authorities should immediately commence discussions to create a standard Memorandum of Understanding (MOU) for the exchange of geospatial data between interested parties. MetroGIS should also convene a work group whose duties will include recommending the technical protocols to be used in conjunction with the MOU. Specific to developing a plan for this issue, the following points should be considered:
  - In depth consideration should be given to specific needs of responders, local government, and industry as identified during needs assessment activities as described in the preceding "Primary Areas for Improvement",
  - There is the potential to save collaborators significant financial outlays and administrative burden by collaboratively developing and maintaining common data sets for emergency preparedness and response,
  - Every effort should be made to align approaches and products with approved national and state standards, and
  - There is currently no regional standard for the communication of location information by the Emergency Services Sector.

The Twin Cities GECCo was considered successful in all four areas identified as overall workshop goals:

- Networking among peers, across multiple sectors
- Education and awareness
- Defining actionable goals – to improve the use of geospatial information in the Twin Cities
- Facilitating an environment that institutionalizes geospatial data/technology/practices over time

Potential follow-on exercise efforts are thought to include:

- The use of locally managed geospatial focused table-tops as ongoing learning and evaluation events,
- A TCGECCo sequel event focusing on hands-on practical use of Critical Infrastructure/Key Resources (CI/KR) related geospatial systems such as HSIN, HSIP, OneView, DHS Earth, and U.S. National Grid (USNG) and
- An event devoted to relevant non-traditional collaborative tools such as social media, open source mapping programs, and Emergency Management software.

Section 1: Exercise Overview

Exercise Details

Exercise Name

The Twin Cities Geospatially Enabling Community Collaboration (GECCo) Workshop

Type of Exercise

Workshop with tabletop

Exercise Start Date

October 27, 2011

Exercise End Date

October 28, 2011

Duration

2 days

Location

Fort Snelling Officer's Club, Fort Snelling Unorganized Territory, Minnesota

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Program

IICD Purchase Order S11FMH063 of March 22, 2011

Mission

- Preparedness
- Response
- Recovery

Capabilities

- Planning
- Communication
- Intelligence and Information Sharing and Dissemination

Scenario Type: Catastrophic Wind (#10 Major Hurricane - Modified)

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Participants

Organizations Represented

- Alliance Pipeline
- American Red Cross (ARC)
- Carver County
- CenterPoint Energy
- Center for Urban and Regional Affairs (CURA) - University of Minnesota
- City of Eden Prairie
- City of Edina
- City of Lakeville
- City of Maple Grove

- City of Minneapolis
- City of St. Paul
- Common Ground Alliance
- Connexusenergy
- Dakota County
- Delta State University
- Eagle Eye Consulting
- EMA, Inc.
- Excel Energy
- Federal Bureau of Investigation (FBI)
- Federal Executive Board, Minnesota (FEB)
- Geospatial Information and Technology Association (GITA)
- Gopher One State
- Hennepin County
- Hinshaw and Culberson, LLP
- InfraGard, Minnesota Chapter
- Local Government Information Systems Association (LOGIS)
- Metro Transit
- MetroGIS
- Metropolitan Airports Commission (MAC)
- Metropolitan Council
- Metropolitan Emergency Services Board (MESB)
- Metropolitan Mosquito Control District (MMCD)
- Metropolitan State University
- Minnesota Department of Agriculture
- Minnesota Department of Administration
- Minnesota Department of Human Services
- Minnesota Department of Natural Resources (DNR)
- Minnesota Department of Transportation (MnDOT)
- Minnesota Geospatial Information Office (MnGeo)
- Minnesota National Guard (MNNG)
- Minnesota Office of Enterprise Technology (OET)
- Minnesota State Fire Marshal/Pipeline Safety Office
- Minnesota Wing Civil Air Patrol (CAP)
- National Guard Bureau (NGB)
- National Geospatial Advisory Council (NGAC)
- National States Geographic Information Council (NSGIC)

- National Weather Service (NWS)
- North Point Geographic Solutions
- Open Geospatial Consortium, Inc. (OGC)
- Ramsey County
- Rice County
- SharedGeo
- Survive and Thrive, LLC
- Target Corporation
- Three River Parks District
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Agriculture (USDA)
- U.S. Department of Defense Emergency Preparedness Liaison Team to Minnesota
- U.S. Department of Homeland Security (DHS)
- U.S. Geological Survey (USGS)
- United Health Group
- United Services Group/Great River Energy
- University of Minnesota
- Utility Integration Solutions
- Washington County
- West Central Environmental Consultants, Inc.
- Wells Fargo

Decision Maker Attendees

- David Arbeit, PhD - Minnesota Geospatial Information Officer (GIO), Minnesota Department of Administration
- Laurie Beyer-Kropuenske - Director, Information Policy Analysis Division, Minnesota Department of Administration
- Prof. Will Craig:
  - Associate Director of the Center for Urban and Regional Affairs, and
  - Past President, National States Geographic Information Council
- Mark Kotz – Geographic Information System (GIS) Database Administrator, Metropolitan Council
- Christine Kuennen - Manager, Metro Transit Control Center
- Robert Maki - Chief Information Officer (CIO), Minnesota Department of Natural Resources
- Ray Morris - Executive Director, Federal Executive Board – Minnesota

- Mark F. Palma, Cameron, WI:
  - Attorney, Hinshaw & Culbertson LLP,
  - General Counsel to Gopher State One Call, and
  - Special Counsel to the Common Ground Alliance
- Carolyn Parnell - State Chief Information Officer, State of Minnesota
- Alyssa Poucher - Deputy Director, Federal Executive Board - Minnesota
- Jerry Rosendahl:
  - Minnesota State Fire Marshal, Minnesota Department of Public Safety,
  - Director of Pipeline Safety, Minnesota Department of Public Safety, and
  - Wing Commander, Minnesota Civil Air Patrol
- Cindi Salas, Houston, TX:
  - Director, Land and Field Services, CenterPoint Energy, and
  - Member of the National Geospatial Advisory Committee
- Chris Terzich:
  - Vice President, Incident Management, Wells Fargo and Company, and
  - President, Minnesota Chapter of InfraGard
- Ben Verbick - GIS Coordinator, Local Government Information Systems Association
- Eric Waage - Director, Emergency Preparedness, Hennepin County

Number of Participants

- Attendees (Practitioners – Main TCGECCO Event): 57
- Attendees (Decision Makers – Main TCGECCo Event): 15
- Attendees (Dr. Reed Presentation): 32
- Evaluators (Support): 6
- Facilitators (Instructors): 6
- Total: 116

Twin Cities Event Enhancements

Base on suggestions provided by DHS after the Dallas-Fort Worth GECCo event, and other ideas brought forward during the development of the TCGECCo, the following GECCo program enhancements were made during delivery of the TCGECCo:

Promotional Efforts

- Developed electronic flyer for distribution by local event partners
- Developed event outreach website (http://sites.google.com/site/tcgecco/))
- Developed standardized invitation letters and emails

Event Support

- Developed event planning website (site restricted to planners)
- Developed GECCo email (gitagecco@gmail.com), and administrative support features
- Developed improved GECCo symbol
- Developed standardized GECCo PowerPoint template
- Deployed event ticketing site to closely manage attendance (Eventbrite)

Overall

- Added Decision Maker "Next Steps" event
- Added lunch time keynote addresses by subject matter experts
- Developed add-on evening event focused on the local geospatial community
- Developed a standardized event flow for use at follow-on GECCos
- Distributed attendee roster upon arrival to facilitate networking
- Distributed names tags with sector identification symbols to facilitate networking
- Issued attendance certificates and GISP credit information to attendees
- Recorded events for playback on the TCGECCo site
- Used event site with contract food service to maximize available event time

Table Top Exercise (TTX)

- Distributed TTX background information and scenario on morning of day one to minimize "spool up" time on day two
- Used local planning team of experts to develop TTX
- Pre-assigned attendees into work groups to ensure a balance of expertise during TTX
- Used University of Minnesota graduate students as dedicated work group note takers to ensure maximum data capture
- Used large screen TV with countdown clock to keep TTX on schedule

Event Feedback

- Deployed Poll Everywhere to capture audience reaction to topical discussions
- Developed local issues Survey Monkey to capture group opinion per way forward
- Developed paper event survey to capture overall event satisfaction
- Transitioned TCGECCo After Action Report to HSEEP template format to facilitate sharing of Lessons Learned and create actionable plan for correcting deficiencies

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SECTION 2: EXERCISE DESIGN SUMMARY

Exercise Purpose and Design

As defined by the agenda, the specific purpose of the Twin Cities Geospatially Enabling Community Collaboration (TCGECCo) Workshop was:

> To build on the experiences and knowledge gained from previous local and regional efforts in the greater Twin Cities area in order to further examine and begin resolving collaboration and geospatial information exchange issues that inhibit effective critical infrastructure protection, and emergency preparedness and response.

Event conduct was managed by Geospatial Information and Technology Association (GITA) and funded by the Department of Homeland Security (DHS), MetroGIS and SharedGeo. Using event templates and guidance provided by GITA, a local planning team led by Steve Swazee, SharedGeo, developed the agenda for the event. Contributing to overall workshop design were: Randall Johnson, MetroGIS, Fire Chief Ulie Seal, Bloomington Fire Department, and Chris Terzich, FBI InfraGard/Wells Fargo. Tabletop scenario and support materials were developed by Dave DiSera, EMA, Inc.; Mike Dolbow, Minnesota Department of Agriculture; Jeff Grussing, Great River Energy; John Hoshal, Minnesota Geospatial Information Office; and Randy Knippel, Dakota County.

After exploratory discussions about event supportability in the Twin Cities Region proved successful in spring 2010, GITA announced it would bring a Geospatially Enabling Community Collaboration (GECCo) workshop to the Twin Cities metro area in 2011. In collaboration with the local planning team, event date and venue selection commenced in May 2011; with agenda, tabletop, and support planning occurring in the three months prior to the event.

Exercise Objectives, Capabilities, and Activities

By design, GECCo workshops feature an extended period of training prior to commencing the tabletop exercise. Consequently, exercise objectives are considered to be twofold: overall, and tabletop specific. With regard to overall objectives, as enumerated in the TCGECCo agenda, they were:

- Explain and document local geospatial constraints that could hinder disaster/emergency responders.
- Within the context of defining how the geospatial community can assist the emergency services sector:
    - Identify local initiatives and resources and discuss how to improve the flow of information and data among Federal, tribal, State, regional, and local data resources and stakeholders.
    - Gain an understanding of the geospatial programs, tools, methods, and data

available from the Department of Homeland Security (DHS) for helping infrastructure managers, first responders, emergency managers, and homeland security officials.
    - Gain an awareness of geospatial standards and resources currently used by the disaster/emergency response GIS and remote sensing communities of practice.
    - Enhance understanding of Geospatial Information Technology (GIT) as a key tool for supporting critical infrastructure protection and Emergency Management and their interdependencies.
    - Examine data sharing and collaboration issues and opportunities among public and private infrastructure owners (governments, utilities, first responders, etc.).
    - Benefit from GITA's GECCo body of knowledge from previous workshops in other regions, including how to turn data into actionable information for responders and Decision Makers at all levels and areas of interest.
- Define actionable next steps for improving collaboration, information exchange, and data quality/format needs to support more effective infrastructure protection, and emergency preparedness and response.

The tabletop portion of a GECCo is considered the focal point of the workshop because it brings together multiple elements of the learning process. However, since geospatial technologies have a functional role in nearly all Common and Mission Area Target Capabilities enumerated by the DHS Target Capabilities List (TCL), GECCo tabletops typically do not cleanly match against specific DHS Homeland Security Exercise and Evaluation Program (HSEEP) standards.

Nevertheless, for the Twin Cities GECCo tabletop, the following standard background information is provided:

Capabilities-based planning allows for exercise planning teams to develop exercise objectives and observe exercise outcomes through a framework of specific action items that were derived from the TCL. The capabilities listed below form the foundation for the organization of all objectives and observations in this exercise. Additionally, each capability was linked to several corresponding activities and tasks to provide additional detail.

Based upon the identified exercise objectives below, the exercise planning team decided to demonstrate the following capabilities during this Table Top Exercise (TTX):

- **Objective 1: Develop awareness about the need to conduct anticipatory planning.**
    - **Planning**: Conduct Strategic Planning; Develop/Revise Operational Plans; and Validate Plans.
    - **Communications**: Develop and Maintain Plans, Procedures, Programs and Systems; and Provide Emergency Operations Center Communications Support.

  - **Intelligence and Information Sharing and Dissemination**: Develop and Maintain Plans, Procedures, Programs and Systems; Incorporate All Stakeholders in Information Flow; Vertically Flow Information; Horizontally Flow Information

- **Objective 2: Develop awareness about the use of geospatial technologies throughout the Emergency Management cycle**.
  - **Planning**: Conduct Strategic Planning; Develop/Revise Operational Plans; and Validate Plans.
- **Objective 3: Develop awareness about the need to employ geospatial product production standards that will facilitate interoperability for Emergency Services Sector (ESS).**
  - **Planning**: Conduct Strategic Planning; Develop/Revise Operational Plans; and Validate Plans.
  - **Communications**: Develop and Maintain Plans, Procedures, Programs and Systems; Alert and Dispatch; Provide Incident Command/First Responder/First Receiver/Interoperable Communications; and Provide Emergency Operations Center Communications Support.
  - **Intelligence and Information Sharing and Dissemination**: Develop and Maintain Plans, Procedures, Programs and Systems; Incorporate All Stakeholders in Information Flow; Vertically Flow Information; Horizontally Flow Information

Scenario Summary

The Twin Cities GECCo tabletop was based on a Catastrophic Wind (#10 Major Hurricane - Modified) scenario involving multiple touchdown events across the metropolitan region by severe tornados. Participants were divided into four work groups and given a developing weather scenario the evening before the tabletop as a way of simulating the opportunity to do anticipatory planning within respective specialties. Tabletop play commenced the next morning after participants received a fast paced review of available geospatial technologies that could be of value to them throughout the Emergency Management Cycle. Modules then followed that advanced events through the preparedness, response, and recovery phases of the Emergency Management Cycle. In doing so, specific consideration was given to issues related to anticipatory planning, play within a multi-jurisdictional event, information sharing, interdependencies of infrastructure, op-tempo, and collaboration. A complete scenario packet is attached as Appendix F.

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SECTION 3: ANALYSIS OF CAPABILITIES

This section of the report reviews the performance of exercised Capabilities and Activities. The objectives of Twin Cities Geospatially Enabling Community Collaboration (TCGECCo) Workshop link directly to Capabilities listed below. In turn, each Capability will have several Activities, and each Activity flows to an Observation, References, Analysis, and Recommendations. The list of References shown for each Activity comes from the "Critical Tasks" standards enumerated by the Department of Homeland Security (DHS) Target Capabilities List (TCL), and are specific to that Activity. These "Critical Tasks" standards serve as benchmarks for evaluating the ability to perform the named Activity.

A listing of all references used in this document is available as Appendix I.

CAPABILITY 1: PLANNING

Capability Summary: As defined by the Department of Homeland Security Target Capabilities List:

> Planning is the mechanism through which Federal, State, local and tribal governments, non-governmental organizations (NGOs), and the private sector develop, validate, and maintain plans, policies, and procedures describing how they will prioritize, coordinate, manage, and support personnel, information, equipment, and resources to prevent, protect and mitigate against, respond to, and recover from Catastrophic events…
>
> Unlike the other target capabilities, the attributes of planning are difficult to quantify, as individual planners may have considerably varied education and experience and still produce plans that lead to the successful implementation of a target capability. The focus of the Planning Capability is on successful achievement of a plan's concept of operations using target capabilities and not the ability to plan as an end unto itself….

Like most elements of the TCGECCo workshop, this Capability was a self-graded item evaluated through group-discussions and event surveys.

Activity 1.1: Conduct Strategic Planning

Observation 1.1: Area for Improvement. There is currently no regional Implementing Authority (IA) that directs geospatial technology development for emergency preparedness and response purposes.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComA 2.9.2: Identify, develop, and convene local preparedness planning organization(s).
2. ComA 2.2.2: Coordinate and integrate all response and recovery agencies/organizations in the planning process
3. ComA 2.2.3: Coordinate and integrate nongovernmental organizations and the private sector entities into the Emergency Management planning and decision-making processes

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

Rapid advancements in geospatial technologies have resulted in laws and policies that have not kept up with technical developments. The recent U.S. Supreme Court ruling in *United States v. Jones*, and congressional inquiries into cell phone location tracking are cases in point. Indeed, only recently has the Department of Homeland Security tried to define geospatial technology roles and responsibilities for *Federal interagency* all-hazards response efforts (*Federal Interagency Geospatial Concept of Operations* (GeoCONOPS)). Therefore, it should come as no surprise that the Twin Cities Region is without an IA for directing development of geospatial technologies for crisis and Emergency Management purposes. Although there are Geographic Information System (GIS) efforts that focus on an aspect of emergency preparedness and response like 9-1-1 services of the Metropolitan Emergency Services Board, and various constituent focused organizations like GIS user groups, MetroGIS, and the Minnesota Geospatial Information Office Emergency Preparedness Committee (EPC), there is no specific entity that has a mandate to pull together disparate regional geospatial efforts in a cohesive way that will facilitate geospatial support of the region's Emergency Services Sector (ESS).

Recommendations: The following recommendations are offered:

1. MetroGIS should convene a work group to develop a plan that identifies an Implementing Authority (IA) for the region. Specific to developing that plan, the following points should be considered:
    a. Work group composition should be as diverse and as senior as possible, with adequate representation from the Emergency Services, Public Service, Geospatial, and Infrastructure/Business communities,
    b. The plan for the IA should include an organizational approach that supports Incident Command System (ICS) needs without creating duplication in existing administrative or data management structures,
    c. To the maximum extent possible, the plan for the IA should use a structure that has potential for cross-community authority

d. The work group final report should address the financial and logistic support needed to fully implement the designated Implementing Authority.

2. In an effort to keep Metropolitan Region Decision Makers informed of rapid advancements in the geospatial world going forward, as well as progress on recommendations made herein, the MetroGIS work group identified above should develop a plan for keeping regional executive level leaders informed of ongoing developments.

Activity 1.2: Develop/Revise Operational Plans

Observation 1.2: Area for Improvement. There is currently no formal integration plan that addresses how geospatial technologies fit into local and regional command and control structures/organizations.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComA 2.1.3: Develop and maintain Comprehensive Emergency Management Plans (CEMPs) or similar Emergency Management/preparedness plans
2. ComA 2.4: Develop emergency operations/response plans that describe how personnel, equipment, and other governmental, nongovernmental, and private resources will support and sustain incident management requirements
3. ComA 2.3: Develop and execute mutual aid assistance agreements and compacts
4. ComA 2.3.3: Develop regional coordination plans or activities that involve all Federal, State, local, territorial, tribal, NGO, and private stakeholders

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

Similar in nature to the previous observation, there exists no comprehensive plan for incorporating geospatial technologies and associated personnel into the command and control structures/organizations of the region's ESS community. Again, this is a hallmark of an emerging technology that has been addressed effectively only by a handful of organizations such as the National Wildfire Coordinating Group (NWCG), where partners have long been forced to work together collaboratively to address mutual emergency response needs through deployment of cutting edge approaches to geospatial technology. As a result, efforts like the NWCG are at least five years ahead of the greater ESS community in development of operational guidance and integration of GIS into their operations. Thus, the finding that the Twin Cities Region is lacking in this activity should be considered a typical result for most major metropolitan regions across the nation.

Recommendations: The following recommendations are offered:

1. Upon designation of an IA as discussed in Activity 1.1, the IA should complete an overall needs assessment and corresponding plan to incorporate geospatial technologies into local and regional command and control structures/organizations. Specific to the IA developing a plan for this issue, the following points should be considered:
    a. There is currently a lack of dynamic, ongoing discussions between the ESS and geospatial communities, and
    b. There is currently a lack of dynamic, ongoing discussions between Decision Makers and geospatial practitioners.
2. As part of the overall effort going forward by the IA, a Standard Operating Procedures (SOP) document should be developed that addresses training and operational standards.

Activity 1.3: Validate Plans

Observation 1.3: Area for Improvement. There is currently no effort to formally incorporate geospatial capabilities into exercises conducted on the local and regional level.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComA 3.6: Ensure that trained, exercised, and equipped personnel are available to execute all planning requirements as determined by applicable standards of proficiency
2. ComA 3.1: Develop exercises/drills of sufficient intensity to challenge management and operations and to test the knowledge, skills, and abilities of individuals and organizations
3. ComA 3.4: Develop lessons learned reports and procedures based on real world events and exercises

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

Almost to a person, attendees of the TCGECCo indicated the event was the first time they had participated in a disaster Table Top Exercise with a geospatial information and technology focus. Moreover, despite many of the geospatial community attendees being on the top rung of the region's practitioner community, few had ever participated in any kind of disaster exercise. Similarly, of the attendees who had participated in other Table Top Exercises, indications of seeing geospatial planning brought into play during those

events were rare. Thus, the bottom line of this finding is the old Army advantage: "You fight, like you train." Unless the geospatial and ESS communities work together to bring geographic situational awareness elements into exercises, there can be no expectation that the capability will exist during a real event.

Recommendations: The following recommendation is offered: As part of the overall needs assessment discussed in Activity 1.2, a plan should be offered by the IA for incorporating geospatial play and teaching points into local and regional disaster exercises.

CAPABILITY 2: COMMUNICATIONS

Capability Summary: As defined by the Department of Homeland Security Target Capabilities List:

> Communications is the fundamental capability within disciplines and jurisdictions that practitioners need to perform the most routine and basic elements of their job functions. Agencies must be operable, meaning they must have sufficient wireless communications to meet their everyday internal and emergency communication requirements before they place value on being interoperable, i.e., able to work with other agencies.
>
> Communications interoperability is the ability of public safety agencies (police, fire, EMS) and service agencies (public works, transportation, hospitals, etc.) to talk within and across agencies and jurisdictions via radio and associated communications systems, exchanging voice, data and/or video with one another on demand, in real time, when needed, and when authorized. It is essential that public safety has the intra-agency operability it needs, and that it builds its systems toward interoperability.

Like most elements of the TCGECCo workshop, this capability was a self-graded item evaluated through group-discussions and event surveys.

Activity 2.1: Develop and Maintain Plans, Procedures, Programs, and Systems

Observation 2.1: Area for Improvement. There is currently no agreed legal or technical protocols for the region that facilitate the exchange and use of geospatial data in support of the Emergency Services Sector.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComC 1: Develop communication plans, policies, procedures, and systems that support required communications with all Federal, regional, State, local, and tribal governments and agencies as well as voluntary agencies
2. ComC 1.2.1: Develop procedures for the exchange of voice and data with Federal, regional, State, local, and tribal agencies, as well as voluntary agencies
3. ComC 1.6: Develop supplemental and back-up communications and information technology plans, procedures, and systems
4. ComC 1.6.2: Identify emergency communications and data requirements for each stakeholder
5. ComC 1.7.3: Develop plans to provide telecommunication and information technology support to Federal, regional, State, tribal and local officials and the private sector
6. ComC 1.3: Establish and maintain information systems across response entities

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

Without agreement on the technical and legal parameters by which geospatial data will be shared between entities in the Twin Cities Region, situational awareness interoperability is not possible. Hurdles include proprietary issues, data protection concerns, disparate technical capacity, and administrative and financial restrictions on data accessibility. These are not issues practitioners can solve. Therefore, engagement from the decision/policy making community is required before there can be any real chance of developing the interchange of geospatial data needed to provide near real-time situational awareness for the region's ESS.

Recommendations: The following recommendations are offered:

1. MetroGIS and State data practices authorities should immediately commence discussions to create a standard Memorandum of Understanding (MOU) for the exchange of geospatial data between interested parties.
2. The MetroGIS Work Group identified at Activity 1.1 should develop recommended technical protocols to be used in conjunction with the MOU. Specific to developing a plan for this issue, the following points should be considered:
    a. In depth consideration should be given to specific needs of responders, local government, and industry as identified during the IA needs assessment,
    b. There is the potential to save collaborators significant financial outlays and administrative burden by collaboratively developing and maintaining common data sets for emergency preparedness and response, and
    c. Every effort should be made to align approaches and products with approved national and state standards.

3. MetroGIS should encourage champions from the decision/policy making community to join the process as soon as possible.

Activity 2.2: Alert and Dispatch

Observation 2.2: Area for Improvement. There is currently no regional standard for communicating location information by the Emergency Services Sector.

References: See Appendix I for a complete list. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComC 4.2: Implement incident communications interoperability plans and protocols
2. ComC 4.2.1.1: Use established common response communications language (i.e., plain English) to ensure information dissemination is timely, clear, acknowledged, and understood by all receivers

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

No point examined during the TCGECCo ultimately produced as strong a consensus as did the proposed solution for this issue. Given few, if any, regions of the nation currently have a standard for communicating location during ESS operations, this topic also created spirited discussion and analysis. However, as each potential solution for this issue was considered, options were eliminated until the U.S. National Grid (USNG) was overwhelmingly identified as the geospatial "best practice" for this issue. A finding that was reaffirmed through five different types of data collection: Electronic Audience Reaction Polling (EARP), a mid-event online survey, verbal comments, TTX work group notes, and a post event workshop evaluation. Since this group of nearly 70 practitioners and facilitators is believed to be the most diverse and well-placed group of individuals from the geospatial, ESS, infrastructure and business communities ever assembled in the Twin Cities, this finding is thought to be a significant outcome of the event.

Recommendations: The following recommendations are offered:

1. In keeping with national and state standards that create regional interoperability, the IA identified in Activity 1.2 should develop geospatial communications standards that will include use of the U.S. National Grid whenever possible.
2. The IA should develop a program of outreach and education that facilitates acceptance and understanding of national geospatial standards among the region's geospatial and ESS communities.

Activity 2.3: Provide Incident Command/First Responder/First Receiver/Interoperable Communications

Observation 2.3: Area for Improvement. There is currently no regional plan for providing on-site geospatial incident support or mutual assistance.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComC 4.2.1: Communicate incident response information
2. ComC 4.2.1.1: Use established common response communications language (i.e., plain English) to ensure information dissemination is timely, clear, acknowledged, and understood by all receivers
3. ComC 4.1: Establish and maintain response communications systems on-site

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

There are four interlocking elements to this "emerging technology" observation:

1. The region has yet to develop a standard for facilitating the two-way flow of real-time geospatial information to/from a disaster site.
2. Despite the State of Minnesota at one time being a national leader in the concept of deploying GIS capabilities to the scene of a disaster (e.g., MN DNR MapMobile to the 9/11 World Trade Center Response), the region has never attempted to develop a similar capability.
3. In lieu of establishing GIS systems on-site, during the Red River Valley floods of 2009, members of the MnGeo Emergency Preparedness Committee are believed to be some of the first in the world to create a near real-time remote mapping capability for supporting a disaster response. This concept has also not been given formal consideration for use in the region.
4. As a way to mitigate a catastrophic loss of any specific local government's geospatial capacity during a disaster, geospatial mutual assistance agreements could be put in place between units of government in the region with similar technical capabilities. This concept has not yet been employed in the region.

Taken together, the above concepts represent significant ways to improve the two-way flow of geospatial information to/from a regional disaster site while at the same time enhancing operational redundancy.

Recommendations: The following recommendations are offered:

1. The IA identified in Activity 1.2 should develop geospatial communications standards that will facilitate the two-way flow of real-time geospatial information to/from the disaster site.
2. The IA should develop a plan for providing either a mobile GIS platform and/or a remote mapping production capability to support disaster responses across the region.
3. The IA should develop a regional plan to create local geospatial community redundancy.

Activity 2.4: Provide Emergency Operations Center Communications Support

Observation 2.4: Area for Improvement. There is currently no unified flow of real-time geospatial data that would facilitate creation of a regional Common Operating Picture (COP).

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComC 5.3.1.2: Coordinate and provide telecommunications and information technology support to Federal, regional, State, tribal, and local officials and the private sector(s)
2. ComC 5.4: Coordinate communications policy and procedure across response entities
3. ComC 5.3: Establish and maintain interoperable information systems network within the EOC
4. ComC 5.3.1: Coordinate placement of latest technology that is available to agencies participating in response
5. ComC 4.2.1.1: Use established common response communications language (i.e., plain English) to ensure information dissemination is timely, clear, acknowledged, and understood by all receivers
6. ComC 5.5: Maintain a Common Operating Picture (COP) for real time sharing of information with all the participating entities to ensure all responder agencies are working from the same information.

Analysis: This observation is offered on the basis of information collected during the Twin Cities GECCo.

A unified regional COP, or a data system that can effectively share real time geospatial data across numerous disparate viewing platforms, is needed for the region. Although the State of Minnesota has recently been working to create a COP to support its statewide responsibilities, to date there has been only a limited effort to create a similar approach

for use on a regional basis. While this situation is logical from the perspective that there is no such thing as a "regional EOC", reality is individual units of government need big picture understanding in any major disaster that has the potential to cross local jurisdictional boundaries.

Recommendations: The following recommendations are offered:

1. The IA identified in Activity 1.2 should develop a plan that will facilitate the sharing of data to support COPs in the Metro region.
2. In working partnership with the MetroGIS Work Group identified in Activity 1.1, the IA should develop a plan for geospatial architecture and/or data protocols that will support creation of COPs in the Metro region.

CAPABILITY 3: INTELLIGENCE AND INFORMATION SHARING AND DISSEMINATION

Capability Summary: As defined by the Department of Homeland Security Target Capabilities List:

The Intelligence and Information Sharing and Dissemination capability provides necessary tools to enable efficient prevention, protection, response, and recovery activities. Intelligence/ Information Sharing and Dissemination is the multi-jurisdictional, multidisciplinary exchange and dissemination of information and intelligence among the Federal, State, local, and tribal layers of government, the private sector, and citizens. The goal of sharing and dissemination is to facilitate the distribution of relevant, actionable, timely, and preferably declassified or unclassified information and/or intelligence that is updated frequently to the consumers who need it. More simply, the goal is to get the right information to the right people at the right time.

An effective intelligence/information sharing and dissemination system will provide durable, reliable, and effective information exchanges (both horizontally and vertically) between those responsible for gathering information and the analysts and consumers of threat-related information. It will also allow for feedback and other necessary communications in addition to the regular flow of information and intelligence.

Like most elements of the TCGECCo workshop, this capability was a self-graded item evaluated through group-discussions and event surveys.

Activity 3.1: Develop and Maintain Plans, Procedures, Programs and Systems

Observation 3.1: Strength. The Twin Cities Metropolitan Region has an exceptional advanced collaborative geospatial community that is open to the concepts of data sharing and process improvement.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComG 1.1.1: Identify all Federal, State, regional, tribal, and local stakeholders for inclusion in the information sharing framework
2. ComG 1.2.1: Develop information sharing network standards: survivable, interoperable, compatible, secure, accessible
3. ComG 1.4: Develop regulatory, statutory, and/or privacy policies

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

As one way to fulfill its charter as the regional planning and operating agency for the Twin Cities area, the Metropolitan Council created MetroGIS in the mid-1990s'. Since that time, MetroGIS has become a national model of geospatial collaboration and cooperation that has earned no less than five awards for operational excellence. It has accomplished this enviable record by faithfully fulfilling its assigned mission to promote and facilitate widespread sharing of commonly needed geospatial data and information among organizations that serve the Minneapolis-St. Paul Metropolitan Area. Consequently, the Twin Cities Region possesses a nationally unique geospatial community that understands the value of data sharing and process improvement.

Recommendations: The following recommendations are offered:

1. Every effort should be made to leverage this strength by using MetroGIS procedures and membership as the starting point for advancing future geospatial efforts that will be value added to the ESS equation.
2. As part of the planning envisioned in recommendations for Activity 1.1, 1.2, and 2.1, consideration should be given to using the proven strengths of the MetroGIS model to increase the sharing and exchange of geospatial data between the public and private sectors – particularly infrastructure related - to the maximum extent possible.

Activity 3.2: Incorporate All Stakeholders in Information Flow

Observation 3.2: Strength. The Twin Cities Metropolitan Region has an exceptional advanced public-private collaborative community (i.e., InfraGard) that is interested in facilitating the exchange of information for the public good.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComG 3.1: Share information and/or intelligence between Federal, State, local, and tribal levels by using clearly defined mechanisms/processes
2. ComG 3.1.2: Comply with regulatory, statutory, privacy-related, and other issues that may govern the sharing of information

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

As described on its web site, the mission of the Twin Cities Chapter of FBI's InfraGard program, "…is to enable the flow of information so that the owners and operators of infrastructure assets can better protect themselves and so that the United States government can better discharge its law enforcement and national security responsibilities." Indeed, the fact that the Twin Cities Region has one of the first, largest and best run InfraGard chapters in the nation (winner of the 2011 Homeland Security and Emergency Management (HSEM) Award of Excellence from the Minnesota Department of Public Safety) is a significant regional strength that can be built upon. Unfortunately, for many private entities, whether they are participating in the InfraGard program or not, willingness to "information share" generally does not include geospatial data. Often, geospatial data is viewed as proprietary, or of a nature that sharing would increase the chance of inappropriate use. However, the GECCo experience in other parts of the country strongly suggests that when private sector entities come to understand the limited scope of geospatial information that is needed to support regional ESS efforts, barriers are often quickly removed.

Recommendations: The following recommendations are offered:

1. As part of efforts related to recommendation for Activity 1.2, the IA should identify scope and depth of data required from private sector infrastructure owners to facilitate ESS operations. In addition, provisions for data safeguards should be recommended.
2. Based on the InfraGard model, the MetroGIS Work Group identified in association with Activity 1.1 should offer options for increasing the number of private sector infrastructure owners who would willing participate in efforts to share geospatial information.

Activity 3.3: Vertically Flow Information

Observation 3.3: Area for Improvement. There is currently no regional approach that facilitates the vertical flow of geospatial information during disasters.

References: See Appendix I for a complete list of references. Department of

Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComG 4.1: Share intelligence and information systematically between Federal, State, local, and regional entities in a timely manner
2. ComG 4.1.1: Disseminate relevant intelligence and/or information from Federal or State entities to local authorities in a usable format and in a timely manner
3. ComG 4.1.2: Provide relevant intelligence and/or information from local authorities to Federal or State entities in a usable format and in a timely manner

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

Events of recent years have demonstrated local or regional disasters may quickly become matters of national importance. In response to these events, the Federal government began developing Homeland Security Infrastructure Protection (HSIP) geospatial data sets shortly after 9/11. As conceived, these data sets are supposed to provide ESS and related communities with *a uniform and accurate* set of base layers of geospatial information across the United States. However, since State, regional and local entities have different geospatial capabilities, technical capacity, and willingness to "upstream/downstream" this information, quality of HSIP data sets is generally reflective of a top down collection effort managed by Federal contractors. Furthermore, even though efforts by MetroGIS and MnGeo have substantially facilitated the exchange of data between the Twin Cities regional and State vertical layers, in many cases geospatial data flows from the local level have not been optimum. Therefore, it is believed a comprehensive regional approach that facilitates a true two-way vertical flow of both static and dynamic geospatial information for ESS purposes is needed.

Recommendations: The following recommendations are offered:

1. In keeping with recommendations for Activities 1.2, 2.1 and 2.4, the IA should develop a vertically inclusive plan for a regional distributive network of static and real-time geospatial data of value to the ESS. Examples might include the Minnesota Structures Collaborative (MSC) for static data, and the Minnesota Department of Transportation (MnDOT) 511 System for real-time data.
2. In support of the recommendation above, the MetroGIS Work Group identified at Activity 1.1 should recommend a regional architecture and budget plan that will facilitate real time geospatial data flows from ESS personnel into data services that will support COPs in the Metro region as envisioned at Activity 2.4.

Activity 3.4: Horizontally Flow Information

Observation 3.4: Area for Improvement. There is currently no regional approach that facilitates the horizontal flow of geospatial information during disasters.

References: See Appendix I for a complete list of references. Department of Homeland Security, Target Capabilities List, Critical Tasks specific to this observation:

1. ComG 5.1: Adhere to horizontal coordination across jurisdictions among law enforcement and other appropriate agencies at all levels through effective and timely information sharing
2. ComG 5.1.1: Share intelligence and/or information across disciplines in a timely and effective manner
3. ComG 5.2: Structure dissemination and information sharing mechanisms so that private-sector entities receive accurate, timely, and unclassified information that is updated frequently and is consistent with their formal intelligence requirements

Analysis: This observation is offered on the basis of information collected during the TCGECCo.

Although the totality of collaborative efforts described in the preceding Activities clearly point to an environment where city, county and regional geospatial and ESS communities desire to work collaboratively to create horizontal data flows, in most cases geospatial data remains "siloed". This is particularly true with regard to any real-time data that might be available. In addition, there seems to be limited appreciation for the horizontally cascading impact infrastructure failures can have across sectors. For example, during a major disaster the oil and gas sector will need information about electrical outages so that it can ensure response crews have adequate fuel supplies (i.e., filing stations need electricity to work). Central to this lack of geospatial information technology enablement are the three core challenges that have also largely frustrated efforts to create a National Spatial Data Infrastructure (NSDI): Technology, People and Policies. Technology – is no longer the technical hurdle it once was when the NSDI was first envisioned in 1994 – it is now, however, a matter of Decision Makers deciding what system is going to be used for the region and who is going to pay for it. People - are only an "issue" to the extent Decision Makers fail to provide educational opportunities. Give practitioners *training* on the Technology and Policies and the horizontal walls that impede information exchange will come down. Policies – remain the most significant obstacle – without Decision Maker leadership that facilitates the horizontal exchange of endorsed geospatial data, cross compartment sharing of data will be deterred to the determent of the common good. Taken together, these points mean the only roadblock preventing the region from implementing a plan that will facilitate the horizontal flow of geospatial information is the awareness and engagement of Decision Makers. And if Decision Makers fail to become engaged on these issues in the near term, the delta between where things are now and where they will need to be to effectively employ available technology during future disasters, will only increase over time.

Recommendations: The following recommendations are offered:

1. Engagement by public-private Decision Makers on all levels is needed to ensure recommendations as offered in the preceding Activities are carried out. In that regard, ongoing engagement with organizational structures such as the MetroGIS Policy Board and the Twin Cities Urban Area Security Initiative (UASI) planning effort are thought critical to success. Therefore, MetroGIS should make known the existence of this report and the issues contained herein to regional executive level leaders through outreach efforts described at Activity 1.1 and 2.1. It is thought that Decision Makers will then have the necessary starting point for policy and guidance decisions to solve all preceding AAR/IP issues – thereby also solving those related to horizontal information sharing.
2. To the degree possible, MetroGIS and leadership of the region's ESS and infrastructure communities should work to expand engagement with each other.

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SECTION 4: CONCLUSION

In conclusion, the Twin Cities TCGECCo proved to be a substantial, high-quality, learning event that can serve as a springboard for improving geospatial processes supporting the region's ESS community.

Of note, the event determined the following strengths:

- The Twin Cities Metropolitan Region has an exceptional advanced collaborative geospatial community that is open to the concepts of data sharing and process improvement. (Activity 3.1)

- The Twin Cities Metropolitan Region has an exceptional advanced public-private collaborative community (i.e., InfraGard) that is interested in facilitating the exchange of information for the public good. (Activity 3.2)

- The Twin Cities Metropolitan Region has progressive Decision Makers on many levels who are willing to champion well defined programs that will facilitate the sharing of geospatial data and services. (Observed Behavior during the Decision Maker Event)

Of note, the event determined the following areas in need of improvement:

- There is currently no regional Implementing Authority (IA) that directs geospatial technology development for crisis and Emergency Management purposes. (Activity 1.1)

- There is currently no formal integration plan that addresses how geospatial technologies fit into local and regional command and control structures/organizations. (Activity 1.2)

- There is currently very little effort to formally incorporate geospatial capabilities into exercises conducted on the local and regional level. (Activity 1.3)

- There are currently no agreed upon legal or technical protocols for the region that facilitate the exchange and use of geospatial data in support of the Emergency Services Sector. (Activity 2.1)

- There is currently no regional standard for communicating location information by the Emergency Services Sector. (Activity 2.2)

- There is currently no regional plan for providing on-site geospatial incident support or mutual assistance. (Activity 2.3)

- There is currently no unified flow of real-time geospatial data that would facilitate creation of a regional Common Operating Picture. (Activity 2.4)

- There is currently no uniform regional approach that facilitates the vertical flow of geospatial information during disasters. (Activity 3.3)

- There is currently no uniform regional approach that facilitates the horizontal flow of geospatial information during disasters. (Activity 3.4)

In each case of deficiency noted above, it appears the collective regional community has a practical solution available to it. By following through with these solutions, the Twin Cities Region could become a national model for how geospatial information technologies can be employed to support the Emergency Services Sector.

APPENDIX A: IMPROVEMENT PLAN

This Improvement Plan (IP) has been developed specifically for the Twin Cities Region of Minnesota based on results of the Twin Cities GECCo Workshop conducted on October 27-28, 2011. Bold type indicates the applicable Section 3 origin of the respective Corrective Action.

Capability	Observation Title	Recommendation	Corrective Action Description	Capability Element	Primary Responsible Agency	Agency POC	Start Date	Completion Date
Capability 1: Planning	1. Conduct Strategic Planning	1.1. MetroGIS should convene a work group to develop a plan that identifies an Implementing Authority (IA) for the region.	1.1.1. MetroGIS creates work group to complete tasking as offered at **Activity 1.1, Recommendation 1**.	Planning	MetroGIS	Mr. Geoff Maas	Jul 1, 2012	Aug 31, 2012
		1.2. MetroGIS Work Group identified above should develop a plan for keeping regional executive level leaders informed of geospatial developments.	1.2.1. MetroGIS Work Group identified above develops geospatial developments communication plan for regional executive leaders. **Activity 1.1, Recommendation 2**.	Planning, Training	MetroGIS Work group	MetroGIS Work Group Chair (TBD)	Sep 1, 2012	Oct 31, 2012
	2. Develop/Revise Operational Plans	2.1. Upon designation of an IA as envisioned at Activity 1.1, IA should complete an overall needs assessment and corresponding plan to incorporate geospatial technologies into local and regional command and control structures/organizations	2.1.1. IA completes needs assessment and develops plan for incorporating geospatial technologies into local and regional command and control structures/organizations. **Activity 1.2, Recommendation 1**.	Planning	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013

		2.2. IA should develop a Standard Operating Procedures (SOP) document that addresses training and operational standards for geospatial technologies use.	2.2.1. IA develops Standard Operating Procedures (SOP) that sets training and operations standards for geospatial technologies use. **Activity 1.2, Recommendation 2**.	Planning, Policy, Training	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013
	3. Validate Plans	3.1. IA should develop plan to formally incorporate geospatial capabilities into exercises conducted on the local and regional level.	3.1.1. IA develops plan to incorporate geospatial teaching points and play into local and regional disaster exercises as part of the overall needs assessment plan developed at Activity 1.2, Recommendation 2. **Activity 1.3, Recommendation**.	Training	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013
Capability 2: Communications	1. Develop and Maintain Plans, Procedures, Programs, and Systems	1.1 MetroGIS should facilitate creation of legal and technical protocols for the region that allow the exchange and use of geospatial data in support of the Emergency Services Sector.	1.1.1 MetroGIS and State data practices authorities develop standard Memorandum of Understanding (MOU) for the exchange of geospatial data supporting the Emergency Services Sector. **Activity 2.1, Recommendation 1**.	Policy	MetroGIS	Mr. Geoff Maas	Sep 1, 2012	October 31, 2012

			1.2.1. MetroGIS Work Group develops recommended technical protocols to be used in conjunction with the MOU. **Activity 2.1, Recommendation 2**.	Planning	MetroGIS Work Group	Work Group Chair (TBD)	Sep 1, 2012	October 31, 2012
			1.3.1 MetroGIS should encourage champions from the decision/policy making community to join the planning process as soon as possible. **Activity 2.1, Recommendation 3**.	Policy	MetroGIS	Mr. Geoff Maas	Jul 1, 2012	October 31, 2012
	2. Alert and Dispatch	2.1. IA should develop geospatial communications standards that will include use of the U.S. National Grid whenever possible.	2.1.1. IA develops geospatial communications standards that include use of the U.S. National Grid whenever possible. **Activity 2.2, Recommendation 1**.	Policy	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013
			2.2.1. IA develops a program of outreach and education that facilitates acceptance and understanding of national geospatial standards among the region's geospatial and ESS communities. **Activity 2.2, Recommendation 2**.	Training	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013

	3. Provide Incident Command/First Responder/First Receiver/Interoperable Communications	3.1 The IA should develop geospatial communications standards that will facilitate the two-way flow of real-time geospatial information to/from on-site.	3.1.1 IA develops geospatial communications standards that facilitate two-way flow of real-time geospatial information to/from on-site. **Activity 2.3, Recommendation 1**.	Planning, Policy	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013
		3.2.IA should consider options for providing on-site geospatial support during disasters through either a mobile GIS platform and/or a remote mapping production capability.	3.2.1 IA develops plan for providing on-site geospatial support during disasters through either a mobile GIS platform and/or a remote mapping production capability. **Activity 2.3, Recommendation 2**.	Equipment	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013
		3.3 IA should develop a regional plan to create local geospatial community redundancy.	3.3.1. IA develops a regional plan for local geospatial community redundancy. **Activity 2.3, Recommendation 3**.	Planning	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013
	4. Provide Emergency Operations Center Communications Support	4.1. IA should develop a plan that will facilitate the sharing of data to support COPs in the Metro region.	4.1.1. IA develops a plan that will facilitate the sharing of data to support COPs in the Metro region. **Activity 2.4, Recommendation 1**.	Planning	IA	IA Chair (TBD)/	Nov 1, 2012	Jan 31, 2013

		4.2. MetroGIS Work Group should work with IA to develop a plan for geospatial architecture and/or data protocols that will support creation of COPs in the Metro region.	4.2.1. MetroGIS Work Group works with IA to develop a plan for geospatial architecture and/or data protocols that will support creation of COPs in the Metro region. **Activity 2.4, Recommendation 2**.	Planning, Equipment	MetroGIS Work Group/IA	MetroGIS Work Group Chair (TBD)/ IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013
Capability 3: The Intelligence and Information Sharing and Dissemination	1. Develop and Maintain Plans, Procedures, Programs and Systems	1.1. MetroGIS procedures and policies should be used as the starting point for advancing future geospatial efforts that will benefit the ESS.	1.1.1. Strength - MetroGIS procedures and policies should be used as the starting point for advancing future geospatial efforts that will benefit the ESS. **Activity 3.1, Recommendation 1**.	Policy	MetroGIS Work Group/IA	MetroGIS Work Group Chair (TBD)/ IA Chair (TBD)	Jul 1, 2012	NA
		1.2 MetroGIS model should be used to increase the flow of private sector geospatial data – particularly infrastructure related.	1.2.1. Strength - MetroGIS model should be used to increase the flow of private sector geospatial data – particularly infrastructure related. **Activity 3.1, Recommendation 2**.	Policy	MetroGIS Work Group/IA	MetroGIS Work Group Chair (TBD)/ IA Chair (TBD)	Jul 1, 2012	NA

	2. Incorporate All Stakeholders in Information Flow	2.1 IA should identify scope and depth of geospatial data required from private sector infrastructure owners to facilitate ESS operations. In addition, provisions for data safeguards should be recommended.	2.1.1. IA identifies scope and depth of geospatial data required from private sector infrastructure owners to facilitate ESS operations, and recommends provisions for data safeguards. **Activity 3.2, Recommendation 1**.	Planning	IA	TBD	Nov 1, 2012	Jan 31, 2013
		2.2. MetroGIS Work Group should offer options for increasing the number of private sector infrastructure owners who would willing participate in efforts to share geospatial information.	2.2.1. MetroGIS Work Group develops plan for increasing the number of private sector infrastructure owners who would willing participate in efforts to share geospatial information. **Activity 3.2, Recommendation 2**.	Planning	MetroGIS Work Group	MetroGIS Work Group Chair (TBD)	Nov 1, 2012	Jan 31, 2013
	3. Vertically Flow Information	3.1. IA should develop a vertically inclusive plan for a regional distributive network for static and real-time geospatial data of value to the ESS. Examples might include the Minnesota Structures Collaborative (MSC) for static data, and MnDOT 511 system as a starting point for real-time data.	3.1.1. IA develops a vertically inclusive plan for a regional distributive network for static and real-time geospatial data of value to the ESS. **Activity 3.3, Recommendation 1**.	Planning, Equipment	IA	IA Chair (TBD)	Nov 1, 2012	Jan 31, 2013

		3.2. MetroGIS Work Group identified should recommend a regional architecture and budget plan that will facilitate real time geospatial data flows from ESS personnel into data services that will support COPs in the Metro region as envisioned at Activity 2.4.	3.2.1. MetroGIS Work Group develops plan and budget for a regional architecture that will facilitate real time geospatial data flows from ESS personnel into data services that will support COPs in the Metro region as envisioned at Activity 2.4. **Activity 3.3, Recommendation 2**.	Planning, Equipment	MetroGIS Work Group	MetroGIS Work Group Chair (TBD)	Nov 1, 2012	Jan 31, 2013
	4. Horizontally Flow Information	4.1. MetroGIS should make known the existence of this report and the issues contained herein to regional executive level leaders through the outreach efforts described at Activity 1.1 and 2.1.	4.1.1. MetroGIS makes known the existence of this report and the issues contained herein to regional executive level leaders through the outreach efforts described at Activity 1.1 and 2.1. **Activity 3.4, Recommendation 1**.	Planning, Policy	MetroGIS	Mr. Geoff Mass	Nov 1, 2012	Jan 31, 2013
		4.2. To the degree possible, MetroGIS and leadership of the region's ESS and infrastructure communities should work to expand engagement with each other.	4.2.1. MetroGIS and leadership of the region's ESS and infrastructure communities work to expand engagement with each other. **Activity 3.4, Recommendation 2**.	Planning, Policy	MetroGIS	Mr. Geoff Maas	Nov 1, 2012	Jan 31, 2013

Table A.1 *Improvement Plan Matrix*

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APPENDIX B: LESSONS LEARNED

While the After Action Report/Improvement Plan includes recommendations which support development of specific post-exercise corrective actions, exercises may also reveal lessons learned which can be shared with the broader homeland security audience. The Department of Homeland Security (DHS) maintains the *Lessons Learned Information Sharing* (LLIS.gov) system as a means of sharing post-exercise lessons learned with the emergency response community. This Appendix provides jurisdictions and organizations with an opportunity to nominate lessons learned from exercises for sharing on *LLIS.gov*. The first four categories below have been organized to support that system.

Lesson Learned	
Applicable Learning Phase	**Definition:** Knowledge and experience, positive or negative, derived from actual incidents, such as the 9/11 attacks and Hurricane Katrina, as well as those derived from observations and historical study of operations, training, and exercises.
Planning, Training	For GIS to be of value during a disaster response, extensive planning must take place beforehand to prepare data, learn POCs, think through backup plans and do all the things traditional Emergency Services Sector personnel do to "be ready". If geospatial capability is not planned for, trained and improved through this type of engagement, a significant response force multiplier will not be available when needed.
Policy	A general lack of in-depth engagement between the geospatial and Emergency Services Sector communities means the policy and management structures required to produce the meaningful data flows needed to produce a Common Operating Picture are nonexistent. An Implementing Authority (IA) needs to be created at the regional level in order to bring together both communities in a manner that resolves these issues.
Training, Planning	Unlike many parts of the Emergency Services Sector, geospatial organizations are staffed for 8-5, M-F operations with no readily available local backups because of the technical skill level required by the work. Consequently, it is imperative that forethought be given to using Continuity Of Operations Plan (COOP) concepts for this community. Options include local collaborative networks, sister city arrangements, and/or creating certification programs that will facilitate FEMA funding of additional staff for local activities during disasters.

Training	Very few geospatial personnel have solid understanding of Emergency Services Sector organization and procedures. Furthermore, even fewer have command of national geospatial programs like HSIP, HIFLD, OneView, etc. that have been specifically developed to support the Emergency Services Sector. Thus, an expanded program of follow-on training based on the GECCo profile needs to be developed for the nation's geospatial personnel.
Best Practices	
Applicable Learning Phase	**Definition:** Exemplary, peer-validated techniques, procedures, good ideas, or solutions that work and are solidly grounded in actual operations, training, and exercise experience.
Planning	You never know when or where a disaster is going to strike. Consequently, geospatial leaders should maintain a copy of their employing entity's geospatial data base in a way that will allow geospatial product support for a local disaster to be delivered from a different location.
Planning	If electrical power is lost at the start of a disaster – the only geospatial products available are those items that have been prepared in advance. In other words, paper maps still have a place!
Planning	Disasters don't know political boundaries. Consequently, map products need to be developed in a standardized way so they can be interoperable. That way is the U.S. National Grid.
Good Stories	
Applicable Learning Phase	**Definition:** Exemplary, but non-peer-validated, initiatives (implemented by various jurisdictions) that have shown success in their specific environments and that may provide useful information to other communities and organizations.
	None reported for this event.
Practice Note	
Applicable Learning Phase	**Definition:** A brief description of innovative practices, procedures, methods, programs, or tactics that an organization uses to adapt to changing conditions or to overcome an obstacle or challenge.
	None reported for this event.

Table B.1 *Lessons Learned Matrix*

APPENDIX C: TABLE TOP EXERCISE (TTX) OBSERVATIONS

In contrast to the Lessons Learned Appendix which features overview items derived from the entire Geospatially Enabling Community Collaboration (GECCo) event, the scope of this Appendix is limited to participant comments made during the Table Top Exercise. Those comments are provided below for attendees who would like to use them as memory joggers for their post event improvement efforts. The evaluation team makes no assessment as to the accuracy of the comments offered.

Table Top Exercise (TTX) Observations

Definition: Spontaneous thoughts offered by team participants during the event.

Applicable Learning Phase	Question	Team	Comments
Preparatory Phase	How does your organization's GIS capability get "geared up" for an event?	Fox	• Ensuring I know where GIS neighbors are at, and if they are able to respond with GIS support. • Which organizations and which people? Identifying key organizations and personnel
		Golden	• Having GIS data ready • Plan and run plans, prepare geocoding data, transform data, ready to go • NWS 24 staffing 4-5 extra people – planning on extra people handle extra WX
		Leopard	• MnDOT prepare months ahead of time – 511 - routine in springtime • Info on-line available • Talking to GI staff plan • Who is around? • USB drives - backup drives • Operations center? Preparations • State EOC – ramped up by MnGeo; Schedule issued for 24/7 personnel • What does our own house look like? Can you be gone? • Checking supplies equipment

			• Broad brush – make sure we have available data
		Tokay	• Prepare ahead with flood forecast; look at levee data and add to USNG maps (Jan – Feb) • Find "excuses" to meet ahead of time • Cue providers for post-event imagery & damage estimation
	Who is involved in the preparation?	Fox	• Common contact list, emails, etc. • Paper based run throughs, followed by scenario based run throughs • Direction from HSEM to coordinate with GIS offices affected
		Golden	• Maps! • Prediction of events; weather, data models
		Leopard	• Military – ANG personnel available – available location, where, when • Support to families • Provide staffing to joint ops center • What is everyone else is doing?
		Tokay	• Public works – plan for floods ASAP – changes in floodplain; address what ifs – loss of power, water intakes flooded, etc. – get the GIS people working NOW • Coordinate with all regional entities – may have multiple Federal regions
	What challenges do you and your organization face?	Fox	• Ensure that equipment is up and running • Backup power in case of outage or plans for no power • Ensure interoperability of software/hardware • Have access to updated weather models
		Golden	• How do you know when to spin up? (EOCs State, local) • Having data on hand that every agency can use • Preparation of data • Timelines for different events • Duplication of effort – what is the division of labor across agencies?
		Leopard	• Emergency Management background limits understanding of GIS support • Our GIS feeds into/out of state

			• Definable objectives/sharing challenges
		Tokay	• How to allocate resources; who are the contact people? Get this done ahead of time. • Share utility maps ahead of time; are they updated? • State & county – who are the short term resources for events like tornados?
	What key data sources do you rely on and attempt to compile in advance? In what formats?	Fox	• GIS prepared to support incoming outside assistance • Basic transportation map with USNG • Basic services of police, fire
		Golden	• Maps! • Prediction of events; weather, data models
		Leopard	• WX mapping system? • Water levels • Know when water levels get too high, flood levels few hours of closure • Road closures – reports? Bridges down?
		Tokay	• HSIP data (OneView) useful both before and after • Get immediate info from weather service
Immediate Response Phase Incident # 1	What is your initial response to a multi-jurisdictional incident?	Fox	• All EOCs would eventually become a unified command as this escalates to regional response. • Contact Xcel to know find where the power lines are down • Request Xcel shutdown local grid, for safety • Establish road blocks
		Golden	• Maps – search and rescue • At least two counties affected • What systems have been affected? GIS personal mutual aid….
		Leopard	• Excel Power re-route system available to all available lines • Everyone is rolling to affected areas • Need to know what is passable and what is not • MnDOT provides what's open and what is not • 511 State patrol inputs

			• People are on – look for congested area on map shows in red • Dispatch happens pretty quickly • All Excel crews mobile data terminal – maps radio comm routing compatibility without software • What going on at local level • NWS most of our planning is done before tornado touches down • Excel - Pay attention to weather not caught flat footed • Internally assess what has happened – is there more weather coming, what do we need to do?
		Tokay	• Contact utilities; prioritize repairs following damage assessment • Who's in charge?? • Address ability to operate in event of power loss/damage • Decide how major players (e.g., counties) will share duties & data; how will it be collected & disseminated
	What tools can your individual organization provide to support the response?	Fox	• Additional GIS resources would be directed to Hennepin County • Push out maps to EM teams for navigation
		Golden	• 1st set of maps First responders, big picture, where the tornado went, first target are use polygons • 2nd Power outage maps – Life and safety risk
		Leopard	• Dakota County available if you need help (other counties) • ANG we provide response – limited – local; community has to be tapped in first – perception that ANG can move in – has to requested by community then governor - Call ANG duty office • Share GIS • Carver County local response hands off until city requests • MnDOT has to be official – but would verity • Excel – not a showstopper – would evaluate
		Tokay	• Sharing of resources – communicate to make this happen • Offer support if in other jurisdiction • Put up damage maps on website if feasible

			• Info for right of way clearance • Info for police to identify areas that should be closed off
	What capabilities are you aware of that are supported by other organizations?	Fox	• Xcel pushes GIS information to the EOC to assist in initial assessment
		Golden	• GIS personal mutual aid
		Leopard	• No answer
		Tokay	• Utilities – can they provide outage data (shapefile from meter data, e.g.) • How to communicate to public (radio, text message, or ????) • How to communicate among gov't entities? • Is there a mobile response asset?
Immediate Response Phase Incident #2	Where would you get your information about this event?	Fox	• Communications with MSP & MOA • Use MnDOT cameras to assess damage along 494 • Contact Bloomington Fire/PD • MAC and MNNG response • Monitor tweets based on search criteria to locate where incidents are occurring - ESRI tool
		Golden	• Possible movement to local EOC • How accurate is our data to provide maps… truth in data • Fire departments and police department involved • Ham radio operators
		Leopard	• Transit control center • NWS • Monitoring CNN etc. First thing GIS staff to check preparations emergency • Excel – as destruction takes place all this is recoded in our center • GIS - print maps • Lakeside – assess our staffs • MnDOT provide traffic control – our function – where do we need to go evolving GIS functions • Local news, boots on ground trained observers

			• Channel trough incident command • Communication ANG bricks • Carve exclusion zones created – police fire • Excel create outage paths – OMS
		Tokay	• Info – weather service/NOAA; cell phones; • Different levels of gov't have different data – who will compile; will there be assistance from higher levels?
	Would you anticipate getting a call from an Incident Commander to be part of an Incident Management Team to respond to this event?	Fox	• Cell phone towers might be overloaded
		Golden	• Do we call and offer assistance…
		Leopard	• Three people excepted to get call • Radios is how we get info from ground people • What about interoperability and joint communication? • How do we get information? • Concerned about silo communications
		Tokay	• Incident commander – when is the call made? Should you start work ahead of time? How does your organization mobilize after getting the call? • Contact EOC --- focus on who can do what
	What critical information and capabilities would you be prepared to provide?	Fox	• USNG coordinates for MSP and MOA damaged areas • Plumes from the burning fuel tanks? Need infrastructure of the storm sewer
		Golden	• Quick map for first responders
		Leopard	• Temporary shelters
		Tokay	• Would you send people off-site/bring people on-site to facilitate data creation/sharing? • Federate work out to other cities/counties that are willing to help? (some called this "reachback"). Think of this as using the cloud. BUT – will bandwidth be available? • At some point -- can data resources be centralized? At what point is this a good idea?

			• Use DisasterLAN to see what coordination is being done and what data is being shared there already.
Immediate Response Phase Incident #3	What core geospatial capabilities are available that you can rely on during major power outages?	Fox	• Contact alternate EOC center adjust operations to New Brighton • Rely on paper maps to direct responders
		Golden	• Pre-printed maps • Transfer of data to another working EOC • Pull from Cloud EOC?
		Leopard	• Power lost at MnDOT down town and at Waters Edge • Excel – our people would have our mobile data terminals what track types • MnDOT trucks still work • Very serious situation we are on our own coordinating with GIS staff trying to get something common over long haul • Hennepin County gone in this scenario • Dakota County talking to cities for backup • ANG wondering states of location of emergency response personnel where are they? Communications? • Following own channels – from GIS people we can do backing help
		Tokay	• Take work out to area with power? • Is there a plotter available – get maps out to responders? • Emergency generator/ off-site backup locations? Mobile CP? • Any way to control where power is restored first (e.g., can EOC, etc. have priority?)
	What are the essential data layers required by emergency responders at this point, and at what level of granularity/detail?	Fox	• Critical utilities • Responder locations • At risk populations • Critical locations - hospitals • Damage assessment • Critical infrastructure
		Golden	• Streets, buildings, key infrastructure, hospitals

		Leopard	• Roads, Facilities, Addresses, Open sites, Command posts – hospital • Recce available • Entry control points • Situational awareness weather coming forecasting? • ANG EOC providing support • Excel would not probable know • Need to report to not incident commander • ANG available responses – communications • Each county has communications • GIS support are we going to
		Tokay	• Need all infrastructure, utilities, public buildings; critical resources;
	Is there a common operating picture that you can consume and contribute to?	Fox	• Rely on information feed from active EOCs • Complete reliance on portable radios now • Transfer information if possible to paper maps
		Golden	• Pre-printed map books - US National Grid • Laptops with maps • Task available assets to receive a clear picture of event
		Leopard	• Do we have one • Backups are gone • Relying on our use – located GIS person in EOC would pay attention to what going on • Paying attention to what happened • GIS liaison try to capture • No common operating pic would have to be coordinated
		Tokay	• Can you use Google earth? • Find out who has power and has copied data from sources like MnGeo • 800 mHz radio system – is there a similar resource • Most folks have an EOC – can information go both ways? Makes it hard to develop a COP. What level of gov't will maintain/share COP?

			• Some first responders have satellite phone; can this be leveraged?
	Do you have ready access to contact information for your colleagues in other organizations?	Fox	• No answer
		Golden	• Text message to other colleagues (small data package to ping towers)
		Leopard	• Would have to be coordinated • Common available to public is it government only?
		Tokay	• Use your contact lists, but are they up-to-date and are the people reachable? • Worries about duplication of efforts • Need to have a plan for who deploys where/when
Extended Response Phase	What capabilities can you provide to support the efforts of the Emergency Response and Infrastructure Communities?	Fox	• Identify vacant properties and add to the low priority list • Identify locations of retail stores that can provide bottled water • Maps for supporting EM personnel in the field • Road closures • Active gas stations • Aid stations • Distribution centers • Identifying how to track non-native assistance assets • How do we receive and translate incoming information to place in our maps • Utility locations
		Golden	• Multi-customers that will need specific maps
		Leopard	• 24-36 hours what capabilities do we nave – same capabilities taking about maps
		Tokay	• Locations of emergency materials/water/food stockpiles (Target/Wal-mart) • Products to identify where water supply restored • Maps of damage assessment & mitigation processes • Road/street closure (MnDOT does not provide local info)
	What tools can you rely on under major power outages?	Fox	• Request imagery, then how do you distribute this?
		Golden	• Media – use of social media provide locations of shelters and food • Emergency Broadcast system to provide information

		Leopard	• Paper maps – people • Electronic maps offloading • No power no gas • Life is tough this is bad • Vehicles as long as they have gas • Generators – can get portable generators • Where are we going to get info about? • Emergency Management – communication • How do we get info? • People on bikes with maps • Responses shift situation – could hand out maps • ANG partners • EOC will need in-depth maps
		Tokay	• Paper maps & pencils = reliable technology, until printers available • Is there a standard damage assessment map format – look at Dakota County maps for examples
	Where are you going to get your information about the event?	Fox	• No answer
		Golden	• Runners with thumb drives • Collaboration in cloud
		Leopard	• Contact with partners – if I contact GIS people in Eagan can do better • Can we get info to our partners? • National news • People will have to rely on immediate reporting people?
		Tokay	• Information sources – will they flow through supervisors or EOCs (or both) • Will EOC have capabilities for propagating information • How is responsibility assigned? • How will data flow into the central EOC or CP?
	How will you provide your	Fox	• Radios 800 MHz • Allocate resources to monitor radios

	information to responders?	Golden	• Print and thumb drives • Map books into the hands of first responders
		Leopard	• Relying on partners • All using the same system • Remote access • People would have to go home to work • Not sure how – check with LOGIS (?)
		Tokay	• Paper mapbooks or PDF map books • How to add data to the basemap – overlay or create multiple hard copies?
Recovery Phase	Would you be able to sustain double shifts, 7 days a week, with your current personnel?	Fox	• Unable to sustain operations, unless tapped into the neighborhood
		Golden	• Asking for support from other GIS personnel (GIS neighborhood) • State support through contracts from private sector
		Leopard	• Some of us – others not so much • Just the geospatial services - Relying on partners • Don't think we would not have enough staff would have to work with Eagan would have to hook in with ITS – whose planning director GIS people at cities and counties to tap into • People management issues • Trying to do GIS management issues – try to manage issues • Excel – People would have to go home to work • Excel ask for volunteers • ANG Emergency Response team. GIS suggests pulling people from these teams • Most likely agencies would have to help we would probably not be able to sustain ops for this length of time
		Tokay	• Need $$ to fund 7 day a week ops; can you assume FEMA/Fed $$? • Will need outside help to fund extended operations (people)
	What capabilities could you provide that would	Fox	• Ensure that each responder, volunteer has a map • Ensure that all the data is rolled back in and used in the future, mitigation

	assist long-term cleanup efforts?	Golden	• Staging areas - both to start from and storage • What's been cleared (area), what has not • Hazardous home material • Aerial Photos / high resolution satellite
		Leopard	• Data • Maps
		Tokay	• Work will largely be status mapping • Predict or assess contaminant migration & sources? • Data for managing logistics of recovery – get it to workers • Data for managing volunteer needs & operations – where to put these resources?
	How can you collaborate with your colleagues in other organizations to provide support?	Fox	• MnGeo looks promising, able to share information • Local community with open source GIS capabilities • Meals/lodging • Volunteer Force
		Golden	• GIS not type sourced in MICS – how do you request? • (As a note half of our group did not have ICS training)
		Leopard	• Situational overlays communicate with our partners • ANG – really important to communicate with EOC
		Tokay	• Need to share processes/methods! Develop standards so communities can more easily share data

Table C.1 *Table Top Exercise Observation Matrix*

Note: Observations as recorded on team easels are available as a PowerPoint that can be downloaded from the TCGECCo website.

APPENDIX D: PARTICIPANT FEEDBACK SUMMARY

Three types of formal surveys were completed during the Twin Cities GECCo. Under each major heading, find a brief description of the poll type and method, followed by the results.

1. ELECTRONIC AUDIENCE REACTION POLLING

Overview:

The Twin Cities event was the first time Electronic Audience Reaction Polling (EARP) was used during a GECCo. In application, the audience was able to provide feedback to a limited number of questions using the Poll Everywhere system which utilizes the texting feature of cell phones to answer questions. Although this effort was considered experimental, reactions to the four questions asked during the afternoon of the first day are provided below:

Figure D.1: *USNG Awareness*

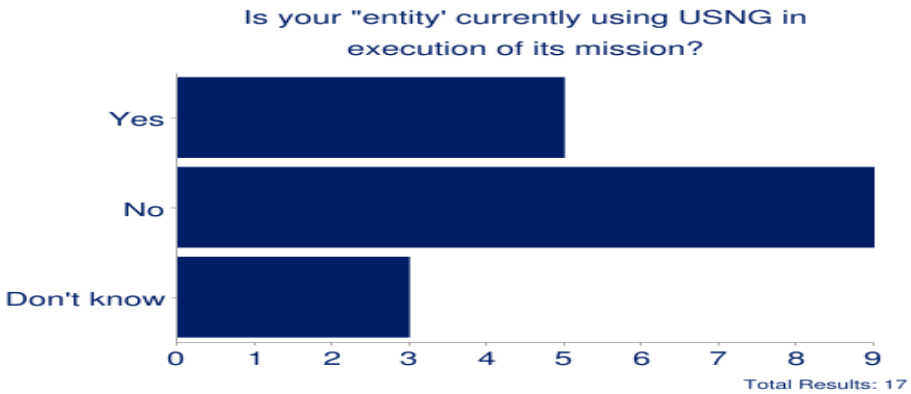

Figure D.2: *USNG Use*

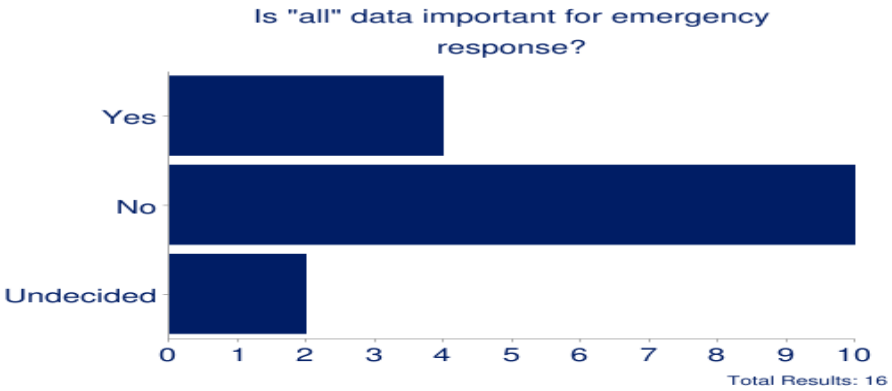

Figure D.3: *Geospatial Data Importance*

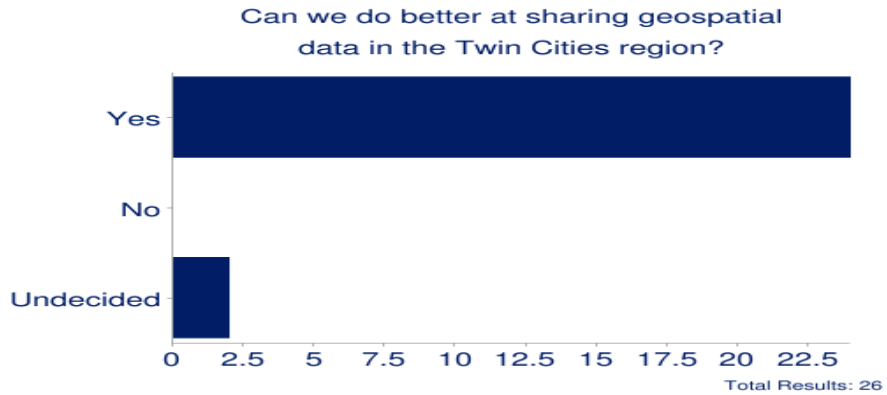

Figure D.4: *Geospatial Data Sharing*

Observation:

Of note was the effect previous USGS-sponsored training about the U.S. National Grid had achieved as nearly 100% of workshop participants were aware of its importance and use. This is more than double the level of awareness found during previous GECCo events where no USNG training had occurred beforehand. The data question responses were also noteworthy in that a majority felt geospatial data could be "cherry-picked" in support of the Emergency Services Sector, and that an overwhelming majority felt the Twin Cities Region could be doing a better job of sharing geospatial data.

2. Mid Event Topic Survey

Overview:

On the evening of day one of the event, participants were asked to complete an online survey of questions that had been selected by the event planning committee after reviewing 150+ Lessons

Learned items that had been previously identified during previous GECCo events (review of these items is available at: http://sites.google.com/site/tcgecco/home, by using the "Event Packet", "Comments and Lessons Learned From Past GECCos" link). The questions drawn from these issues were designed to determine what the group thought the most important goals were for improving delivery of geospatial capability supporting the Emergency Services Sector in the short term (practitioner driven issues), and in the long term (Decision Maker driven issues). Respondents were then asked to rate how easy or hard they perceived accomplishing these goals would be. In effect, the intent of the survey was to identify "low hanging fruit" that could improve operational capacity in the Twin Cities Region with the least effort. This was accomplished by adding together the importance and ease factors to create a combined breakout score. Results are shown below for the top five answers, short term responses are shown first:

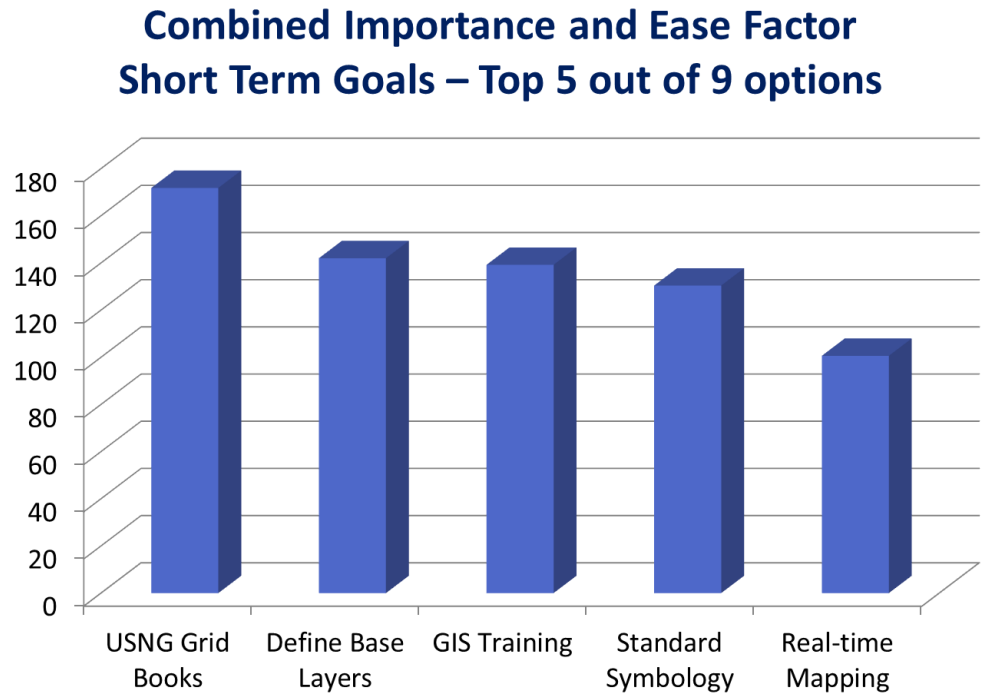

Figure D.5: *Top Short Term Goals*

1. Create U.S. National Grid (USNG) map books for the entire Twin Cities Region.
2. Define which base layers of information should be shared across the Twin Cities Region for proposes of emergency preparedness and response.
3. Incorporate geospatial training and personnel into Emergency Services Sector exercises.
4. Define symbology standards for emergency preparedness and response mapping in the Twin Cities Region.
5. Develop real time data sharing across sectors based on the MnDOT road closure application model.

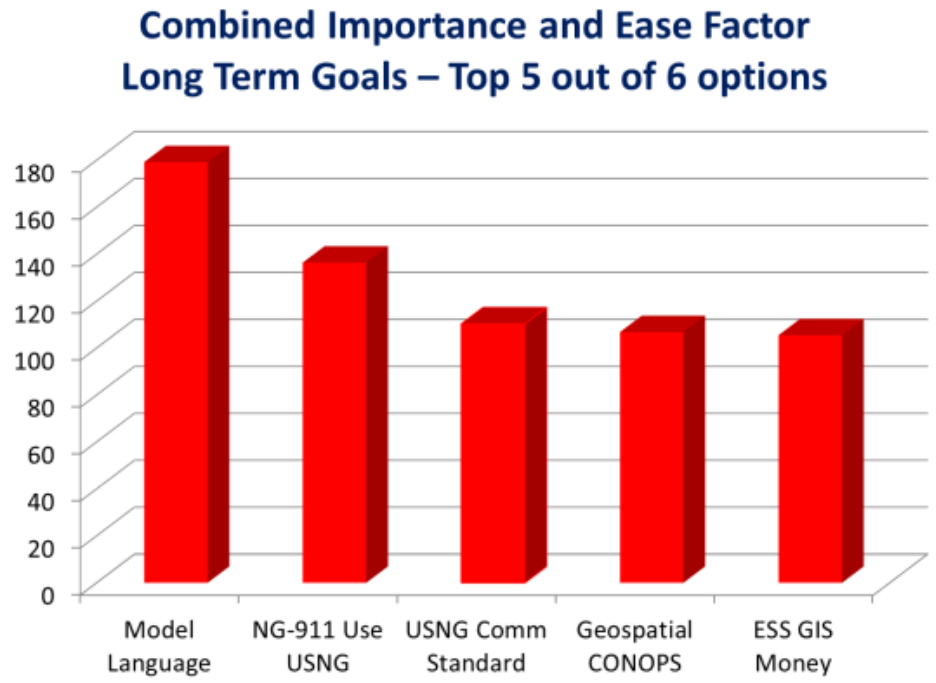

Figure D.6: *Top Long Term Goals*

1. Draft model language that will allow State and local policy makers to remove legal restrictions on geospatial data sharing
2. Require all NG-911 systems in the Twin Cities Region to have USNG functionality as a core component (It is understood this question is not technical correct since USNG cannot be integral to NG-911 core functionality. However, respondent feedback indicates this item was understood as intended – future Computer Aided Dispatch (CAD) systems would have USNG as a selectable coordinate system for core features (i.e. dispatch to a location)
3. Implement USNG across the entire Twin Cities Region as the Emergency Services Sector geospatial communication standard
4. Develop a Geospatial Concept of Operations manual for the Twin Cities Region that coalesces the above concepts
5. Define opportunities for the Emergency Services Sector to apply for funding that will advance use of geospatial technologies in support of their operations

Observation:

To the degree it was reasonable to do so, items as identified by these surveys have been incorporated into the detailed recommendations coming out of this GECCo. However, some of these items should become part of the needs assessment conducted by Implementing Authority (See: Activity 1.2, Recommendation 1).

3. EVENT SATISFACTION SURVEY

Overview:

At the conclusion of the event, participants were asked to provide feedback about their overall satisfaction with the event. The form below was used for this survey:

Homeland Security

gita

WORKSHOP EVALUATION

Geospatially Enabling Community Collaboration (GECCo)

October 27-28, 2011

Your rating of your experience participating in this workshop would be greatly appreciated by the sponsors. Please complete this form and drop it off at the registration table as your leave. Thank you.

Please check the box to the right of each of the following questions that best describes your experience:

	Poor	Average	Good	Outstanding
Was this Workshop.....				
1. A valuable use of your time / relevant to your job responsibilities?	[ ]	[ ]	[ ]	[ ]
2. Useful in providing new and valuable information and ideas?	[ ]	[ ]	[ ]	[ ]
Your Understanding of the Workshop Objectives:				
1. Prior to the Event:	[ ]	[ ]	[ ]	[ ]
2. After to the Event:	[ ]	[ ]	[ ]	[ ]
Effectiveness of Major Workshop Activities:				
1. Presentations and Panel Session (*Current Situation*)	[ ]	[ ]	[ ]	[ ]
2. Table Top Exercise (*Visualize Opportunities for Improved Effectiveness*)	[ ]	[ ]	[ ]	[ ]
3. Keynote Address (*Rapid Advancement in Geospatial Technology – What Every Policy Maker Needs to Know*)	[ ]	[ ]	[ ]	[ ]
4. Next Steps (*Relevance to Your Needs*)	[ ]	[ ]	[ ]	[ ]
Adequacy of Facilities:	[ ]	[ ]	[ ]	[ ]

Please identify one thing, which if achieved, would make this event a major success:

_____

Additional Comments: (*use the back of this page if more room needed)*

_____

I am interested in lending a hand with next steps defined at this GECCo workshop:
Yes No If yes,

Name: _____

Organization: _____

Phone Number: _____ Email: _____

If you would like to be included on the MnGeo Emergency Preparedness Committee's mailing list and/or wish to participate on this Committee, please contact Steve Swazee, EPC Committee Chair at 612-239-6981 or sdswazee@sharedgeo.org.

Figure D.7: *Workshop Evaluation Form*

Responses from for the ratings section of the survey broke out as follows:

QUESTION (# Responses)	Poor	Average	Good	Outstanding
Was this workshop…				
1. A valuable use of your time/relevant to your job responsibilities?			**50% (22)**	**50% (22)**
2. Useful in providing new and valuable information and ideas?			45% (21)	**55% (24)**
Your understanding of workshop objectives				
3. Prior to the event	4% (6)	**44% (20)**	40% (18)	2% (1)
4. After the event		4% (2)	47% (21)	**49% (22)**
Effectiveness of major workshop activities				
5. Presentations and panel sessions		4% (2)	41% (18)	**55% (24)**
6. Table Top Exercise	2% (1)	14% (6)	**55% (24)**	29% (13)
7. Keynote address		9% (4)	41% (18)	**50% (22)**
8. Next steps (relevance to your needs)	2% (1)	14% (6)	**70% (30)**	14% (6)
9. Adequacy of facilities		10% (4)	40% (16)	**50% (20)**

Table D.1 *Participant Survey Results Matrix*

Observation:

Significant survey findings are as follows:

- General understanding of available programs and the need for collaboration among those present increased from 48% having "poor" or "average" understanding to 96% having a "good" or "outstanding" comprehension of the workshop objectives.

- Overall effectiveness of the workshop, as indicated by questions 5-8, was rated either "good" or "outstanding" by 89% of the audience.

- All thought that the TCGECCo workshop did at "good" or "outstanding" job of providing new and valuable information and that it would be useful in their performance of their work-related responsibilities.

Similarly, verbal polling indicated broad awareness about Infrastructure Information Collection Division (IICD) programs, but little to no hands-on experience. The latter finding strongly suggests that during a time of crisis/conflict, local and regional geospatial professionals will be reluctant to use the Homeland Security Information Network (HSIN), Homeland Security Infrastructure Protection (HSIP) data, and the Automated Critical Asset Management System (ACAMS).

Written Comments

Question: Identify one thing, which if achieved, would make this event a major success? Answers (grouped by general categories):

Collaborative Efforts/Networking

- Networking is key
- Placing names with faces in our rapid response community
- Collaborative involvement at EPC meetings, MN GIS/LIS, Esri UC, etc.
- More planning and formal establishment of a group to move forward
- Continuing and recurring meetings of this group
- The spatial community embracing a federated data and service sharing method supported by a regional, State and Federal governance structure

Data Sharing Comments

- Increased data sharing
- Identified data requirements and needs; a data delivery mechanism, including security and access
- Increased access to public GIS datasets

Decision Makers/Policy

- Educate and get buy-in from Decision Makers
- A needs assessment gets completed
- A requirements definition process and governance structure to define standard critical infrastructure mapping products
- A modified Data Practices Act in the statutes
- Legislation is most important
- An authoritative agency for moving forward, as well as funding mechanisms (at least for the basics)
- A 'convening' authority to adopt recommendations and next steps
- Determining individuals who are responsible for key tasks going forward
- Development of the 'one page' everyone could get on
- Clear plan for government agencies to work together – determine who does what, and how do we find out what's going on?

- I feel that developing a CONOPS would be a huge benefit to this community. With all that can be done from the geospatial side we need to define the roles and tasks of State and local GIS personnel to reduce confusion and focus effort.
- Better COP statewide with a continuation of the ideas and goals of the exercise

ESS Buy-In

- Greater incorporation of first responders (local boots on the ground) to this initiative
- Need more police and fire personnel (field people) to be involved

USNG Comments

- Adoption of the USNG by State, county and local governments
- Statewide USNG base map
- Implementation of USNG by the region for emergency response
- We all are using USNG by Spring 2012
- Statewide geospatial templates based on USNG, not PDFS
- Institutionalization of USNG in Emergency Management
- An ability to show up at a disaster scene and communicate location information using USNG

Miscellaneous

- Better understanding of GIS systems and capabilities
- Gave me lots of things to work on with my emergency manager
- Our own ability to print maps on the scene
- Enduring employment

Opportunity to Provide Other Comments (Items for DHS/GITA Event Improvement are Contained in a Special Addendum):

- This is a GIS/emergency response event and I'm thinking it might be of benefit to include some individuals and organizations that are targeted organizations – petroleum and oil/gas providers. If we don't have gasoline/fuel our trucks and vehicles are not going to move. What sort of GIS plans do we have for these industries?
- Medical GIS planning and emergency response folks are directly involved – what are their GIS plans?
- What is the law enforcement GIS plan?
- I hope we can keep moving forward now that the meeting is over.
- HSEM was a missing component. Additional clarification and education on ICS implementation within MN specifically – ie: SEOC, MNICS, Regions, etc.
- This was the first time I've spent in a room of fellow GIS'ers in 15 years!
- Transportation – I'm thinking that the MAC, highways, etc., should be here. (Editor note: Both MAC and MnDOT were represented at the event)

APPENDIX E: MEETING AGENDA

Homeland Security

Twin Cities
Geospatially Enabling Community Collaboration (GECCo) Workshop
October 27 and 28, 2011

gita
GEOSPATIAL INFORMATION & TECHNOLOGY ASSOCIATION

Location: Fort Snelling Officer's Club, State Hwy 5 & Post Rd, Saint Paul, MN 55101 (Just south of the Minneapolis-St. Paul International Airport, at the Fort Snelling State Park entrance)

Sponsors: The Geospatial Information and Technology Association (GITA) and Department of Homeland Security (DHS)

Admission: Event is ***free***.

- Registration is by invite only *until* Noon on October 10th
- First come, first serve, *after* Noon on October 10th
- Event registration site: http://www.eventbrite.com/event/2176516018

Workshop Goal and Objectives
Workshop Goal: To build on the experiences and knowledge gained from previous local and regional efforts in the greater Twin Cities area in order to further examine and begin resolving collaboration and geospatial information exchange issues that inhibit effective critical infrastructure protection, and emergency preparedness and response.
Workshop Objectives: ▪ Explain and document local geospatial constraints that could hinder disaster/emergency responders. ▪ Within the context of defining how the geospatial community can assist the emergency services sector: o Identify local initiatives and resources and discuss how to improve the flow of information and data among Federal, tribal, state, regional, and local data resources and stakeholders. o Gain an understanding of the geospatial programs, tools, methods, and data available from the Department of Homeland Security (DHS) for helping infrastructure managers, first responders, emergency managers, and homeland security officials. o Gain an awareness of geospatial standards and resources currently used by the disaster/emergency response GIS and remote sensing communities of practice. o Enhance understanding of Geospatial Information Technology (GIT) as a key tool for supporting critical infrastructure protection and emergency management and their interdependencies. o Examine data sharing and collaboration issues and opportunities among public and private infrastructure owners (governments, utilities, first responders, etc.). o Benefit from GITA's Geospatially Enabling Community Collaboration (GECCo) program body of knowledge from previous GECCo workshops in other regions, including how to turn data into actionable information for responders and decision makers at all levels and areas of interest. ▪ Define actionable next steps for improving collaboration, information exchange, and data quality/format needs to support more effective infrastructure protection, and emergency preparedness and response.

Workshop Agenda	
Thursday, October 27, 2011 (Practitioner Focused Day)	
8:00 am	**Registration, Light Continental Breakfast, Networking**
8:30 am	**Welcome and Introductions** – Bob Samborski, Executive Director, GITA • A brief introduction to the history of the program and acknowledgement of special guests

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8:45 am	**Why Are We Here?** – Talbot Brooks, GECCo Facilitator, Center for Geospatial Information Technology, Delta State University, Cleveland, MS • Geospatial collaboration issues impeding effective response, • How these issues impact our nation's ability to protect critical infrastructure and respond to disasters, and • How geospatial technologies can improve all four phases of the emergency management cycle.
9:30 am	**Interdependencies of Infrastructure** – Dave DiSera, GECCo Lead; Member National Geospatial Advisory Council; EMA, St. Paul, MN • GECCo overview • Our nation's increasingly interdependent infrastructure and its relationship to modern society, • The impacts of single and cascading infrastructure failures, and • Geospatial information as critical infrastructure. (90 minute GITA background block is now complete)
10:15 am	**Break**
10:30 am	**DHS's Federal and Regional Efforts** – Scott Bailey, HIFLD to the Regions, Chicago, IL This presentation will cover the tools that NPPD/IP provides to federal, tribal, state, regional, and local governments for the collection, management, and visualization of infrastructure data to support national preparedness, response, and recovery efforts. As well as: • Information Exchange Broker (IEB) and HIFLD to the Regions (HTTR) roles and responsibilities • Homeland Security Infrastructure Program (HSIP) Gold and the various versions • DHS geospatial efforts in the Great Lakes
11:30 am	**A Brief Overview of Civil Air Patrol Capabilities** – Capt. Nash Pherson, Minnesota Wing, Civil Air Patrol • An often overlooked remote sensing capability that is available for Minnesota emergency planning and response efforts of all sizes • Activated and Federally funded as part of every major disaster (90 minute Federal background block is now complete)
Noon	**Networking/Working Lunch** • Seating shuffle for lunch • 12:20-12:50 PM – **"Standards"** - Talbot Brooks, U.S. National Grid Federal implementation grant holder: For geospatial information to be of value to the Emergency Services Sector, it must conform to standards the same way the rest of the sector does (NIMS/ICS).

1:00 pm	**Local Challenges and Issues** – Six timed presentations based on a common template, from three core communities (Infrastructure, Emergency Services (ES), Public Service): • A brief overview of the organization, • Examples of how the organization currently uses geospatial technology, • Challenges, issues, successes when it comes to providing geospatial information to/from others – particularly the Emergency Services Sector, and • What data/capabilities can the organization share with others – right now?
1:00 pm	**Infrastructure Presentation Number 1** – Paul Weinberger, MN Department of Transportation
1:20 pm	**Infrastructure Presentation Number 2** – Bob Basques, City of St. Paul Public Works
1:40 pm	**ES Presentation Number 1** – Dan Anderson, Hennepin County Emergency Preparedness
2:00 pm	**ES Presentation Number 2** – Gordon Chinander GISP, Metropolitan Emergency Services Board
2:20 pm	**Public Service Presentation Number 1** – David Brandt, Washington County GIS
2:40 pm	**Break:** Snacks and drinks
3:00 pm	**Public Service Presentation Number 2** – Randy Knippel, Dakota County GIS
3:20 pm	**Core Themes and Findings From Past GECCos** – Dave DiSera
3:40 pm	**Panel Discussion: Defining What's Possible "Now" By Working Together.** This discussion will explore the topic from primarily the tactical (near term) perspective. Audience reaction to discussion items will be captured for review during the Executive Summary Session. Moderator – Dave DiSera Panelists: • Paul Weinberger, MN Department of Transportation • Bob Basques, City of St. Paul Public Works • Dan Anderson, Hennepin County Emergency Preparedness • Gordon Chinander GISP, Metropolitan Emergency Services Board • David Brandt, Washington County GIS • Randy Knippel, Dakota County GIS
4:30 pm	**Wrap up/Conclude – Dave DiSera** (People and Policies themes are now complete)
Friday, October 28, 2011 (Practical Learning: Table Top, Executive Summary, Next Steps Discussion)	
8:00 am	**Registration, Light Continental Breakfast, Networking** (Decision Makers are welcome to join at any point up until Noon)
8:30 am	**A Brief Overview of Other Geospatial Resources for Emergency Preparedness and Response** – Mike Dolbow, MN Department of Agriculture HAZUS, Cameo, USGS, MnGeo/MetroGIS data catalogs, etc. – Reference document provided. (Technology theme is now complete)

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9:00 am	**Table Top Exercise** – Facilitators: Bob Samborski, Dave DiSera, Talbot Brooks, and Scott Bailey John Hoshal (MnGeo), Mike Dolbow, Randy Knippel and Jeff Grussing (Great River Energy) have been up to "No Good" while planning this event. Standby for trouble right here in River City. In fact, it might be a good idea to dust off any notes you've taken since the start of the GECCo.
10:45 am	**Break**
11:00 am	**Large Group Table Top Discussion** – Talbot Brooks Bringing into focus the technology, people, and policy impediments to sharing geospatial data.
Noon	**Networking/Working Lunch** • Last point for Decision Makers to join the event. • 12:30-1:15: **Rapid Advancements In Geospatial Technology and What Every Decision Maker Needs to Know,** Dr. Carl Reed, CTO of the Open Geospatial Consortium, Fort Collins, CO.
1:15 pm	**"Next Steps" Executive Summary Session – What Needs to be Done – Who Is Going to Do It?** Discussion Lead: Dave DiSera
2:15 pm	**Closing Remarks, and Adjourn:** Bob Samborski (Return travel time starts for out of town guests)
3:00 pm	**Opportunity for informal side discussions concludes**

Version 4.0 Agenda October 26, 2011

APPENDIX F: EXERCISE SCENARIO PACKET

Twin Cities Geospatially Enabling Community Collaboration (GECCo) Workshop

"Mayday, Mayday"

Table Top

Twin Cities Area GECCo Tornado Table Top Exercise ("Mayday, Mayday")

Tabletop Objectives

- Allow participants to act in response to the table top incidents,
- Foster dialogue between participants,
- Identify data and capabilities needed to respond to an event,
- Identify data sharing and collaboration barriers among public agencies, infrastructure owners, and other private organizations, and
- Provide input for future critical infrastructure protection and emergency operations planning.

Ground Rules

- Due to time constraints, this is not the typical Homeland Security Exercise and Evaluation Program (HSEEP) style Table Top that would examine current capabilities or response plans such as the National Response Plan (NRP) or Minnesota Emergency Operations Plan (MEOP). It's an exercise about existing local geospatial collaboration and data sharing issues during a hypothetical emergency, and the subsequent cascading events.
- The exercise will be an open dialogue. All ideas and input are welcome.
- The scenario will be accepted as is, with no hypothetical resources available.

GITA – Twin Cities GECCo 3 10/28/2011

Preparation Phase – "Mayday, Mayday": 5/1/201X

Background – Week Prior

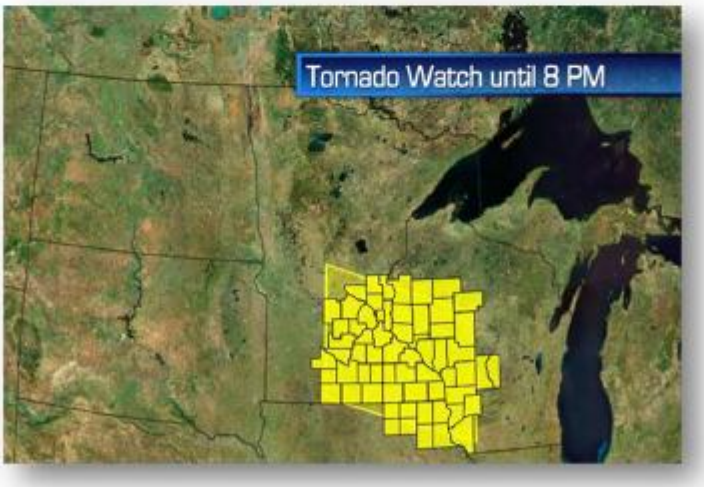
This scenario is based on a fictitious (but plausible) set of incidents occurring after a wet (flooding) spring and subsequent warm weather.

High snow fall amounts over the past winter have combined with a late thaw and rapidly rising temperatures to produce record breaking flooding in the Red River Valley. Minnesota National Guard and other state and local assets have been stretched thin by deployment to the area. In addition, FEMA and other Federal assets are already focused on significant damages from recent tornadoes in Oklahoma and Texas which have caused catastrophic damage and loss of life.

In the Twin Cities metropolitan area, significant downpours in the days leading up to May 1st have swelled rivers and streams to the verge of flooding. With more rain predicted in the days ahead, individuals living in low lying areas of the Metro are being evacuated to shelters. This effort has included the evacuation of several nursing homes.

Background – Morning of May 1st, 201X

A large weather front sweeps across the Midwest, creating dozens of individual severe weather outbreaks across Minnesota and elsewhere. Over 40 tornadoes are reported throughout the Midwest as well as numerous lightning, hail, heavy rain, and high wind events. The weather outbreak has created several incidents requiring the response, planning, and management of these incidents.



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Preparation Phase – "Mayday, Mayday": 5/1/201X

Major Questions

- How does your organization's GIS capabilities get "geared up" for an event?

- Who is involved in preparation?

- What challenges do you and your organization face?

- What key data sources do you rely on and attempt to compile in advance? In what formats?

Response Phase -"Mayday, Mayday": 5/1/201X

Time: 2:30 PM

- The National Weather Service (NWS) issues a tornado watch for Hennepin, Ramsey, Anoka, and Dakota counties.

Time: 3:47 PM

- NOAA radio notifies that Hennepin. Ramsey, Anoka, and Dakota counties are under a Tornado Warning.
- Trained weather spotters report a tornado on the ground in Crystal, moving at 45+ mph in an east-northeast direction towards north Minneapolis and northern Ramsey County.

Time: 4:07 PM

Incident #1 – Downed Power Lines.

An F4 tornado has downed several of Xcel Energy's 115-volt high-tension power lines along the I-94 corridor in Minneapolis. Several neighborhoods in the north metro, with approximately 20,000 people, are without power. Utility crews know where the damages are, but experience significant delays in transit when they encounter closed or impassable roads due to downed trees and flooding along several major arteries.

This tornado has also caused significant damage to the over-air broadcast towers along I-694 in Shoreview. Broadcast television and radio are anticipated to be offline for at least 24 hours.

Response Phase -"Mayday, Mayday": 5/1/201X

Major Questions

- What is your initial response to a multi-jurisdictional incident?

- What tools can your individual organization provide to support the response?

- What capabilities are you aware of that are supported by other organizations?

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Response Phase -"Mayday, Mayday": 5/1/201X

Time: 4:23 PM

- Trained weather spotters report a tornado on the ground just west of Richfield, moving at 30+ mph in an east-southeast direction towards the Mall of America (MOA) and the Minneapolis-St. Paul International Airport (MSP).

Time: 4:32 PM

Incident #2 – MSP and MOA Property Damage.

Another massive, F4-class tornado has traveled east-southeast over MSP and MOA, staying on the ground for the nearly 12 miles. MSP terminals 1 and 2 sustain major structural damage. Portions of the roof are gone on Terminals 1 and 2. Dozens of commercial aircraft and several hangers have been severely damaged. A jet fuel tank at the airport has ruptured. The containment wall has failed and fuel is leaking into the storm sewer. Reports of hundreds of people are injured in both the terminals and on the planes. Additional reports indicate the military side of the field has sustained significant damage and there is the high potential for significant loss of life.

Major damages and casualties are reported at MOA, requiring deployment of Bloomington Fire, EMS, and Rescue. Impassable roads have caused significant traffic delays, forcing thousands of mall visitors to remain inside the mall without access to power or water.

Substantial private and commercial property damage has occurred from Dakota County across the river from MSP. Wide spread power outages are being reported across the area. There is limited communications capability. Wired phone services are out and cell phones are working sporadically.

Response Phase -"Mayday, Mayday": 5/1/201X

Major Questions

- Where would you get your information about this event?

- Would you anticipate getting a call from an Incident Commander to be part of an Incident Management Team to respond to this event?

- What critical information and capabilities would you be prepared to provide?

Response Phase -"Mayday, Mayday": 5/1/201X

Time: 4:46 PM

- Trained weather spotters report a tornado on the ground just west of downtown St. Paul, traveling 25+ mph through residential areas of St. Paul towards downtown. Freeways are filled with rush–hour commuters.

Time: 4:58 PM

Incident #3 – MN State Agency Power Disruption.

A shorter-duration but powerful F-4 tornado has traveled through residential areas of St. Paul and into St. Paul's Capitol Complex, resulting in power outages for virtually all state agencies. Backup power systems fail. Supercells with heavy rains accompanied this massive storm event. Flash flood warnings are issued by the National Weather Service for Hennepin and Ramsey counties.

Response Phase -"Mayday, Mayday": 5/1/201X

Major Questions

- What core geospatial capabilities are available that you can rely on during major power outages?

- What are the essential data layers required by emergency responders at this point, and at what level of granularity/detail?

- Is there a common operating picture that you can consume and contribute to?

- Do you have ready access to contact information for your colleagues in other organizations?

Response/Recovery Phase -"Mayday, Mayday": 5/1/201X

Extended Response: Next 24-36 Hours

Emergency response
There were calls waiting by 4:15 pm. Reserve responders and off-duty personnel could not be recalled quickly due to downed power lines and trees, failure of traffic control devices, and flooding. Transport of major medical to trauma centers is limited due to transportation failures. Water supply for firefighting is compromised due to power loss from the lightning strikes. Police radio communications have failed (MDT and NCIC).

Despite the limitations above, Emergency Responders were doing their best to conduct the following efforts:

- Search and Rescue
- Triage/Treatment of Injuries
- Managing/Tracking Fatalities
- Evacuation of unstable areas
- Debris management

Unified Command has been established via the Incident Command System (ICS) and Mutual Aid agreements are in effect.

Affected Infrastructure and Services

Power generation, transmission, and distribution
With downed transmission and distribution lines across the area, and power fluctuations on the grid, power plants were put into "safe mode" to prevent damage in the case of an overload. This put much of the power generation normally available offline until those plants could be slowly taken out of "safe mode". Power consumption is to be limited to essential services only for the next several days.

Water production, distribution, and supply
Some areas lost water pressure because pumps lost power. This loss of pressure caused potential contamination of the water supply. Nearly 250 hundred thousand customers in the greater Twin Cities area were under a boil water advisory, four days after the initial outage. Hennepin County ordered over 500 restaurants closed until they were decontaminated after the advisory was lifted. Pumping stations lost power and caused sewage back-ups in low lying communities around the lakes and river.

Transportation services
Air passenger and freight had to be diverted to the St. Paul Airport due to the excessive damage to the MSP International Airport. Most gas stations were unable to pump fuel due to lack of power. Throughout the area, traffic problems were compounded by downed trees, debris, and loss of traffic signals and by motorists who simply drove until their cars ran out of gas on the highway. The major arteries leaving the urban area are choked with traffic, accidents, and

Response/Recovery Phase -"Mayday, Mayday": 5/1/201X

debris. Due to the excessive amounts of rain, some communities are isolated due to ponding of water and flooding along access routes.

Communication services

Cellular communication devices, along with microwave communications were disrupted. This was mainly due to the loss of backup power at the cellular sites where generators ran out of fuel or cell phone batteries ran out of charge. Wired telephone lines were lost and hundreds of thousands of home users had only cordless telephones depending on house current. Most Twin Cities TV stations were knocked off over-the-air broadcasts for a period of time due to the damage in Shoreview.

Cable television systems were lost or disabled, and areas that had power restored (and had power to their television sets) could not receive information until power was restored to the cable provider. Those who relied on the Internet or Satellite television were similarly disconnected from their news source for the duration of the power outage.

Major Questions

- What capabilities can you provide to support the efforts of the Emergency Response and Infrastructure Communities?

- What tools can you rely on under major power outages?

- Where are you going to get your information about the event?

- How will you provide your information to responders?

Response/Recovery Phase -"Mayday, Mayday": 5/1/201X

Recovery: Following 2-3 Months

Power is restored for the majority of residents and businesses within 96 hours of the event, but massive cleanup efforts continue for 6 weeks, requiring response personnel and support staff to put in double 8-hour shifts per day, 7 days a week. Several major arteries and local feeder roads remain closed for 4 weeks, pending debris management and cleanup efforts. Water advisories and ancillary pollution concerns persist for 8 weeks.

Major Questions

- Would you be able to sustain double shifts, 7 days a week, with your current personnel?

- What capabilities could you provide that would assist long-term cleanup efforts?

- How can you collaborate with your colleagues in other organizations to provide support?

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APPENDIX G: EVENT PHOTOS

To help enhance understanding of the event, find below a few representative photos.

Photo G.1 – *Recovery Phase Discussions:* Working against the clock, members of the "Fox Tribe" (group in foreground) discuss how they would use geospatial technologies during the Recovery Phase of the Twin Cities GECCo Table Top Exercise.

Photo G.2 – *Electrical Grid Discussion:* Scott Bundy, Sr. Solutions Consultant for all GIS at Excel Energy (left center, red shirt), offers his insights about the Twin Cities electrical grid during Table Top discussions of the "Leopard Tribe".

Photo G.3 – *Event Findings:* During the Twin Cities GECCo's final event, GITA's Tablot Brooks (left) and Dave DiSera (right), presented overall findings to the 69 two-day TCGECCo participants/staff and 15 regional and State Decision Makers who had joined the group for a lunch time key note by Dr. Carl Reed and the Next Steps discussion.

APPENDIX H: ACRONYMS

Table H.1: *Acronyms (Hyperlinks provided where reasonable)*

Acronym	Meaning
AAR/IP	After Action Report/Improvement Plan
ACAMS	Automated Critical Asset Management System
AICP	American Institute of Certified Planners
ARC	American Red Cross
CAD	Computer Aided Dispatch
CAP	Civil Air Patrol
CEMP	Comprehensive Emergency Management Plan
CI/KR	Critical Infrastructure/Key Resources
CIO	Chief Information Officer
CONOPS	Concept of Operations
COOP	Continuity Of Operations Plan
COP	Common Operating Picture
CURA	Center for Urban and Regional Affairs - University of Minnesota
DHS	Department of Homeland Security, U.S.
DNR	Department of Natural Resources, Minnesota
EARP	Electronic Audience Reaction Polling
EEG	Exercise Evaluation Guide
EOC	Emergency Operations Center
EMS	Emergency Medical Services
EPC	Emergency Preparedness Committee, Minnesota Geospatial Information Office
ESS	Emergency Services Sector
FEB	Federal Executive Board, Minnesota
FGDC	Federal Geographic Data Committee
GECCo	Geospatially Enabling Community Collaboration
GeoCONOPS	Geospatial Concept of Operations
GII	Geospatial Information Infrastructure
GIO	Geospatial Information Officer
GIS	Geographic Information Systems
GISP	Geographic Information Systems Professional
GIT	Geospatial Information Technology
GITA	Geospatial Information and Technology Association
HIFLD	Homeland Infrastructure Foundation-Level Data Working Group
HSEEP	Homeland Security Exercise and Evaluation Program
HSEM	Homeland Security and Emergency Management – Division, Minnesota Department of Public Safety
HSIN	Homeland Security Information Network
HSIP	Homeland Security Infrastructure Protection
HTTR	HIFLD To The Regions

Acronym	Meaning
IA	Implementing Authority
ICS	Incident Command System
IICD	Infrastructure Information Collection Division
IP	Improvement Plan
LOGIS	Local Government Information Systems Association
MAC	Metropolitan Airports Commission
MACC	Multi Agency Communications Center
MEOP	Minnesota Emergency Operations Plan
MESB	Metropolitan Emergency Services Board
MMCD	Metropolitan Mosquito Control District
MnDOT	Minnesota Department of Transportation
MnGeo	Minnesota Geospatial Information Office
MNNG	Minnesota National Guard
MOU	Memorandum of Understanding
MSC	Minnesota Structures Collaborative
NGAC	National Geospatial Advisory Council
NGB	National Guard Bureau
NGO	Non-Governmental Organization
NIMS	National Incident Management System
NIPP	National Infrastructure Protection Plan
NRF	National Response Framework
NSARC	National Search and Rescue Committee
NSDI	National Spatial Data Infrastructure
NSGIC	National States Geographic Information Council
NWCG	National Wildfire Coordinating Group
NWS	National Weather Service
OET	Office of Enterprise Technology
OGC	Open Geospatial Consortium
PPD-8	Presidential Policy Directive/PPD-8
SEOC	State Emergency Operations Center
SOG	Standard Operating Guidance
SOP	Standard Operating Procedure
TCL	Target Capabilities List
TCGECCo	Twin Cities Geospatially Enabling Community Collaboration
TTX	Table Top Exercise
UASI	Urban Area Security Initiative
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USNG	United States National Grid

APPENDIX I: REFERENCES

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