REPORT TO THE WISCONSIN HOMELAND SECURITY COUNCIL

THE STATE OF GEOSPATIAL INFORMATION SHARING IN WISCONSIN

GEOSPATIAL INFORMATION SHARING SUBGROUP

OF THE

INFORMATION SHARING WORKING GROUP

FINAL REPORT

JANUARY 9, 2014

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1. EXECUTIVE SUMMARY

In February 2013, the Wisconsin Homeland Security Council commissioned the study of geospatial information sharing associated with public safety events and emergency responses in the state. The Council asked its existing Information Sharing Working Group to assemble a subgroup of GIS professionals to research geospatial information sharing issues and challenges faced by entities involved in public safety and emergency response activities. The subgroup was also asked to provide recommendations to help resolve geospatial information sharing issues and eliminate obstacles. This report is provided to the Council on behalf of the Information Sharing Working Group.

The Geospatial Information Sharing Subgroup began its work in March 2013 and concluded in January 2014. The Subgroup identified **eight** major issues and challenges that hinder geospatial information sharing <u>before</u>, <u>during</u> and <u>after</u> public safety events and emergency responses. Most of these are not technical in nature, and are associated with the programmatic, policy, governance, and operational activities of individual entities. The successful implementation of technical recommendations will be dependent on the resolution of non-technical issues and challenges.

No single entity or group of entities is responsible for Wisconsin's geospatial information sharing problems, and no single entity has the authority and resources necessary to solve them. Previous attempts to address geospatial information sharing issues have been largely unsuccessful due to lack of executive level awareness and support at all levels. A coordinated, structured and systematic approach is required to improve geospatial information sharing among all government, private and non-profit entities across Wisconsin.

Once the eight major geospatial information sharing issues and challenges affecting public safety and emergency response activities in Wisconsin were identified, the Subgroup developed **four** major recommendations to address these issues and begin to eliminate obstacles. Each recommendation includes suggested action steps and lead entities.

#1 Require government-to-government geospatial information sharing and eliminate requirements for sharing agreements, fees, copyright permissions, disclaimers, and similar obstacles associated with government geospatial information during public safety events and emergency responses.

#2 Streamline government-to-government geospatial information sharing for activities associated with FEMA National Prevention, Protection, Mitigation, and Disaster Recovery Framework activities (i.e., activities prior to and after public safety events and emergency responses).

#3 Integrate geospatial data, technologies and practices into Wisconsin's National Incident Management System (NIMS) activities (including ICS and NRF) to (1) clarify lines of communication between entities requesting and providing geospatial information, (2) define geospatial roles and responsibilities and (3) establish procedures for sharing of geospatial information during public safety events and emergency responses.

#4 Establish a centralized geospatial data exchange that will allow organizations to share and access "critical" geospatial information faster and more efficiently before, during and after public safety events and emergency responses.

2. BACKGROUND

Wisconsin public safety and emergency management entities at all levels of government have a wide range of planning, response and evaluation responsibilities that require fast and efficient access to data from other government, private and not-for-profit entities. This includes access to electronically-created and maintained **geospatial** information, such as parcels, roads, floodplains, political boundaries, facilities, elevation, and digital aerial imagery.

> **"Geospatial" generally refers to the location or position of people, places and things on earth. Geospatial technologies, such as GIS, incorporate geographic information to help users understand spatial relationships and make better-informed decisions.**

Understanding the spatial relationships among the people, entities, infrastructures, and environmental conditions associated with public safety and emergency management activities provides many benefits.

Unfortunately, Wisconsin's current geospatial information sharing environment often leaves federal, state, local, tribal, private, and non-profit entities that support public safety and emergency response activities without critical data needed to facilitate and improve decision-making and response effectiveness. The ability of one entity to access or acquire needed geospatial data from others can be extremely difficult, labor intensive and costly. In Wisconsin, this has proven true during actual public safety events and declared emergencies. A case study of the 2008 flooding across Wisconsin (see Appendix A) illustrates some of the information sharing challenges faced by first responders, emergency managers, law enforcement, and others, and exemplifies how the state would benefit from a more coordinated approach to geospatial information sharing.

It is important to note that Wisconsin's geospatial information sharing challenges are not new, and are not isolated to one type of entity or one governmental level. The *status quo* has existed for over two decades, with only minor improvements occurring when a particular entity decides to eliminate an obstacle it internally controls (e.g., remove its data sharing agreement requirement, make its data openly available via the web). While geospatial information sharing does occur, it is neither consistent nor adequate to meet the needs of public safety and emergency management in Wisconsin.

For example, a 2013 Department of Administration (DOA) survey asked counties if they would be willing to contribute geospatial data to a "...statewide central repository for GIS data access." Over half (38) indicated they would be willing to provide some public access, with another 17 counties limiting access to state agencies only. The remaining 17 counties would place additional limits on access to their geospatial information, with three of those unwilling to share at all.
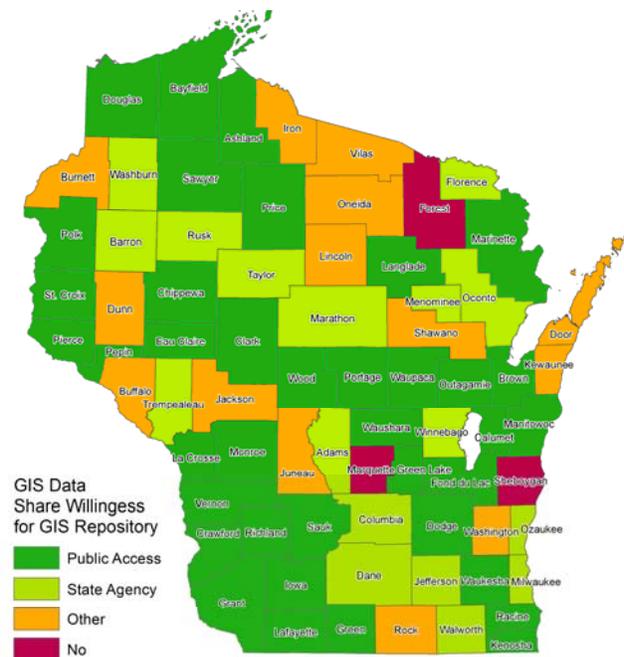
Unlike many counties, state agencies generally provide most non-sensitive geospatial information upon request, without sharing agreements and fees. They also have procedures in place to provide access to information protected by federal or state law. However, state agencies do face geospatial information sharing challenges during public safety events and emergency responses. Specifically, some administrative rules and internal policies restrict access to "critical" geospatial information solely for cost recovery purposes (e.g., Wisconsin Wetlands Inventory), because of perceived liability (e.g., floodplain maps), or because of perceived security threats (e.g., location of public water supplies and power grid infrastructure). State agencies currently lack standard procedures to overcome these types of restrictions during public safety events and emergency responses.

Previous attempts to identify and resolve geospatial information sharing challenges have been largely unsuccessful, primarily due to (1) lack of executive level awareness and support at all levels of government, and (2) lack of coordinated, systematic, structured approaches to try to resolve these issues. Several patterns and rationales that limit geospatial information sharing are recurring and have remained essentially unchanged in the 1980s. See Appendix B for a general geospatial information sharing timeline.

Researching information sharing for emergency related planning, response and evaluation activities fits well within the mission of the Wisconsin Homeland Security Council. The Council's established Information Sharing Working Group is charged with studying non-geospatial information sharing issues. A small subgroup of geospatial professionals was assembled under this working group and assigned the following tasks:

- Identify and document challenges that public safety and emergency management entities encounter when <u>attempting to access</u> geospatial information from other entities.

- Identify and document key issues <u>hindering or preventing entities from sharing</u> their geospatial information with other entities.

- Provide a set of <u>recommendations to improve geospatial information sharing</u> in Wisconsin public safety and emergency management planning, response and evaluation activities.

The subgroup began its work in April 2013 and met regularly throughout the process. The subgroup delivered this final report the Wisconsin Homeland Security Information Sharing Working Group in January 2014.

Before discussing specific geospatial information sharing challenges and issues, the subgroup first identified several assumptions it used to define the scope of this report.

Assumption 1: Geospatial information sharing challenges and issues may occur at several key action points. Specifically, public safety and emergency management entities may encounter geospatial information sharing challenges and issues when they try to:

- search for needed data,
- request a copy of data or access to data (e.g., via web service) from another entity, or
- use geospatial data from another entity or aggregate data from multiple entities.

Assumption 2: Geospatial information sharing challenges, issues and recommendations may be non-technical or technical in nature. This document focuses on non-technical concepts because the vast majority of information sharing challenges and issues that Wisconsin public safety and emergency management entities face are non-technical. Specifically, they involve legislative, legal, policy, procedural, governance, funding, staffing, training, communication, and similar issues. The subgroup believes that non-technical obstacles <u>must</u> be removed before technical solutions can be successfully implemented. Technical geospatial information sharing challenges issues are most often associated with a lack of consistent data and technology standards and processes, and/or inconsistent adoption and implementation of those standards and processes. Technical concepts are also described in this document, where applicable.

Assumption 3: Geospatial information sharing challenges, issues and recommendations may differ for government, non-profit and private entities. Presidential Policy Directive 8 (PPD8) clearly focuses on a "Whole Community" approach to national preparedness, and provides direction for government, private organizations, non-profits, and citizens to come together to "...keep the nation safe from harm and resilient when struck by hazards, such as natural disasters, acts of terrorism and pandemics."[1]   While this document focuses on government-to-government information sharing, where applicable, the challenges, issues and recommendations specific to non-profit (e.g., Red Cross, Salvation Army) and private entities (e.g., utility companies, private hospitals) are also addressed.

Assumption 4: Geospatial information sharing challenges, issues and recommendations may differ for local, regional, state, tribal, and federal government entities. This document focuses on geospatial information challenges and issues faced by local and state government entities, primarily because Homeland Security Council members represent these government entities. Since the State of Wisconsin does not have control over federal or tribal laws, policies, protocols, etc., it seems more efficient to "get the State's house in order" first. However, where applicable the challenges, issues and recommendations specific to entities of other levels government are also addressed.

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[1] http://www.dhs.gov/presidential-policy-directive-8-national-preparedness

The subgroup also acknowledged that the State of Wisconsin has various "home rule" provisions that allow local government entities to maintain control over emergencies, while state and federal agencies provide support to local government. However, in situations where emergencies cross jurisdictional boundaries, or where one entity asks for assistance from another, sharing of geospatial data is vital to aid in situational understanding and decision making.

Assumption 5: Geospatial information sharing challenges, issues and recommendations may differ for each National Planning Framework[2]. This document focuses on the *National Response Framework* that involves decision-making and actions <u>during</u> a public safety event or emergency response. Where applicable, the challenges, issues and recommendations associated with the other National Planning Frameworks – *Prevention, Protection, Mitigation,* and *Disaster Recovery* – that occur <u>before</u> or <u>after</u> response activities are also described.

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[2] http://www.fema.gov/national-planning-frameworks

4. GEOSPATIAL INFORMATION SHARING CHALLENGES

Given the assumptions above, the subgroup identified the following major challenges and issues limiting or preventing Wisconsin geospatial information sharing for public safety and emergency management purposes.

1. **Lack of Wisconsin statute or administrative rule language that requires and facilitates geospatial data sharing <u>during</u> public safety events and emergency responses.** The subgroup was surprised to learn that no special government "information sharing" powers or requirements appear to exist in Wisconsin during disasters. Our research found no current state statute or administrative rule that directly addresses geospatial information sharing among government entities for public safety or emergency management purposes. In addition, ch. 323, Wis. Stats. (Emergency Management) does not include any specific requirements or provisions for data sharing among entities. Appendix C lists Wisconsin statutes, rules and other legal documents that include geospatial information sharing concepts.

> **It is generally <u>assumed</u> that information sharing is somehow legally required and automatically occurs during public safety events and emergency responses, but this is not the case.**

2. **Lack of Federal Emergency Management Agency (FEMA) guidance on the use of geospatial information and technologies within the National Response Framework (NRF).** The NRF "provides context for how the whole community works together and how response efforts relate to other parts of national preparedness."[3] However, geospatial data and GIS are only mentioned in Emergency Support Function (ESF) *#5 Information and Planning Annex*.[4] In reality, geospatial data and technologies are, to varying degrees, used for response activities associated with all fifteen ESFs (e.g., *#1 Transportation Annex*, *#11 Agriculture and Natural Resources Annex*, and *#13 Public Safety and Security Annex*) described in the NRF.

   This lack of federal guidance within the framework Wisconsin relies upon during disasters may lead some people to view geospatial information and technologies, such as GIS, as "nice to have" but not essential to decision making. It may also be one reason why very few GIS staff in Wisconsin local, county and state government entities have any Incident Command System (ICS) training, participate in drills and exercises, or are included in Emergency Operations Center (EOC) activities. Both the data requester and data steward may be confused about the basic fundamentals of ICS communication and support activities-*Who can ask for information and who can approve the release of information when ICS protocols are in place?*-resulting in costly delays and unnecessary workload.

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[3] http://www.fema.gov/national-response-framework
[4] http://www.fema.gov/media-library-data/20130726-1913-25045-2444/final_esf_5_information_and_planning_20130501.pdf

3. **Lack of consistent and adequate Wisconsin protocols for requesting and sharing geospatial information <u>during</u> public safety events or emergency responses.** From a practical point of view, it makes sense that each entity creates and maintains geospatial information based on its internal business mission, needs, priorities, and resources. These efforts rarely consider needs beyond the entity, so each entity's geospatial information typically stops at its jurisdictional boundary. Natural and man-made disasters have no boundaries, and regional and state government entities must operate across local jurisdictional boundaries.

> **Most stewards do their best to share geospatial information quickly and without obstacles during public safety events and emergency responses.**

An entity that creates and maintains a geospatial dataset is considered the "data steward" of that information, and grants access to it according to that entity's information sharing policies. Each steward handles geospatial information sharing requests differently, and, in Wisconsin, stewardship rights over "critical" geospatial information are widely dispersed among government entities at all levels. Therefore, most geospatial information sharing that does occur during disasters is informal, relying on professional "goodwill" among geospatial colleagues within the participating entities. As more jurisdictions are impacted by a disaster, and more government, non-profit and private entities become involved in response efforts, the logistics and workload involved in accessing geospatial information can be burdensome and time consuming.

When goodwill fails, Wisconsin's Open Records law (ch. 19.31-19.39, Wis. Stats.) is one mechanism entities try to use to access geospatial information from other government entities. While sometimes successful, the Open Records request process is inefficient <u>during</u> public safety events and emergency responses because it: (1) allows time for review, interpretation and denial by data stewards and (2) can be hampered by information sharing agreements, fees and other obstacles.

Some Wisconsin state agencies require data sharing agreements or fees for specific geospatial information under statute, administrative rule, or internal policy. Wisconsin counties, cities, villages, and towns also have Constitutional or administrative "home rule" authority to pass ordinances or enact policies to regulate local affairs.[5] In some cases, the concept of "home rule" has also resulted in the adoption of local policies requiring geospatial information sharing agreements or fees.

Geospatial information sharing agreements required by state and local government entities present several challenges, especially for other government requesters during public safety events and emergency responses.

- Is it unclear whether it is applicable and legally valid for a Wisconsin government steward to require a signed agreement to share its geospatial information-*created and maintained using public funding*-with another Wisconsin government entity.

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[5] http://legis.wisconsin.gov/lc/publications/im/IM2013_01.pdf

- The concept of geospatial information agreements appears to contradict the intent and protocols of Wisconsin's Open Records law. This is especially true when a government steward requires a signed agreement to fulfill what practically amounts to another's Open Records request.

- The content and implementation of geospatial information sharing policies and agreements are highly inconsistent across Wisconsin government entities. Each agreement requires legal and program review, after which people with appropriate signature authority–*for both the requester and the steward*-must be found to sign it. All of these steps take time and effort, and can unnecessarily delay decisions and actions during public safety event or emergency response.

- Even if a geospatial information sharing agreement is signed, the steward may not always provide the data in a timely manner. Some still send data on DVD via mail service due to perceived security concerns about FTP and other internet-based data exchange mechanisms. In some cases, the steward's acceptable delivery timeline–*days or weeks*-is included in the agreement that must be signed before data can be accessed.

- Some government stewards require a fee–*nominal to thousands of dollars*-to access or share their geospatial information. Dealing with government purchasing protocols during a public safety event or emergency response takes time and effort, delaying crucial decisions and actions. In addition, many wonder whether it is applicable and legally valid for Wisconsin government entities to charge each other for geospatial data created and maintained using public funding.

- In many cases, information sharing agreements contain significant restrictions on geospatial data created and maintained using public funding. These are intended to: (1) limit the use of the data, (2) require specifically worded disclaimers or acknowledgements on maps, and/or (3) indicate the steward has "copyrighted" the data and, therefore, must grant additional permission for its display, reproduction, distribution, and/or use in derived works. Wasting time dealing with these issues serves no real purpose except to delay efficient and effective decision-making and action during public safety events and emergency responses.

4. **Lack of consistent protocols and policies for sharing "sensitive" geospatial information during public safety events or emergency responses.** Within this report, "sensitive" geospatial information is identified as confidential or otherwise protected from access and/or distribution under federal law, or Wisconsin statute or administrative rule. All Wisconsin government entities collect and maintain some "sensitive" geospatial information, much of it related to personally identifiable information (ch. 19.62 Wis. Stats). However, some sensitive geospatial information may be critical during specific types of emergencies, such as Department of Agriculture Trade and Consumer Protection (DATCP) registered livestock premises locations, or Wisconsin Emergency Management (WEM) Emergency Planning and Community Right-to-Know Act (EPCRA). These datasets are protected from public access but may have value during an event.

In some cases, government entities have adopted internal policies that identify geospatial information as "sensitive" for other reasons. For example, DNR limits access to the locations of public water supplies for reasons related to homeland security, and limits access to floodplain data for liability reasons. Some counties limit access to parcel attribute data that may contain personally identifiable information.

This issue is equally important for public utilities, non-profit and private entities that are stewards of "critical" geospatial information, especially given their role in the PPD8 "Whole Community" approach (see Assumptions above). Specifically, some of their data may be considered "sensitive" for reasons associated with homeland security (e.g., locations of power grid components), to protect competitive trade secrets (e.g., milk truck routes), or a variety of other reasons.

Accessing "sensitive" geospatial information from a government, public utility, or private entity usually requires the requester to sign a confidentiality agreement or data sharing agreement. As mentioned above, spending time reviewing and signing legal documents <u>during</u> public safety events or emergency responses in highly inefficient and can delay decision-making and actions.

5. **Lack of an official list of "critical" geospatial information commonly considered necessary for public safety events and emergency responses.** It is impossible to prioritize the state's geospatial information creation, acquisition and maintenance activities, as well as related resource and funding allocations, without an officially adopted list of critical data necessary to support decision-making and actions during public safety events and emergency responses.

   Such a list would help prioritize data sharing needs and provide direction for stewards willing to share their geospatial information openly and freely. Since private entities are stewards of some "critical" geospatial information, such a list would also help identify where government/private partnerships must be developed to help facilitate geospatial information sharing as guided by PPD8. The State of Missouri State Emergency Management Agency has developed such a list (see Appendix E) which could be a good starting point for a Wisconsin specific list.

   In addition to identifying "critical" geospatial information that currently exists, the process of developing and maintaining such a list would help identify gaps in available data. For example, it could identify which "critical" geospatial information is:

   - Complete statewide, current, and available for sharing
   - Incomplete statewide, but pieces current and available for sharing
   - Non-existent in an electronic geospatial format
   - Non-existent in any format

6. **Lack of a comprehensive, statewide inventory of <u>all</u> government geospatial information.** What Wisconsin entity, if any, can provide information about the locations of schools, livestock, floodplains, contaminant plumes, areas with power outages, etc.? Unlike many other states, Wisconsin lacks a centralized, easily accessible, and maintained inventory of "critical" <u>and</u> all other current geospatial information holdings of government entities. As mentioned above, this fosters the *status quo* in which each entity's success acquiring critical geospatial information during a public safety event or emergency response depends primarily on the knowledge, involvement and relationships of geospatial professionals within entities.

   Of course, it is impossible for even the most experienced geospatial staff to know everything about all geospatial information in Wisconsin. Contacting many different potential stewards <u>during</u> a public safety event or emergency response is extremely inefficient and time consuming for government, non-profit and private entities. A statewide inventory that provides basic facts about all existing government geospatial data would support the initial searches for data to support public safety event and emergency response activities.

- What geospatial information exists?
- Which government entity is the steward?
- Who is the steward's contact person, and what is his/her contact information?
- Is the geospatial information useful for a particular situation (e.g., current, complete)?
- How can the geospatial information be accessed or acquired?

At the very least, an inventory identifying and describing "critical" geospatial information commonly considered necessary for most public safety events and emergency responses would benefit all stakeholders (see Challenge 5 above). However, since each event or response has unique aspects, it is difficult to predict what geospatial information will be useful in a given situation. Therefore, a more comprehensive inventory would help people search for geospatial information not previously identified as "critical" for public safety events and emergency responses.

7. **Lack of a centralized exchange mechanism for accessing "critical" geospatial information.** Wisconsin also lacks a centralized exchange mechanism where copies of the "best available" geospatial information from multiple stewards are easily searched (i.e., via a centralized inventory – see above) and accessible for download. Such an exchange would support common locational awareness of all entities involved in the public safety event or emergency response, allowing them to integrate their respective subject matter information with shared "critical" geospatial information. When all participants are using the same "base map" information, decision-making and actions are more focused, efficient and effective. Other states (e.g., Utah, Arkansas, Oregon) have demonstrated the value of a centralized, "public access" geospatial information exchange mechanism, which also includes inventory services, web map services, data download services, etc.

A centralized exchange mechanism would also facilitate a more efficient process for receiving updates to critical geospatial datasets on a regular basis. Currently, many stewards consider requests for information updates as new and separate requests, and some even require that a new data sharing agreement be signed and/or additional fees be paid *for each update*. In fact, many sharing agreements specifically state that the steward is under no obligation to notify the requester of updates or to provide updates. As a result, most "critical" geospatial information requested during a public safety event or emergency response quickly becomes outdated, and must be requested again for the next event or response.

8. **Lack of government resources to identify and acquire geospatial information proactively prior to a public safety event or emergency response.** As mentioned above, in addition to immediate *National Response Framework* activities, geospatial information and technologies are used for *Prevention, Protection, Mitigation,* and *Disaster Recovery Framework* activities that occur before and after a response. However, no single Wisconsin government entity has the resources or authority necessary to identify and resolve-*proactively*-all existing geospatial information sharing issues on behalf of all potential stakeholders. In the current environment, this would require negotiating information sharing agreements between thousands of combinations of government, non-profit and private entities. Similarly, individual entities lack the resources to identify and resolve – *proactively* – the geospatial information sharing issues they would have with all their potential public safety or emergency response partners. A more coordinated, structured and systematic approach is urgently required.

5. RECOMMENDATIONS

Based on research and understanding of the challenges and issues hindering geospatial information sharing during public safety events and emergency responses, the Geospatial Information Sharing Subgroup proposes the following recommendations.

RECOMMENDATION #1

Require government-to-government geospatial information sharing <u>and</u> eliminate requirements for sharing agreements, fees, copyright permissions, disclaimers, and similar obstacles associated with government geospatial information <u>during</u> public safety events and emergency responses.

Action Needed:

✓ Review and, as applicable, modify statute (ch. 323, Wis. Stats.; ch. 16.967, Wis. Stats.; ch. 59.72, Wis. Stats) and related administrative rules (e.g., DOA 47), and grant contract language associated with the Wisconsin Land Information Program (WLIP) to require and facilitate the sharing of government geospatial data during declared states of emergency and other public safety and special events. **Recommended lead agency: DOA**

✓ Identify, review and, if applicable, modify other Wisconsin statutes, administrative rules, contract language, etc. to require and facilitate the sharing of government geospatial data during declared states of emergency and other public safety and special events. **Recommended lead agency: DOA**

✓ Develop framework guidance that promotes the sharing of non-sensitive "critical" government geospatial information during declared states of emergency and other public safety and special events. **Recommended lead agency: DOA, DMA**

✓ Develop framework guidance and a policy template for all government entities that establishes geospatial information sharing protocols for "sensitive" geospatial information protected by statue, rule or internal policy, while ensuring the protection of this information during declared states of emergency and other public safety and special events. **Recommended lead agency: DOA, DMA**

Challenge Alignment:

❖ *Lack of Wisconsin statute or administrative rule language that requires and facilitates geospatial data sharing <u>during</u> public safety events or emergency responses.*

❖ *Lack of consistent and adequate Wisconsin protocols for requesting and sharing geospatial information <u>during</u> public safety events or emergency responses.*

❖ *Lack of consistent protocols and policies for sharing "sensitive" geospatial information <u>during</u> public safety events or emergency responses.*

RECOMMENDATION #2
Streamline government-to-government geospatial information sharing for activities associated with FEMA National Prevention, Protection, Mitigation, and Disaster Recovery Framework activities (i.e., activities <u>prior to</u> and <u>after</u> public safety events and emergency responses).

Action Needed:
- ✓ Clarify the applicability and legal validity of government-to-government geospatial information sharing agreements and the various requirements and limitations contained within them (e.g., copyright, liability, fees, indemnification, disclaimers).
  Recommended lead agency: DOA, DOJ

- ✓ Clarify how Wisconsin Open Records laws apply to government-to-government sharing of geospatial information generated by technology such as GIS (i.e., issues identified by Wisconsin Supreme Court in WIREData Inc. vs. Village of Sussex).
  Recommended lead agency: DOA, DOJ

- ✓ Establish consistent geospatial information sharing policies, agreements, and/or processes among government entities at all levels by: (1) reviewing current geospatial information sharing agreements, policies and processes, and, <u>if necessary</u>, (2) providing guidance on government-to-government agreement language, and (3) developing a standard agreement template that all government entities can adopt. **Recommended lead agency: DOA**

- ✓ Streamline the process and reduce the burden of every state and regional government entity by designating one state level entity to sign county and local geospatial information sharing agreements on behalf of the State of Wisconsin.
  Recommended lead agency: DOA

Challenge Alignment:
- ❖ *Lack of government resources to identify and acquire geospatial information proactively <u>prior to</u> a public safety event or emergency response*

RECOMMENDATION #3
Integrate geospatial data, technologies and practices into Wisconsin's National Incident Management System (NIMS) activities (including ICS and NRF) to (1) clarify lines of communication between entities requesting and providing geospatial information, (2) define geospatial roles and responsibilities, and (3) establish procedures for sharing of geospatial information during public safety events and emergency responses.

Action Needed
- ✓ Review and, if necessary, update the Wisconsin Emergency Response Plan (WERP) to provide clear direction on the integration of geospatial data, technologies and processes into EOC operations, including staffing and other resources.
  Recommended lead agency: WEM

- ✓ Develop county and municipal GIS guidance to review WERP and adopt any newly integrated geospatial guidance in their internal Emergency Operations Plan, Emergency Response Plan, or other relevant plans. **Recommended lead agency: WEM**

- ✓ Promote and provide training access to the NIMS core curriculum courses for all geospatial professionals in Wisconsin. **Recommended lead agency: WEM**

✓ Encourage and ensure geospatial representation at state and local emergency exercises by updating and publishing exercise guidance documents for all government entities to adopt. **Recommended lead agency: WEM**

Challenge Alignment:
❖ *Lack of Federal Emergency Management Agency (FEMA) guidance on the use of geospatial information and technologies within the National Response Framework (NRF).*

❖ *Lack of consistent and adequate Wisconsin protocols for requesting and sharing geospatial information <u>during</u> public safety events or emergency responses.*

<u>**RECOMMENDATION #4**</u>
Establish a centralized geospatial data exchange that will allow organizations to share and access "critical" geospatial information faster and more efficiently <u>before</u>, <u>during</u> and <u>after</u> public safety events and emergency responses.

Action Needed:
✓ Coordinate identification and development of an official list of "critical" geospatial information needed to support Wisconsin public safety and emergency management activities. **Recommended lead agency: WEM**

✓ Homeland Security Council coordinate with DOA, the Wisconsin Geographic Information Coordination Committee (WIGICC) and the State Agency Geospatial Information Committee (SAGIC) to create and maintain a centrally accessible inventory of all government geospatial information holdings in Wisconsin. **Recommended lead agency: Homeland Security Council**

✓ Homeland Security Council coordinate with DOA, WIGICC and SAGIC to develop a plan to create and maintain a centralized exchange mechanism that supports access to inventoried "critical" geospatial information, and align plans for this exchange with resources associated with the "statewide digital parcel map" project established by Act 20. **Recommended lead agency: Homeland Security Council**

✓ Establish relationships with federal, state, county, local, tribal, private, and non-profit stewards of "critical" geospatial information and encourage participation in the inventory and data exchange once developed. **Recommended lead agency: DOA**

Challenge Alignment
❖ *Lack of an official list of "critical" geospatial information commonly considered necessary for public safety events and emergency responses.*

❖ *Lack of a comprehensive, statewide inventory of <u>all</u> government geospatial information.*

❖ *Lack of a centralized exchange mechanism for accessing "critical" geospatial information.*

❖ *Lack of government resources to identify and acquire geospatial information proactively <u>prior</u> <u>to</u> a public safety event or emergency response.*

In June 2008, the southern half of Wisconsin was affected by one of the worst rain events in the state's history. Periodic heavy rains fell on the state for nearly two weeks, amounting to 14 inches in some locations. Several major river systems swelled and overflowed, leaving many communities flooded, roads washed away, bridges destroyed, homes demolished, and crops damaged. Lake Delton received so much water that it carved a new path to the Wisconsin River and eventually drained completely, taking several homes with it and leaving debris scattered for miles downstream.

Geospatial data and technology (e.g., GIS) were used in the State EOC (SEOC) and in some county EOCs to help with response and recovery efforts. This was the second time in less than a year that GIS was used in the SEOC, and it was quickly recognized as one of the most valuable tools available to emergency managers. GIS professionals from several agencies assisted in the SEOC 24/7, and created maps and analyses that provided excellent situational awareness and greatly improved the decision making process. However, some geospatial information sharing challenges were also encountered along the way...

The biggest hurdle encountered by GIS professionals in the SEOC and county EOCs was access to necessary geospatial information from other entities. While many geospatial data sets were available, some were not. Most state agencies and counties responded quickly to requests for geospatial information, but other requests took significant time. Some geospatial data could not be integrated from local sources into SEOC formats easily. One particular example involved road closures.

The Department of Transportation (DOT) put out daily public awareness bulletins for state and federal road closures-county and local roads were not included. SEOC GIS staff received a request to create and maintain an "all roads" closure map. This proved to be an impossible task because (1) Wisconsin does not have an adequate statewide road network data set and (2) the many local governments responsible for county and local roads are not required to report road closures to the SEOC. The only alternative for SEOC GIS staff was to contact the GIS lead in each county to ask for access to road closure data, if available. Road closures existed in most of the 32 counties that would eventually receive a federal declaration. Contacting individual counties was time consuming, and after discussing the request with a handful of counties, SEOC GIS staff determined that this approach was unworkable for the reasons described below.

- The sheer number of counties to contact was impractical. SEOC had 1-4 GIS staff working at any given time. Many county EOCs had little to no GIS staff. As a result, contacting some local GIS staff took hours, and in some cases, days, especially on weekends.

- Counties tracked road closures in different formats (e.g., GIS, PDF). SEOC GIS staff had to translate road closure data manually into the SEOC GIS system. In some counties hundreds of road segments were involved, and the workload was overwhelming.

- Counties updated their information on different schedules. It was impossible to keep up with the changes coming in from multiple local sources in multiple formats.

Ultimately, SEOC staff and responders were advised to consult each of the 32 counties' web pages for road closure updates and maps. Lack of a statewide road network and closure information hindered public information efforts and prohibited any potential vehicle routing and re-routing activities throughout the event.

This historical timeline describes major events influencing the development and implementation of geospatial data, tools and applications in Wisconsin, specifically related to public safety and emergency response. The timeline also notes where recurring geospatial information sharing challenges were identified. Much of this information is extracted from the 2013 report, *Land Records Modernization – 50 Years and Counting* (http://nationalcad.org/2013/04/land-records-history/).

1970s

- Wisconsin quickly becomes one of the national leaders in the field of GIS based on early adoption and work conducted by the University of Wisconsin – Madison.

- **1978:** The University of Wisconsin – Madison and Wisconsin Department of Administration produce a report titled, *Land Records: The Cost to the Citizen to Maintain the Present Land Information Base – A Case Study in Wisconsin* (aka "Larsen Report"). This report identifies seven technical and institutional challenges to accessing and integrating geospatial information, as well as potential costs and funding mechanism related to the creation and maintenance of critical geospatial information.

1980s

- **1985:** Wisconsin Governor Anthony Earl creates the "Wisconsin Land Records Committee" (WLRC) via Executive Order 79. WLRC is directed "to examine and address the immediate needs of state and local agencies regarding land records collection and management, and to develop recommendations on how Wisconsin should approach the long-term issues of land records modernization." (http://docs.legis.wisconsin.gov/code/executive_orders/1983_anthony_earl/1985-79.pdf)

- **1987:** the WLRC delivers its final report that recommends creating a Wisconsin Land Information Program (WLIP), part of which establishes a grants program to assist counties and municipalities in the development of "foundational" geospatial information.

- **1989:** Wisconsin Land Information Program (WLIP) legislation passes and includes two funding mechanisms based on deed recording fees: (1) a grants program and (2) retained county funding. WLIP becomes the primary mechanism for funding the geospatial activities at the county level. Since 1989, counties have received over $185 million in WLIP funds (http://www.doa.state.wi.us/docview.asp?docid=10532&locid=9).

1990s

- While major academic institutions and government entities are early adopters of GIS, public safety and emergency management do not begin to utilize geospatial data and tools until much later. Geospatial data and technologies begin finding their way into domestic operations and crime analysis situations.

- **1994:** President Clinton signs Executive Order 12906 creating the National Spatial Data Infrastructure (NSDI) which is intended to create a national framework for information sharing (http://www.archives.gov/federal-register/executive-orders/pdf/12906.pdf). The NSDI authority was limited to the federal government. However, through the NSDI program, grants were provided to states to help them facilitate data sharing and develop state approaches to contribute to the NSDI. After almost 20 years this effort has mixed

results, and Wisconsin currently lacks a mechanism to contribute its geospatial information to the NSDI.

2000s

- **2001:** The September 11, 2001 terror attacks (9-11) on New York and the Pentagon require reliance on geospatial information and GIS for operational aspects of response, recovery and crime analysis. In fact, 9-11 exposes the need for information sharing especially at "Ground Zero" where a makeshift EOC was established. GIS became such a focal point that people had to scramble to institute information sharing policies and procedures, costing precious time and affecting response efforts (http://www.ctg.albany.edu/publications/reports/wtc_lessons). Since 9-11, GIS has become an important tool for national disaster response events such as Hurricane Katrina, the Space Shuttle Columbia disaster and, more recently, Hurricane Sandy. GIS is also being integrated into many state and local operations, with most states and major urban areas having some type of GIS support function.

- **2005:** Wisconsin Emergency Management (WEM), a division in the DMA, contracts for development of a GIS needs assessment. This assessment identifies GIS information sharing as a major obstacle in accessing GIS information, and recommends that data sharing agreements, standards and policies be established to ensure efficient data sharing among state and local partners. (*Wisconsin Emergency Management GIS Needs Assessment*, ESRI, July 2005)

- **2006:** The Wisconsin Land Information Association (WLIA) Emergency Management Task Force (EMTF) produces a final report calling for the adoption of standard data sharing policies, and a statewide system for sharing geospatial information in support of the emergency management community (http://www.wlia.org/wp-content/uploads/2013/12/task_force_em_final_report.pdf).

- **2008:** The Wisconsin Supreme Court takes up the case of WIREData Inc. vs. Village of Sussex (http://www.nsgic.org/public_resources/DSWGL_2_2008-WI-69-Supreme-Court-Decision.pdf) regarding access to government GIS data. After seven years of litigation, the Court issues an opinion that also strongly implies that Wisconsin Open Records laws may not offer enough specific guidance on access to information generated by technology such as GIS.

2010s

- **2013:** Act 20 (http://docs.legis.wisconsin.gov/2013/related/acts/20) passes and amends the WLIP to increase funding in the 2013-2015 biennial budget to (1) help counties complete and provide access to local parcel data and (2) help Wisconsin to plan for and create a "statewide digital parcel map". Yet as significant as the WLIP is today, virtually nothing addresses the issue of data sharing

- **2013:** The State Agency Geospatial Information Committee (SAGIC) begins researching geospatial inventory, portal and repository options to support government-to-government geospatial information exchange

- **2013:** The Wisconsin Geographic Information Coordination Council (WIGICC) begins working on a proposal for a Wisconsin government-to-government geospatial data "exchange" mechanism. This includes development of a standard geospatial information sharing agreement format to be used by all "exchange" participants.

- Wisconsin geospatial professionals participate in and follow various national organizations, which are focusing on improving and promoting GIS information sharing practices within and among government entities. Examples:

  o Urban and Regional information Systems Association (URISA): http://www.urisa.org/clientuploads/directory/GMI/Advocacy/URISA%20Advocacy%20Agenda%20_2.pdf

  o National States Geographic Information Council (NSGIC): http://www.nsgic.org/public_resources/NSGIC_Data_Sharing_Guidelines_120211_Final.pdf

  o National Alliance Public Safety GIS (NAPSG) Foundation: http://www.napsgfoundation.org/about/overview

  o National Information Sharing Consortium (NISC): http://nisconsortium.org

- Statute 66.1102(4) **LAND INFORMATION RECORD REQUESTS.**
  - Whenever any office or officer of a political subdivision receives a request to copy a record containing land information, the requester has a right to receive a copy of the record in the same format in which the record is maintained by the custodian, unless the requester requests that a copy be provided in a different format that is authorized by law.

- Statute 59.72 **Land Information**
  - s. 59.72(2)DUTIES.(a): "If the county has established a county assessor system under s. 70.99, the board shall provide Internet access to countywide property tax assessment data, and, if the county maintains land records that identify the zoning classification of individual parcels, the board shall post on the Internet land records that identify the zoning classification of individual parcels."
  - s. 59.72(5)(3): "…$2 of each $8 fee retained under this paragraph for the provision of land information on the Internet…"

- Statute 16.967 **Land information program**
  - s. 16.967(7)(a)1. "…and to make public records in the system accessible on the Internet before using these funds for any other purpose."
  - s. 16.967(7) AID TO COUNTIES.(a) "…and make public records in the land information system accessible on the Internet before the county may expend any grant moneys under this paragraph for any other purpose…"

- Wisconsin Land Information Program **Grant Agreement** (since 2006)
  - Article 4. PUBLICATIONS: "All materials produced under this Agreement shall become the property of the Grantee and may be copyrighted in its name, but shall be subject to the Wisconsin Public Records Law, Wis. Stat. 19.21 *et seq*. The Department reserves a royalty-free, nonexclusive and irrevocable license to reproduce, publish, otherwise use, and to authorize others to use the work for government purposes."

- s. 19.31, Wis. Stats. (**Open Records Law)**:
  - "…Further, providing persons with such information is declared to be an essential function of a representative government and an integral part of the routine duties of officers and employees whose responsibility it is to provide such information. To that end, ss. 19.32 to 19.37 shall be construed in every instance with a presumption of complete public access, consistent with the conduct of governmental business. The denial of public access generally is contrary to the public interest, and only in an exceptional case may access be denied."

9-11	September 11, 2001 terror attacks
DATCP	Department of Agriculture Trade and Consumer Protection
DMA	Department of Military Affairs
DNR	Department of Natural Resources
DOA	Department of Administration
DOJ	Department of Justice (Wisconsin)
DVD	Digital Versatile Disc
EMTF	WLIA Emergency Management Task Force
EOC	Emergency Operations Center
EPCRA	Emergency Planning and Community Right-to-Know Act
ESF	Emergency Support Function
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FTP	File Transfer Protocol
GIS	Geographic Information System
ICS	Incident Command System
NAPSG	National Alliance Public Safety GIS
NIMS	National Incident Management System
NISC	National Information Sharing Consortium
NRF	National Response Framework
NSDI	National Spatial Data Infrastructure
NSGIC	National States Geographic Information Council
PDF	Portable Document Format
SAGIC	State Agency Geospatial Information Committee
SEOC	State Emergency Operations Center
URISA	Urban and Regional Information Systems Association
WEM	Wisconsin Emergency Management
WERP	Wisconsin Emergency Response Plan
WIGICC	Wisconsin Geographic Information Coordination Council
WLIA	Wisconsin Land Information Association
WLIP	Wisconsin Land Information Program
WLRC	Wisconsin Land Records Committee

APPENDIX E. MISSOURI EVENT MATRIX

Produced by the State of Missouri Department of Public Safety

GIS NEEDS BY EVENT TYPE 12/18/2013

FOR STATE EOC SUPPORT	SNOW/ICE	FLOOD	TORNADO	EARTHQUAKE	NUCLEAR	TERRORIST	HEALTH OUTBREAK	AG OUTBREAK	DROUGHT	LOCAL SAR	OUTSTATE EVACUATION
FACILITIES											
ADULT DAY CARE	X	X	X	X	X	X					
AIRPORTS			X	X							X
CEMETARIES		X		X							
CHEMICALS -RMP/TIER II		X	X	X		X					
CORRECTIONAL FACILITIES - YOUTH	X	X	X	X	X		X				
CORRECTIONAL FACILITIES	X	X	X	X	X	X	X				
DAY CARE CENTERS	X	X	X	X	X	X	X				
DAMS -STATE/FEDERAL		X	X	X		X					
DENTIST			X	X							
DIALYSIS CENTERS	X		X	X							
FIRE STATIONS			X	X							
HAZ WASTE GENERATORS	X	X	X	X		X					
HELIPORT		X	X	X		X					
HOMES WITH BASEMENTS			X	X		X					
HOSPITALS	X	X	X	X	X	X	X				
NUCLEAR PLANTS			X	X	X	X					
NURSING HOMES	X	X	X	X							
PDW SYSTEMS	X	X	X	X	X	X					
PDW TREATMENT PLANTS	X	X	X	X	X	X					
PDW WELLS		X	X	X	X	X					
PET SHELTERS	X	X	X	X	X	X					
PHARMACIES			X	X							
PLACES OF WORSHIP (POSSIBLE INDE	X	X	X	X		X					
POWER PLANT	X	X	X	X							
PUMPING STATONS	X	X	X	X							
RESTAURANTS (INSPECTIONS)	X	X	X	X	X						
SCHOOL BUS ROUTES						X					
SCHOOLS	X	X	X	X	X	X					
SHELTERS	X	X	X	X	X	X					X
SINKHOLES				X							
WASTE WATER TREATMENT PLANTS	X	X	X	X							

GIS NEEDS BY EVENT TYPE 12/18/2013

FOR STATE EOC SUPPORT	SNOW/ICE	FLOOD	TORNADO	EARTHQUAKE	NUCLEAR	TERRORIST	HEALTH OUTBREAK	AG OUTBREAK	DROUGHT	LOCAL SAR	OUTSTATE EVACUATION
EVENT SPECIFIC DATA											
ACCESS CONTROL POINTS (NUCLEAR)					X						
AFFECTED AREAS					X						
BUILDING DAMAGE ASSESSMENTS		X	X	X		X					
BURN BANS - COUNTY									X		
BUSINESS IMPACT ANALYSIS		X	X	X							
COUNTY STATUS	X	X	X	X			X				
COUNTIES WITH DISASTER DECLARATI	X	X	X	X	X		X	X	X		
CRITICAL FACILITES WITH GENERATOR	X	X	X	X							
DAMAGE COST ESTIMATES (PA)	X	X	X	X	X			X			
DAMAGE AREA - DETAILED	X	X	X	X		X					
DAMAGE PATH/AREA - PROPOSED			X	X		X					
DEBRIS REMOVAL AREAS			X	X							
EMBARGO AREA					X			X			
EMERGENCY PLANNING ZONE					X						
EVACUATION ROUTES				X	X						X
EVACUTION AREAS		X	X	X	X	X	X	X			
EVENT LOCATION W BUFFER AREAS			X	X	X	X	X	X		X	
FATALITY LOCATIONS	X	X	X				X	X			
FIRE LOCATIONS			X			X			X		
FLOOD EXTENTS - CURRENT POLYGON		X		X							X
HEALTH CASE LOCATIONS		X	X	X			X	X			
INCIDENTS (TRAIN DERAILMENTS, FIR	X	X	X	X	X	X			X		
MAPBOOKS FOR FIELD TEAMS	X	X	X	X	X	X			X	X	
MODOT TRAVELER'S INFORMATION M	X	X		X							
PA/IA Requests, status	X	X	X	X	X			X	X		
PARCELS		X	X	X		X				X	
POPULATIONS - CENSUS		X	X	X	X						
POWER OUTAGE	X		X	X							
RESOURCE BY FUNDING SOURCE	X	X	X	X							
RESOURCE REQUEST STATUS	X	X	X	X			X				
ROAD CLOSURES (POINT, LINE)	X	X	X	X		X					X
SAFE BUILDINGS FOR RESPONDERS		X									
SEARCH AND RESCUE GRIDS		X	X	X						X	
STORM REPORTS - SPC		X	X								
STREET MAPS - DETAILED			X							X	
WEATHER RADAR	X	X	X								
WIND DIRECTION					X						

FOR STATE EOC SUPPORT	SNOW/ICE	FLOOD	TORNADO	EARTHQUAKE	NUCLEAR	TERRORIST	HEALTH OUTBREAK	AG OUTBREAK	DROUGHT	LOCAL SAR	OUTSTATE EVACUATION
EVENT RESOURCES											
COMMUNICATIONS TRAILERS	X		X	X		X					
DONATION DROPOFF		X	X								
FOOD/WATER DISTRIBUTION	X	X	X	X							
LOGISTICS STAGING AREA (LSA)	X	X	X	X		X					
POINT OF DISPENSING, DHSS							X				
POINT OF DISTRIBUTION (EQUIPMENT	X	X	X	X	X	X					
RECEPTION & CARE CENTER (RCC)					X						
RESPONDER RECEPTION CENTERS	X	X	X	X	X	X				X	
SHELTERS - TEMPORARY	X	X	X	X	X						X
SUPPLIES (I.E. SANDBAGS)		X	X	X							
VOLUNTEER RECEPTION CENTER		X	X	X							
WARMING CENTERS	X										
DMAT (MEDICAL)			X	X		X	X	X			
TEMPORARY MORGE		X	X	X	X	X	X				
MEDICAL SUPPLY STAGING		X	X	X	X	X	X				
MOBILE MEDICAL UNIT			X	X		X	X				
EMS STRIKE TEAMS			X	X	X	X					
SACC (STATE AREA COORDINATION C	X		X	X		X					
STAGING AREA	X	X	X	X	X	X				X	

FOR STATE EOC SUPPORT	SNOW/ICE	FLOOD	TORNADO	EARTHQUAKE	NUCLEAR	TERRORIST	HEALTH OUTBREAK	AG OUTBREAK	DROUGHT	LOCAL SAR	OUTSTATE EVACUATION
HYDROLOGY											
FLOOD 1993/2008 BOUNDARIES		X			X						
USACE HIGH FLOW ESTIMATES		X									
RIVER STAGE LEVELS		X		X					X		
RIVER LEVELS - FORECASTED		X		X					X		
FLOOD EXTENTS -HISTORIC (1993, 2008)		X									
LEVEE BREACH		X		X							
LEVEE LOCATIONS		X		X							

FOR STATE EOC SUPPORT	SNOW/ICE	FLOOD	TORNADO	EARTHQUAKE	NUCLEAR	TERRORIST	HEALTH OUTBREAK	AG OUTBREAK	DROUGHT	LOCAL SAR	OUTSTATE EVACUATION
IMAGERY											
CIVIL AIR PATROL PHOTOS	X	X	X	X		X					
SATELLITE IMAGERY- EVENT		X		X							
AERIAL IMAGERY - PRE EVENT		X	X	X	X	X					
AERIAL IMAGERY - POST EVENT		X	X							X	
LiDAR		X	X	X		X					