



**Policy Board Members:**

Terry Schneider,  
Chairperson  
City of Minnetonka  
Metro Cities

Tom Egan,  
Vice-Chairperson  
Dakota County

Dan Cook,  
TIES

Steve Elkins,  
City of Bloomington  
Metro Cities

Dennis Hegberg,  
Washington County

Randy Johnson,  
Hennepin County

Jim Kordiak,  
Anoka County

Roger Lake,  
MAWD

Randy Maluchnik,  
Carver County

Tony Pistilli,  
Metropolitan Council

Victoria Reinhardt,  
Ramsey County

Joseph Wagner,  
Scott County

**Coordinating Committee**

Sally Wakefield,  
Chairperson  
1000 Friends of MN

Peter Henschel,  
Vice-Chairperson  
Carver County

**Staff Coordinator**

Randall Johnson

**Wednesday, April 21, 2010**

**6:00 p.m.**

**Metropolitan County Government Offices**

**2099 University Avenue, St. Paul**

(Go to <http://www.mmcd.org/directions.html> for a map and directions)

## Agenda

	<u>Page</u>
<b>1. Call to Order</b>	
<b>2. Accept Agenda</b>	
<b>3. Accept January Meeting Summary</b>	<i>action</i> 1
<b>4. GIS Technology Demonstration</b> <i>Coordinated Data Management via Internet - Council and Counties</i>	
<b>5. Action/Discussion Items</b>	
a) Regional Address Point Dataset – <i>Phase I Plan (Sally Wakefield/Mark Kotz)</i>	<i>action</i> 7
b) 2010 NSDI CAP Grant Project Update ( <i>Randall Johnson</i> )	21
c) Guidance 2010 Work Plan / Budget Refinements ( <i>Randall Johnson</i> )	<i>action</i> 23
d) Glossary of GIS and Geospatial Terms ( <i>Sally Wakefield</i> )	<i>action</i> 45
<b>6. Next Meeting</b> July 21, 2010	
<b>7. Adjourn</b>	
***** <a href="#"><u>Following Reports on MetroGIS Website</u></a> *****	
<b>Major Activity Update</b>	
a) Authorized Regional Projects: <i>Address Editing Tool: Proximity Finder, Best Imager Service</i>	
b) Regional Address Point Dataset – <i>Liability Waiver</i>	
c) Next-Generation Regional Street Centerline Agreement – <i>RFP Status</i>	
d) Regional Policy Statement – <i>MetroGIS Geocoder Service</i>	
e) Performance Metrics – <i>Phase II Developing Metrics</i>	
f) Geospatial Commons – <i>Benefits of Participation and Effective Governance Structure</i>	
<b>Information Sharing</b>	
a) Mn Statewide Geospatial Advisory Council: <i>Results March 31 Meeting</i>	
b) National Geospatial Advisory Committee: <i>Results March 24-25 Meeting</i>	
c-e) Outreach and Other Metro, State and Federal Geospatial Initiatives Updates	
f) March 2010 Coordinating Committee Meeting Summary	

**Mission Statement:** "....to expand stakeholders' capacity to address shared geographic information needs through a collaboration of organizations that serve the Twin Cities metropolitan area."

**Meeting Summary**  
**MetroGIS Policy Board**  
**Metropolitan Counties Government Center**  
**2099 University Avenue, St. Paul**  
**January 27, 2010**

**1. CALL TO ORDER**

Chairperson Schneider called the meeting to order at 6:09 p.m.

Members Present: Dan Cook (School Districts - TIES), Randy Knippel for Tom Egan (Dakota County), Steve Elkins (Metro Cities – City of Bloomington), Randy Maluchnik (Carver County), Jim Kordiak (Anoka County), Roger Lake (Metro Watershed Districts), Gary Swenson for Randy Johnson (Hennepin County), Molly O’Rourke for Dennis Hegberg (Washington County), Dave Hinrichs for Tony Pistilli (Metropolitan Council) and Terry Schneider (Metro Cities - City of Minnetonka). Coordinating Committee Chairperson Sally Wakefield attended in the capacity of a non-voting, ExOfficio member.

Members Absent: Victoria Reinhardt (Ramsey County) and Joseph Wagner (Scott County)

Coordinating Committee Members Present: Jim Bunning, Rick Gelbmann, Randy Knippel, Tim Loesch, Nancy Read, Mark Vander Schaaf, Sally Wakefield, and Vice Chairperson Peter Henschel.

Support Staff: Randall Johnson

Visitors: Will Craig ( U of M CURA), David Arbeit (MNGeo), Lezlie Vermillion Scott County Deputy Administrator and Public Works Division Director, and Marilyn McCarter, Scott County CIO.

**2. ACCEPT AGENDA**

Member Kordiak moved and Alternate Member Hinrichs seconded to approve the agenda, as proposed. Motion carried, ayes all.

**3. MEETING SUMMARY**

Member Kordiak moved and Alternate Member Hinrichs seconded to approve the October 14, 2009 meeting summary, as submitted. Motion carried, ayes all.

**4. GIS TECHNOLOGY DEMONSTRATION**

*How Use of Shared Web Services is Improving Organizational Efficiencies* was the topic of the demonstration. Chairperson Schneider informed the members this demonstration was developed in part of provide context for Agenda Item 5a.

Nancy Read, Metropolitan Mosquito Control District (MMCD) Technical Manager and member of the Coordinating Committee, introduced the topic by explaining what a web service is by using the example of the regional geocoding service that was developed under her direction as a MetroGIS funded project and the subject of Agenda Item 5a. Her explanation included the importance of the types of data (parcels, street centerlines, landmarks, and the pending address points dataset) and their characteristics to the ability of the geocoding service to return accurate map coordinates for addresses processed by the service. Read also acknowledged that when the Policy Board authorized MetroGIS funding to add a landmark extension to the regional geocoder functionality that Board members had raised questions as to which landmark database would be appropriate. She then showed map-based examples of the pros and cons of several of the best landmark data options and shared that the Geocoder Service Workgroup had concluded that the best option was the Landmark component of the NCompass Street Centerline Dataset. It was also noted that the Workgroup is considering teaming up with individuals associated with Open Street Map to explore options to improve the quality of landmark data. Chairperson Schneider asked if it would be possible to create a filter to allow the best aspects of multiple sources to be leveraged. Read responded that all options on the table but reiterated that the service is providing value under the current setup.

Read concluded her remarks by noting that as a result of the availability of the regional geocoding service, MMCD has greatly improved efficiencies related to processing of information received by phone

from the public. She offered that updating the regional parcel dataset more frequently than quarterly could further improve the efficiency of the service and that the workgroup is investigating a way to effectively inform users when programming changes are made to the code that operates the geocoder service. [Click here](#) to view Ms. Read's presentation slides.

Jim Bunning, Scott County GIS Manager and member of the Coordinating Committee, demonstrated a crime mapping application used by Scott County officials that incorporates the regional geocoding service explained by Ms. Read. The purpose of his demonstration was to help Policy Board members gain a better understanding of MetroGIS's objective to act on the motto build once and use by many. [Click here](#) to view Mr. Bunning presentation slides. Tim Loesch, DNR GIS Manager and member of the Coordinating Committee, closed the demonstration with a general overview of how web services are an essential component of DNR's geospatial technology enterprise. He showed a few examples of how use of web services is greatly improving efficiencies related to data acquisition and management. [Click here](#) to view Mr. Loesch's presentation slides.

## 5. ACTION/DISCUSSION ITEMS

### a) **Geocoder Service Enhancements – Accept Final Reports**

Coordinating Committee Chair Wakefield explained that the Coordinating Committee had recommended acceptance of the final project reports, as presented in the agenda report.

Member Kordiak asked about the significance of approving these final reports. Staff Coordinator Johnson explained that submission of a final project report is a requirement of the funding that MetroGIS provided for each project. These reports document the projects, what worked, what could be improved upon, and document recommendations for future action to resolve issues and or opportunities identified during these projects.

**Motion:** Member Kordiak moved and Member Cook seconded to accept the final project reports for enhancements made to the MetroGIS Geocoder Service that are presented in Attachments C (Landmark Extension) and D (Improve Performance with Local Data) , as recommended by the Coordinating Committee.

Motion carried, ayes all.

### b) **Accomplishments in 2009**

Staff Coordinator Johnson introduced the topic by commenting that from time questions have been raised that go to the big picture of MetroGIS's purpose, major functions, and major accomplishments. In response, he touched on each of these topics in a [presentation](#) to provide context for both the report to the Policy Board on accomplishment in 2009 (Item 5b) and the report for the recommended 2010 work plan and budget (Item 5c).

Johnson's concluded his comments with a brief summary of the major accomplishment during 2009, obstacles that had been encountered and remedial action that had been/was being pursued to address them. Chairperson Schneider commented that as MetroGIS's efforts have transitioned from a focus strictly on shared data needs to also addressing shared application needs that chances are better that one's ability to comprehend how they might be able to leverage collaborative solutions to accomplish more with less. He concluded his comment by stating that he is confident that solutions accomplished through MetroGIS's effort will get a lot more attention given the realities of the financial environment that we all have to deal with.

**Motion:** Member Kordiak moved and Member Elkins seconded to:

- 1) Accept the listing below of MetroGIS's major accomplishments during 2009.
- 2) Recognize that the Technical Leadership Workgroup has performed an extremely valuable service over the past year but cannot be expected to function at the level expected of dedicated support.

Motion carried, ayes all.

There was no discussion of Recommendation 3 from the Coordinating Committee other than Chairperson Schneider encouraged the members to think about ways to help the Coordinating Committee overcome technical support limitations needed to expedite priority projects important to maintaining relevancy to changing stakeholder needs.

**c) Budget/Objectives for 2010**

Coordinating Committee Chair Wakefield reported that the Coordinating Committee had recommended the Board's approval of the 2010 work program and budget as presented in the agenda report. Staff Coordinator Johnson summarized the major program objectives for 2010 noting that they are the same as preliminary accepted at the October 2009 meeting with the exception that achieving a Next Generation Street Centerline Data Access Agreement has been added because the agreement reached in 2009 was only for 1 year. He also reported that the budget was the same as preliminary approved by the Board in October. There were no questions.

**Motion:** Member Kordiak moved and Member Elkins seconded to that the Policy Board:

- 1) Approve the 2010 program objectives presented in Attachment A of the agenda report
- 2) Approve the 2010 "Foster Collaboration" budget presented in Attachment B of the agenda report.
- 3) Agree to reevaluate the 2010 budget and work plan by mid- year if dedicated supplemental technical support resources, consistent with the work program needs, are not able to be secured.

Motion carried, ayes all.

**d) Regional Policy Statement – Socioeconomic Web Resources Page**

Will Craig, recently retired member of the Coordinating Committee, introduced himself and commented that he had chaired the workgroup that developed the MetroGIS Socioeconomic Web Resources Page that launched in 2004 and that he had recently guiding a significant upgrade to the site to integrate new data resources, in particular, private data sources.

At this point, Chairperson Schneider interrupted Mr. Craig's presentation to present him with a Certificate of Appreciation for his service as a active member of MetroGIS Coordinating Committee from its creation in February 1996 until September 2009 when he resigned to given another the allow opportunity to serve. Following a round of applause and thank you comments, Craig demonstrated how one can use the Socioeconomic Web Resources Page to discover and access data, how the site is integrated with DataFinder, and properties of data sources that were added over past year as part of the grant received from the University's Transportation Center in conjunction with a research related to light rail. He concluded his remarks by explaining the changes proposed to the Regional Policy Statement that governs the Socioeconomic Web Resources Page and confirmed that the U of M Population Center remains committed to managing the web site content.

Chairperson Schneider concurred with the recommended changes to Regional Policy Statement, given that content management of site implies an evolutionary process to update (keep current) and expand data source listings as new data become available/are discovered.

**Motion:** Alternate Member O'Rourke moved and Member Elkins seconded to that the MetroGIS Policy Board:

- 1) Concur with the Coordinating Committee's finding that as the Socioeconomic Web Resources Page now includes data that was originally intended to be part of a Phase II effort, and the University of Minnesota Population Center (designated custodian) is committed to continuing to monitor opportunities to improve upon the resources searchable – public and private, that the Phase I label and related language should be officially removed from the Regional Policy Statement, as illustrated in Attachment A of the agenda report.
- 2) The members, if not currently aware, are encouraged to become familiar with the Socioeconomic Web Resources Page and encourage broader use via their respective interest groups.

Motion carried, ayes all.

**e) Minnesota Geospatial Advisory Council (MGAC) – Summary 1st Meeting**

Chairperson Schneider introduced this topic by calling to the Board’s attention that several of its members had been appointed to the newly created Minnesota Geospatial Advisory Council (MGAC), one of two Councils that advise the Mn Chief Geographic Information Officer. He then introduced David Arbeit, Mn Chief Geographic Information Officer and member of the Coordinating Committee, to summarize events that led to the creation of the Mn Office of Geographic Information (MnGeo) in May of 2009, which he directs, its mission, its structure, and his general expectations for how it will function. He concluded his introductory comments by noting that there is now a home for several issues with which MetroGIS has grappled and which have ramifications broader than the metro area. He also stated that lessons learned through MetroGIS’s efforts can and will be leveraged, encouraged MetroGIS representatives to call attention to issues and opportunities that MnGeo should be paying attention, and reported that among the first actions of the MGAC was approval of a letter of support for a 2010 federal grant proposal from the MetroGIS community. Staff Coordinator Johnson provided a brief summary of the proposal (see [http://www.metrogis.org/teams/pb/meetings/10\\_0127/InfoShared.pdf](http://www.metrogis.org/teams/pb/meetings/10_0127/InfoShared.pdf) ).

Following Arbeit’s comments, Chairperson Schneider commented that MetroGIS is well represented on the MGAC with 6 out of the 23 members and that former MetroGIS Policy Board Chairperson Reinhardt has agreed to serve as the first chairperson of the MGAC.

Alternate member Knippel asked Mr. Arbeit to explain the major differences between MnGeo and LMIC and between the Governor’s Council on Geographic Information (CGGI) and the MGAC. His response was as follows:

	<u>Then</u>	<u>Now</u>
	<u>LMIC</u>	<u>MnGeo</u>
Legislative Mandate:	No	Yes
Authority to Act	None	Yes
Formal budgetary status	No	Yes
Influence Legislative priority setting	No	Yes
	<u>GCGI</u>	<u>MGAC</u>
	Existed by Executive Order	Created by Statute
Budget	No	Yes
Formal Coordination Role	No	Yes (mandate with several of “musts”)

Arbeit closed by stating he believes that the existence of MnGeo, together with MGAC, create a platform from which to effectively advocate for Legislative initiatives. He also mentioned that Legislators are now more aware of the value of using geospatial technology and have becoming more map savvy.

Chairperson Schneider closed the discussion with a comment that believes the progress can be made to effective deal with geospatial coordination issues and opportunities issues for three major reasons:

- There is a better understanding of the need to and value of collaborating
- Advancements in technology
- Evolution of understanding in the Legislature of the value what can be accomplished with geospatial technology.

**f) Suggestions for Consideration by MGAC/MnGeo**

Coordinating Committee Chairperson Wakefield summarized the five topics listed in the agenda report that the Coordinating Committee had identified to pass along for consideration by the MGAC. David Arbeit, Mn Chief Geographic Information Officer authority to who the MGAC provides advise, explained that 4 of the 5 topics are currently being worked on by MnGeo associated committees and workgroups. He agreed to make sure that MetroGIS leadership is

apprised of these efforts. He conceded that the topic – Access to Licensed Data (publicly and privately-produced) by Emergency Responders” is not currently being worked on. Member Kordiak moved and Alternate Member Hinrichs seconded to ask the members of MetroGIS leadership, who are also members of the MGAC, to pass along for consideration by the full MGAC the five topics presented in the agenda report entitled “Suggestions for Consideration by MGAC/MnGeo, dated January 7, 2010.

Motion carried, ayes all.

**g) Modify remainder of 2010 Meeting Dates**

Member Kordiak introduced the request to amend the meeting dates for the remainder of 2010.

Member Elkins moved and Alternate Member Swenson seconded to amend the Policy Board’s 2010 meeting schedule to meet one week prior to the previously set dates but continue to meet on Wednesday evenings: April 21, July 21 and October 20:

Motion carried, ayes all.

**6. NEXT MEETING**

The next meeting of the Policy Board is scheduled for Wednesday April 21, 2010.

**7. ADJOURN**

Member Elkins moved and Alternate Member Swenson seconded to adjourn at 8:12 p.m.

Motion carried, ayes all.

Prepared by:  
Randall Johnson, MetroGIS Staff Coordinator





**TO:** Policy Board

**FROM:** Coordinating Committee  
Chairperson: Sally Wakefield, 100 Friends of Mn  
Staff Contacts: Mark Kotz, Chair Address Workgroup, and Randall Johnson MetroGIS  
Staff Coordinator (651-602-1638)

**SUBJECT:** Regional Address Point Dataset –Phase I Plan and Interim Policy Statement

**DATE:** April 5, 2010  
(For Apr 21<sup>st</sup> Meeting)

### INTRODUCTION

The Address Workgroup is ready to begin preliminary “Phase 1” distribution of address points data. Accordingly, the Coordinating Committee respectfully requests endorsement from the Policy Board of the following Phase 1 strategic project components:

- 1) Phase 1 workplan (*Attachment A*)
- 2) Modified interim policy statement (*Attachment B*) to govern the creation and initial operation of the proposed Regional Address Points Dataset.
- 3) Interim liability waiver (*Attachment C*) for organizations who elect to contribute address point data as part of Phase 1.
- 4) Database specifications (*Attachment D*)

Final approval of a formal regional policy statement and data specifications will not be sought from the Policy Board until Phase 1 is operational and the Workgroup has had an opportunity to evaluate for desired improvement and refine specifications, procedures and policies accordingly. (See Attachments E and F for a chronology of decision making and direction provided to date.)

### PHASE 1 WORK PLAN – DEVELOPMENT OF REGIONAL ADDRESS POINTS DATASET

The Address Workgroup proposes to begin outreach efforts following acceptance by the Policy Board of the attached policy statement. The purpose of the outreach will be to seek contributions of existing address point data beyond Workgroup member organizations.

The Phase 1 dataset will be posted on DataFinder. To simplify Phase 1, only data which is authorized to be freely accessible will be distributed. The Phase 1 dataset is expected to include only a small portion of the metro area. The Workgroup proposes to use a liability disclaimer (*Attachment C*) developed in cooperation with the MN League of Cities Insurance Trust to govern access to these early contributions until a final version is approved by the Policy Board. The Metropolitan Council has agreed to serve as regional custodian for Phase 1. (See *Attachment B* for the roles and responsibilities of the regional custodian.)

This Phase 1 distribution process will provide valuable experience from which to refine methods and policies. This process and the subject components were approved by the Committee on March 17, 2010.

### RECOMMENDATION

That the Policy Board accept the following strategic Phase I components of the proposed Regional Address Points Dataset, with the understanding that Policy Board acceptance will be sought prior to completing Phase 2:

- 1) Phase 1 workplan (*Attachment A*)
- 2) Interim policy statement (*Attachment B*) to govern the creation and initial operation of the proposed Regional Address Points Dataset.
- 3) Interim liability waiver (*Attachment C*) for organizations who elect to contribute address point data as part of Phase 1.
- 4) Database specifications (*Attachment D*)

## ATTACHMENT A

2009-2010 Work Plan *Updated based on the January 27, 2010 Workgroup meeting*

### Phase 1 - Steps to get to Initial Data Distribution: Simple Open Access FTP Distribution

Step		Description	Status
1	✓	Have a willing preliminary distributor	Met Council is willing to distribute via FTP
2	✓	Finalize draft data specifications and publish (to be reviewed once National Standard is approved)	Revisions approved at February meeting
3	✓	Have interim liability disclaimer	Approved at January meeting
4	✓	Have preliminary registry of address authorities that are contributing data	Draft exists. Will modify once address authorities begin participating
5	✓	Have accurate metadata for dataset as a whole, with link to contact info for each authority or their designated data maintainer (info in registry)	Revised draft approved at January meeting
6		Have address authorities contributing data for distribution	Build it and they will come
7		Ensure that address authorities verify their ability to provide data for Open Access distribution as to not violate existing data license agreements	Counties and cities working on this.
8		Distribute data on DataFinder	

### Phase 2: Steps to get to fully implementing the MetroGIS Vision: Phase 2

Step		Description	Status
1		Have a regional custodian organization	Metropolitan Council is a willing volunteer.
2		Have MetroGIS approved disclaimer language	PB Chair Schneider and CC member Ben Verbick working on this with LMCIT
3		Get approval from CC and Policy Board to distribute data, at least for data providers that want the open access option	Draft policy statement for dataset exists, pending completion of some of the details in this list of steps.
4		Evaluate possibility of distributing in different formats (e.g. KML) and web services	
5		Have synchronizer operational between 1 or more counties and regional custodian	
6		Have online web editing application operational	
7		Counties may need it get board approval to make a subset of their address points starter kit data feely available to cities with the ability to freely redistribute.	
8		Have legal issues with limited access distribution finalized (if option is wanted)	
9		Have clearly documented conditions for when a city's address points data is or is not bound by the parcel data licenses	
10		Have an outreach effort to encourage address authorities to participate	

## REGIONAL ADDRESS POINTS DATASET BUSINESS INFORMATION NEED POLICY SUMMARY

### Preamble:

*Official Address Authorities (primary custodians) are responsible for providing only the address points data and attributes that they maintain for their own internal business purposes and which can be retrieved and provided to the regional custodian without an excessive level of effort. A guiding principle of MetroGIS is that no organization will be asked to perform a task for the MetroGIS community for which it does not have an internal business need. Within these bounds, it is expected that each primary custodian will work toward providing the most complete dataset practical. Intermediate aggregators must not alter data submitted by the primary custodians unless authorized to do so by the primary custodian. Intermediate aggregators and regional custodians must not alter data submitted by the primary custodians or intermediate aggregator to the regional dataset. Gaps may continue to exist between defined data needs and available data. MetroGIS will work to identify solutions that bridge these gaps for the broad MetroGIS community.*

*Approval is required from the Policy Board prior to modifying any component of this policy summary.*

## *Address Points – Regional Data Specifications*

### REGIONAL ADDRESS POINTS DATASET - OVERVIEW

This dataset comprises address point data that are standardized and integrated across the seven-county, Minneapolis-St. Paul metropolitan area, complete with geographic coordinates and a unique identifier for each address point.

These data are to include the officially assigned address for each residential and non-residential occupiable unit in the region and any other addresses assigned to infrastructure or other geographic features by the Official Address Authority<sup>1</sup> for a given area. Ideally, this dataset will be updated by local address authorities as soon as a new address is created or modified (e.g. building permit is issued).

County, regional and state government entities may act as intermediate, regional or state aggregators of the data. MetroGIS will designate a regional custodian that will combine the multiple point datasets into a single regional dataset and provide access to it in accordance with approved data access policies.

### DESIRED DATA CONTENT

The MetroGIS Regional Address Points data specifications are presented in Exhibit 1 and are part of this official policy summary. To increase interoperability both within and beyond MetroGIS, these data specifications are intended to be interoperable with the National Address Data Standard once it is officially adopted (in draft form on August 11, 2009). MetroGIS's address points data specifications are preliminary until the national standard is adopted, at which time, refinements to the MetroGIS specifications may be needed.

Official Address Authorities that contribute to the Regional Address Points Dataset are free to utilize any hardware, software or database design they choose, provided they are able to export their data into the MetroGIS transfer format.

<sup>1</sup> Official Address Authority means the government organization authorized to create or assign addresses for a particular jurisdiction.

# Address Points – Roles and Responsibilities

## A. Primary Custodian

Responsibility for the primary (source) data and its maintenance shall remain with each official address authority (city or county). These primary custodians shall be the single source of address points for the area within their jurisdiction.

Multiple methods to input address data to the regional dataset are available for use by local address authorities (e.g., web-based application, FTP). Varying levels of spatial accuracy are acceptable provided the method of data creation is documented in accordance with the data specifications.

### Responsibilities

1. Update the primary address points dataset on a continuous basis.
2. Make the address points dataset available to an intermediate aggregator or the regional custodian, preferably on a daily basis, and in conformance to the MetroGIS address points data specifications. Such specifications include, data file schema (field name, length and type). *It is understood that optional attribute fields will be populated at each address authority's discretion.*
3. Provide and periodically update information about the content and completeness of the data (metadata).
4. Provide a contact person for the dataset.

## B. Intermediate Aggregator

With the consent of the primary custodians involved, some organizations may choose to serve in the role of intermediate aggregator which may consist of one or more of the following functions:

- Assist multiple primary custodians with their responsibilities to varying degrees
- Compile data from multiple primary custodians for submission to the regional custodian
- Act as a technical resource to primary custodians
- Accept the role of editing organization when authorized by primary address authority
- Host an online address points maintenance application that can be used by addressing authorities.

## C. Regional Custodian

*(A regional custodian has yet to be determined. The Project Plan will provide for the possibility of an interim custodian role to initiate development.*

### Responsibilities

1. Host an online address points maintenance application that can be used by addressing authorities.<sup>2</sup>
2. Accepting data from primary custodians (official address authorities) and intermediate aggregators on a daily basis.<sup>3</sup> **Note:** *As a matter of MetroGIS policy, the regional custodian shall **not** change the address points data received from the address authorities. The primary custodians, shall be the only entities authorized to modify address point data as it pertains to the regional dataset.*
3. Host an automated process to compile daily changes to the local address point data into the regional dataset, including, but not limited to, the following procedures:
  - a) Adding and testing uniqueness of regional unique identifier

<sup>2</sup> Some counties may also host such an application for their local address authorities. This may involve some user support such as setting up accounts and helping users to get started. This also will likely include some administrative work related to adjustments when annexations occur and affected point records change jurisdiction to a different address authority. MetroGIS is in the process of contracting for the development of a prototype application.)

<sup>3</sup> Several counties expect to aggregate the address points dataset for all cities within their border. The desire is for the regional custodian to be able to accept changes from any authorized source in an automated way on a daily basis. (MetroGIS has partnered with Carver County to create an automated data synchronization process.)

- b) Testing the dataset to see that it meets these aspects of the regional dataset specifications
    - \* ~~(schema structure (field name, width, type and order) and valid code testing).~~
    - \* Uniqueness of unique IDs
    - \* Address Authority field contains valid entries
  - ~~b)c) Inform the primary custodian where a primary dataset does not meet these data specifications and request a corrected datasets. differs from a MetroGIS endorsed standard.~~
  - e)d) Compile and publish metadata for the regional dataset, including contact information for each primary custodian.
    - ~~d) Periodically test to verify that unique identifiers for address points are in fact unique metro wide.~~
4. Provide for data archive, backup, retrieval, and disaster recovery.
  5. Provide for distribution of the dataset to authorized users. Exact distribution methods are yet to be determined. It is thought that both FTP and a web mapping services (WMS/WFS) will be needed.
  6. Support distribution of one annual version of the address points dataset for each year, as determined by MetroGIS, as an annual archive along with appropriate metadata.
  7. Support a distribution process which distinguishes between the two access types (see below) and which allows all users to access the data via the same mechanism.
  8. In collaboration with MetroGIS, foster coordination among address authorities concerning contributing address data they produce to the regional dataset.
  9. Participate in a MetroGIS Data Users Forums on a schedule decided by the Coordinating Committee to obtain feedback from the MetroGIS community as to desired enhancements to the dataset and any associated data access, content, documentation and/or distribution policy(ies).

#### **D. Governance**

The number of organizations expected to assume one or more of the custodial responsibilities is unprecedented. To ensure that timely communication occurs among the many participating organizations and that problem solving occurs in a timely manner, a proactive governance and communication mechanism is needed. It should include the following characteristics:

- The Address Workgroup serves as an advisor to the regional custodian regarding the full range of topics that arise in the course of supporting this regional database.
- All primary custodians and intermediate aggregators are able to readily pass along to the regional custodian concerns and suggestions that arise during day-to-day operations.
- The regional custodian quickly decides if the issue or opportunity involves policy, requiring action by MetroGIS, or is limited to operational refinement.
- Primary and intermediate custodians are regularly kept apprised by the regional custodian of refinements in operational requirements and policies.
- MetroGIS leadership is kept apprised of issues and opportunities in a timely manner.

## *Address Points – Access / Distribution Policies*

Rules associated with access to the Regional Address Points Dataset, or any portion thereof, and the process to define these rules shall be approved by the MetroGIS Policy Board. The Board's objective is to secure participation by all official address authorities that serve the seven-county, Minneapolis-St. Paul metropolitan area and, thereby, achieve and maintain complete coverage of the entire metropolitan area. To maximize participation, two policy options are offered regarding data access.

1. Open access distribution: Data is freely available to anyone who agrees to the terms of an online liability disclaimer.
2. Limited access distribution: Data are made available only to: 1) organizations that qualify to receive parcel and street centerline data without fee (government and academic organizations) and 2) organizations that serve as official first responders (e.g., ambulance providers). Such organizations must first agree to the terms of a liability disclaimer. These authorized users may

utilize these data in public facing, Internet-based applications they host, provided the user of the application cannot download the source data in a format other than an image (view-only access).

Any data contributed by an address authority to the regional dataset under this option shall be made available to qualifying organizations free of charge, but under terms and conditions that prohibit the redistribution of the data in a form other than an image format. The terms and conditions must also give authority to aggregators or regional custodians to withhold the data from unauthorized users.

## EXHIBIT 1

### ADDRESS POINTS DATABASE SPECIFICATIONS

Attach here the database specifications (currently found at [http://www.metrogis.org/data/info\\_needs/street\\_addresses/MetroGIS\\_Address\\_Points\\_Database\\_Specifications.pdf](http://www.metrogis.org/data/info_needs/street_addresses/MetroGIS_Address_Points_Database_Specifications.pdf)) prior to seeking official approval from the Policy Board, with the understanding that MetroGIS's address point database specifications will be reviewed and possibly revised when and if a national address standard is adopted.

## EXHIBIT 2

### Operational/Procedural Clarifications

#### *Business Rules for Address Points Dataset*

#### **Regional Custodian Data Validation:**

As defined at the 12/17/2009 Address Workgroup meeting:

Level 1: Regional custodian will test incoming data for the following:

1. Valid schema (field name, type, width and order matches MetroGIS specifications)
2. Unique IDs – All records have a unique IDs and all IDs are unique (no duplicates)
3. Valid address authority – the address authority is populated and valid for all records

If any of these three validation tests fail, the data **will not** be accepted and the contributor will be notified and asked to resubmit the data.

Level 2: Regional custodian will test incoming data for the following:

4. county and municipal codes are valid
5. no two records have the same complete address (all address fields combined)

If either of these two validation tests fail, the data **will** be accepted, but the contributor will be notified of the invalid data.

## ATTACHMENT C

### Proposed Interim Liability Waiver

(March 9, 2010 – Handout to Coordinating Committee)

*The following notice language was developed by the Mn League of Cities and City of Minnetonka legal counsels in cooperation with LOGIS, the Address Workgroup Chair, and MetroGIS staff.*

#### **NOTICE:**

By accessing these geographic information system (GIS) data, you agree to be bound by the terms and conditions provided below. These GIS data are made available as a public service. The data have been compiled using information received from Data Contributors including cities and counties. Data Contributors are not obligated to provide updates to data when newer versions become available. Although reasonable efforts have been made to ensure the accuracy of these data, no guarantee is given or implied.

Maps and data are to be used for reference purposes only. All users are strongly urged to independently verify these data before relying on such data. The use of these data is at the sole risk of the party using such data. Data Contributors may make changes or corrections to the data and to these conditions at any time without notice.

Data Contributors, and their officials, employees and agents, supplying these data cannot be held liable for any improper or incorrect use of the information. They assume no responsibility for any use of the information. They will not be liable for any direct, indirect, incidental, special, exemplary, or consequential damages however caused and on any theory of liability arising in any way out of the use of these data. All information is provided "as-is" without any warranty of any kind. All warranties of any kind, express or implied, such as merchantability and fitness for a particular purpose, are specifically disclaimed.

User agrees to defend, indemnify, and hold harmless, the Data Contributors, and their officials, employees and agents from and against all claims and expenses, including attorneys' fees, arising out of the use of these data.

This agreement is governed by the law of Minnesota, and any lawsuits involving this agreement or use of these data must take place in Minnesota. This agreement is the exclusive statement of the agreement between the parties and may be modified only by a written agreement.

By using these data, the user acknowledges that the above conditions have been read and that the user is bound by them.

## ATTACHMENT D

### Database Specifications

Overview provided here. Detailed specifications available at [http://www.datafinder.org/metadata/MetroGIS\\_Address\\_Points\\_Database\\_Specifications.pdf](http://www.datafinder.org/metadata/MetroGIS_Address_Points_Database_Specifications.pdf)

#### **MetroGIS Address Points Database Specifications**

Approved by the MetroGIS Address Workgroup: 02/24/2010

#### **Address Points Database Standards**

In February 2010 a new draft of the national standard was published and submitted to the Federal Geographic Data Committee as a proposed national standard.

<http://www.urisa.org/about/initiatives/addressstandard>. It is expected that the FGDC will have a formal public review period for this standard. The intention of the MetroGIS Address Workgroup is to review these specifications for possible modifications when and if a final national address data standard is approved.

The database format for the MetroGIS Address Points Dataset is derived primarily from the November 2005 published draft national standard and the February 2010 published draft national standard, as well as the combined thought and experience of the MetroGIS Address Workgroup.

In 2006 the Workgroup conducted a data pilot project to test a preliminary set of data specifications with real data in cities and counties. The results of that pilot suggested some modest changes to the data specifications, mainly with optional items, and also provided some comments on suggested changes and clarifications to the draft national standard. The specifications were modified again after the publishing of the 2010 draft national standard.

At this time, the MetroGIS specifications focus on the ability to encode address point data into a fairly simple, flat database file format (e.g. shapefile). For some database elements additional work will need to be done to specify how these elements convert to the more complex XML format of the draft national standard. A simplified XML schema will be used until a national standard is approved.

The MetroGIS Address Points Dataset will consist of a geospatial points (e.g. a point shapefile) with the following attribute fields. All fields are required to be in the dataset. Those listed as optional are not required to be populated.

All other fields are required to be populated where they apply to the address. For example, many addresses do not have occupancy types and thus occupancy type would not apply to those addresses.

### Database Fields

Draft National Standard Element	Element Name	Database Field Name	XML Tag from Draft National Standard	Field Type	Field Width	Optional
2.4.1.1	National Address Unique Identifier	ADD_ID_NAT	<AddressID>	Text	60	
2.4.1.1	Local Address Unique Identifier	ADD_ID_LOC	<MNAddressIDLocal>	Text	50	
2.2.1.1	Address Number Prefix	ANUMBERPRE	<AddressNumberPrefix>	Text	6	
2.2.1.22	Address Number	ANUMBER	<AddressNumber>	Integer	10	
2.2.1.3	Address Number Suffix	ANUMBERSUF	<AddressNumberSuffix>	Text	6	
2.2.1.4	Separator Element	ANUMBERSEP	<Separator>	Text	1	
2.2.2.1	Street Name Pre Modifier	ST_PRE_MOD	<StreetNamePreModifier>	Text	10	
2.2.2.2	Street Name Pre Directional	ST_PRE_DIR	<StreetNamePreDirectional>	Text	9	
2.2.2.3	Street Name Pre Type	ST_PRE_TYP	<StreetNamePreType>	Text	24	
2.2.2.4	Street Name	ST_NAME	<StreetName>	Text	42	
2.2.2.5	Street Name Post Type	ST_POS_TYP	<StreetNamePostType>	Text	12	
2.2.2.6	Street Name Post Directional	ST_POS_DIR	<StreetNamePostDirectional>	Text	9	
2.2.2.7	Street Name Post Modifier	ST_POS_MOD	<StreetNamePostModifier>	Text	12	
2.2.3.1	Subaddress Type 1	SUB_TYPE1	<SubaddressType>	Text	12	
2.2.3.2	Subaddress Identifier 1	SUB_ID1	<SubaddressIdentifier>	Text	12	
2.2.3.1	Subaddress Type 2	SUB_TYPE2	<SubaddressType>	Text	12	
2.2.3.2	Subaddress Identifier 2	SUB_ID2	<SubaddressIdentifier>	Text	12	
Multi	Municipal Jurisdiction Name	MUNI_NAME	<MNMuniJurisdictionName>	Text	30	
None	Municipal Jurisdiction Code	MUNI_CODE	<MNMuniJurisdictionCode >	Text	8	
Multi	USPS Place Name	USPS_PLACE	<MNUSPSPlaceName>	Text	30	Optional
None	County Code	CO_CODE	<MNCountyCode>	Text	3	
Multi	County Name	CO_NAME	<MNCountyName>	Text	20	
2.2.5.3	State Code	STATE_CODE	<StateName>	Text	2	
2.2.5.4	ZIP Code	ZIP	<ZIPCode>	Text	5	
2.2.5.5	ZIP Plus 4	ZIP4	<ZIPPlus4>	Text	4	Optional
2.4.6.8	Location Description	LOC_DESC	<LocationDescription>	Text	40	Optional
2.2.4.1	Landmark Name	LANDMARK	<LandmarkName>	Text	40	Optional
None	Residence	RESIDENCE	<MNResidence>	Text	10	Optional
2.4.6.9	Mailable Address	MAILABLE	<MailableAddress>	Text	10	Optional
2.4.6.3	Lifecycle Status	STATUS	<AddressLifecycleStatus>	Text	1	Optional
2.4.3.2	Parcel Unique Identifier	PIN	<AddressParcelIdentifier>	Text	17	Optional
2.4.2.3	Longitude	LONGITUDE	<AddressLongitude>	Real	double	
2.4.2.4	Latitude	LATITUDE	<AddressLatitude>	Real	double	
None	Positional Accuracy Indicator	POSI_ACCU	<MNPositionalAccuracy>	Integer	2	Optional
None	Address Direct Source	ADIRSOURCE	<MNDirectSource>	Text	40	Optional
2.4.1.2	Address Authority	AAUTHORITY	<AddressAuthority>	Text	40	
None	Editing Organization	EDIT_ORG	<MNEditingOrganization>	Text	40	Optional
None	Update Date	UPDATEDATE	<MNUpdateDate>	Date	8	
None	Comments	COMMENTS	<MNComments>	Text	255	Optional

## ATTACHMENT E

### Chronology of Prior Direction and Status of Prerequisite Projects MetroGIS Regional Address Points Dataset

#### **PRIOR DIRECTION AND COMMUNICATION - POLICY BOARD AND COORDINATING COMMITTEE**

- 1) **Policy Board-July 22, 2009:** The Board provided direction regarding its desired data access policy for the Regional Address Points Dataset in response to questions posed by the Coordinating Committee at its June 2009 meeting. (The specifics of direction received from the Policy Board are explained in the Reference Section and have been incorporated into the version of the Regional Policy Statement presented in Attachment A). The Board also directed the Committee to continue to refine this policy, which is one of the purposes of the action requested in this report. S

Specifically, the Policy Board granted concept approval to several foundation elements for this address points dataset policy and directed the Coordinating Committee to develop a detailed policy statement and an outreach plan to advocate for widespread acceptance among leadership of “official address authorities” (Agenda Item 5a at

[http://www.metrogis.org/teams/pb/meetings/09\\_0722/09\\_0722m\\_V3%20draft.pdf](http://www.metrogis.org/teams/pb/meetings/09_0722/09_0722m_V3%20draft.pdf)).

The statements on the following page were endorsed by the Policy Board as foundational principals for a detailed policy statement to guide MetroGIS’s efforts related to development of a regional Address Points Dataset and its distribution.

#### **Foundation Element 1: Offer the options of either open or limited access to encourage broad participation by data producers:**

Assume that cities will generally want to make their data freely available to anyone requesting<sup>4</sup> it, but for those instances where the data producer would prefer to restrict access offer a limited access<sup>5</sup> option as well, provided support overhead is not excessive.

If the restricted access option is desired by a data producer, then the following rules would apply (the users would access the data via the same mechanism which could distinguish between the access types):

- Provide full access to government and all other organizations that serve as first responders (e.g., ambulance providers) via a password protected mechanism.
- Provide “view-only” access for all other interests to ensure transparency and understanding of the resource’s existence

**Foundation Element 2: Each user would be required to acknowledge a liability disclaimer** (data provided “as is”). The exact method (e.g., shrink wrap) to accomplish this is to be determined.

**Foundation Element 3: Some form of agreement will be needed between the address authorities who produce the data and the organization(s) that is responsible for overseeing the distribution mechanism** to ensure that the distributing agent authorized (has sufficient legal foundation) to withhold access from non-qualifying interests. Strive for a simple, automated process to distinguish between authorized and unauthorized users to ensure minimal support overhead.

**Foundation Element 4: Don’t use the term “license”, as it is a loaded term with a range of meanings.** Use the term “available with these restrictions”

---

<sup>4</sup> Open access distribution. Address authorities contribute data that is freely available to anyone who agrees online to a liability disclaimer.

<sup>5</sup> Limited access distribution (like parcel data). MetroGIS creates a terms and conditions document patterned after the parcel data agreement that allows MetroGIS to distribute the data only to licensed government and academic entities. MetroGIS would not expect all address authorities to participate. Data contributed under the terms and conditions would be available via a password protected FTP site and possibly a secure web service.

**In addition to providing direction for desired access/ distribution policy,** the Board also directed the Committee to:

“...propose an outreach plan that builds upon Chairperson Schneider’s and Member Elkins’ willingness to advocate among city leadership for the proposed Regional Address Points Dataset and related access/distribution policy proposed and endorsed by MetroGIS.”

In so doing, the Board also acknowledged three key organizations (League of Cities, Metro Cities, and LOGIS) that will need to endorse the proposed policy if contributions to the Regional Address Points Dataset are to become widespread. Chairperson Schneider and Member Elkins, as the city representatives to the Policy Board, also agreed to advocate among the leadership of these organizations for the proposed Regional Address Points Dataset and acceptance of access/distribution policy proposed and endorsed by MetroGIS.

The Board also concurred that once the desired policy components are well articulated and agreed upon they should be shared that with Mn Information Policy Office (IPO) officials for comment.

## 2) **Coordinating Committee:**

December 17, 2009: Staff reported to the Committee that in response to an invitation from Policy Board Chair Schneider, Mayor of Minnetonka, and Ben Verbick, GIS Manager for LOGIS, Mn League of Cities officials had agreed to lead development of the subject disclaimer language. As of this writing, a time frame is not yet known.

It was also reported that the Metropolitan Council management had authorized the Council’s GIS Unit to serve in the capacity of regional custodian and that the Address Workgroup would be offering an interim policy statement for Committee acceptance at the March meeting.

September 10, 2009: The Coordinating Committee tabled consideration of a draft Regional Policy Statement for the Regional Address Points Dataset, dated August 18, to investigate whether the Mn League of Cities could lend a hand with the standard liability disclaimer language.

March 26, 2009 the Committee provided feedback (see complete Attachment F for more information), on a data access policy concept suggested by the Address Workgroup and authorized the concept to be shared with the Policy Board for further direction (occurred July 22, 2009), subject to compliance with the following conditions:

- a) Explore existing statute. What rules currently exist that pertain to access to address point data and does any entity(ies) currently have a salutatory mandate to collect address point data.

*Status: Response to inquiry to Mn Governor’s Council on Geographic Information – no knowledge of existing laws specific to address data. No response to an inquiry to the Mn Office of Information Policy to assist in this investigation.)*

- b) Present the topics to the Board as issues and opportunities, not as recommendations at this juncture.

*Status: In preparation for consideration by the July Policy Board meeting, the Staff Coordinator and Mark Kotz, Chair of the Address Workgroup, met on June 3 with Policy Board Chair Schneider and Member Elkins, the city representatives to the Policy Board. The purposes of this meeting were to: 1) share concept data access policy for the pending Regional Address Points Dataset suggested by the Coordinating Committee for refinement prior to sharing it with the full Policy Board, 2) seek advice concerning presenting the concept to the Board and 3) seek buy-in to advocate for agreement on a workable policy among address authorities (generally cities). A concept policy framework was agreed upon which they agreed to take the lead on to share with the Board at the July meeting for additional comment. A concept outreach strategy was also agreed upon through which to obtain widespread buy-in among cities, again to share with the Board for comment at the July meeting.*

- c) Explain how the proposed web application will work with existing address creation operations. Share an expectation for how will the initial dataset will be populated.

Status:: Accomplished in the July 22, 2009 presentation to the Policy Board- Item 5d at [http://www.metrogis.org/teams/pb/meetings/09\\_0722/09\\_0722m\\_V3%20draft.pdf](http://www.metrogis.org/teams/pb/meetings/09_0722/09_0722m_V3%20draft.pdf) )

- d) Arrange for local address authorities to participate in the presentation and state why they believe the proposed regional solution will be value to them.

Status: Ben Verbick, LOGIS, and Joel Koepp, City of Roseville, participated in the July presentation to the Policy Board.

#### **STATUS OF PREREQUISITE PROJECTS (MARCH 3, 2010)**

- Needs Assessment: A Needs Assessment was completed in June 2007, which demonstrated that Address Authorities are interested in contributing data to the proposed regional dataset. The final report can be viewed at [http://www.metrogis.org/data/info\\_needs/street\\_addresses/web\\_editing\\_%20app\\_viability\\_assessment\\_final.pdf](http://www.metrogis.org/data/info_needs/street_addresses/web_editing_%20app_viability_assessment_final.pdf).
- Data Synchronization Mechanism: Development of this was successfully completed in December 2008. This project was managed by Carver County and funded by MetroGIS.
- Address Point Editing Tool: At the time of this writing (March 2010), contract negotiations were in progress to retain Applied Geographics to create a prototype web-based address points editing tool for a fee of \$13,500. This tool is expected to be available by July 2010. Once the prototype is developed, outreach efforts are anticipated to begin to secure use of the application by local address authorities. The Metropolitan Council will serve as the contracting authority. The current expectation is that the tool could be available as early as July 2010. (scope of work available upon request.)

# ATTACHMENT F

## EXCERPT

### MARCH 26, 2009 COORDINATING COMMITTEE MEETING SUMMARY

#### 5b) Regional Address Point Dataset – Access Policy Preferences

Mark Kotz, Chairperson of the Technical Leadership Workgroup, began his presentation with a summary of the work to date to evolve the schema for a regional address points dataset. He then commented that it is now time to agree on the **rules for access** to this proposed database before actually creating it and offered a recommendation from the Address Workgroup that suggested **two options** be made available to the producers/owners of the address point data - open access and licensing similar to the policies currently in place for parcel data.

1. License distribute (like parcel data). MetroGIS creates a license agreement patterned after the parcel data agreement that allows MetroGIS to distribute the data only to licensed government and academic users. MetroGIS would **not** attempt to get all address authorities to agree to the language of the license agreement and would **not** expect all address authorities to participate. Data contributed under this license would be available via a password protected FTP site and possibly a secure web service.
2. Open distribution. Address authorities contribute data that is freely available to anyone who agrees online to a liability disclaimer (exact method to be determined).

Additionally, the Address Workgroup's recommendation was that MetroGIS may wish to consider a method of charging for the protected (limited access) data and providing a portion of all sales to all participant organizations in a manner proportional to the amount of data they contribute. The idea to sell data is not a consensus view of the Address Workgroup, but many view it as a good idea. The workgroup wishes to stress that it is very important to approach the potential selling of data separately from the proposal of the two scenarios above, or that effort will be significantly delayed.

(Kotz's presentation slides can be viewed at

[http://www.metrogis.org/teams/cc/meetings/09\\_0326/5b\\_Distribution%20Policy%20Recommendation.ppt](http://www.metrogis.org/teams/cc/meetings/09_0326/5b_Distribution%20Policy%20Recommendation.ppt)  
.)

The group **concurred with the proposed one-size-will-not-fit-all approach**. ... a wide ranging discussion ensued that touched on data ownership, authoritative source, trusted stewards, intellectual property rights, need to investigate current statute to determine if statutory authority currently applies to this data type. Several of the specific comments were as follows:

Gelbmann expressed **concern about modeling** the licensure option proposal **after the paper-based licensing protocol** currently in place for parcel data. Brown stated that Hennepin County is in the midst

of developing a "check the box" online liability waiver process that is expected to greatly expedite the current licensing process. Read emphasized that cities want the **ability to review address data produced** by adjoining cities to ensure consistency, so at a minimum the default address point data license needs to be something like that used for parcel data whereby government organizations are able to have access to **the entire geographic extent of the region**. The question the workgroup focused on was how to make it possible for those cities who want to offer access beyond the minimum protocol, hence the proposed option to formally allow for open access in a standardized manner....

Chinander cautioned that **not all emergency responders are government entities** and encouraged the modification of the draft policy to ensure access by all entities engaged in emergency response activities. Wencl concurred that effectively addressing emergency response needs should be priority for the proposed access policy, noting that federal agencies are looking for address-based data, not parcel data. Claypool added that as the National Grid is more widely used, the importance of address-based data also increases.

Slusarczyk asked how compliance with standards, specifically **data completeness and currency**, would be policed. Kotz commented that the reason for seeking active participation by address authorities to serve as the official source is that they have a business need for these data and, as such, compliance is not expected to be a problem. Several county members of Committee, who currently oversee similar operations, concurred. In response to the proposal that County involvement be optional, Slusarczyk added that he would **prefer that the counties have a role to oversee quality control**. Arbeit concurred that he believes that involving the counties in a quality control oversight role/some form of filter even if no formal authority is involved to require change, will be important to ensure consistency, in particular, if this model catalyzes interest beyond the metro area.

In response to a question from Chairperson Wakefield, a short discussion ensued during which county representatives shared that if the local address authorities were to participate, as proposed, their **county operations would benefit** by having to do less work to aggregate address data they are currently receiving from cities.

**The members concurred that before the workgroup's recommendation is shared with the Policy Board for comment, the following actions should be accomplished (*Status – Reference Section*):**

1. Explore existing statute. What rules currently exist that pertain to access to address point data and does any entity(ies) currently have a salutatory mandate to collect address point data. Present the topics to the Board as issues and opportunities, not as recommendations at this juncture
2. Present the topics to the Board as issues and opportunities, not as recommendations at this juncture.
3. Explain how the proposed web application will work with existing address creation operations. Share an expectation for how will the initial dataset will be populated
4. Arrange for local address authorities to participate in the presentation and state why they believe the proposed regional solution will be value to them



**TO:** Policy Board  
**FROM:** MetroGIS Staff Coordinator  
Contact: Randall Johnson (651-602-1638)  
**SUBJECT:** MetroGIS Community's 2010 NSDI CAP Grant-Funded Project  
**DATE:** April 8, 2010  
(For April 21<sup>st</sup> Meeting)

## INTRODUCTION

The purpose of this report is to update the Policy Board on the status of the return on investment study for which the MetroGIS community has been awarded a \$50,000 federal grant to conduct. The project is entitled **Measuring Public Value of Geospatial Commons: A MetroGIS Case**.

When this agenda report was written, staff was unsure if a qualified consultant would be willing to work with us. A decision should be made by the time the Policy Board meets on April 21.

If a qualified contractor is willing to work with us, staff would take this opportunity to summarize the main objectives sought via this project and immediate next steps. A more complete briefing would be provided at the July 21 Board meeting.

The contingency of the project not moving forward is dealt with Agenda Item 5c.

## PROJECT PURPOSE

The focus of this grant-funded project is development of a "Quantify Public Value" methodology. Through the process of developing this methodology, we believe that we will simultaneously make progress on next-generation performance measures called for in the MetroGIS's new Performance Measurement Plan adopted by the Policy Board last October. Prior to receiving this grant award, \$15,000 had been allocated in MetroGIS's 2010 budget to develop these next generation measures.

## PROGRESS AS OF THIS WRITING

Notice that funding had been awarded for this project was received on March 15. The funding authority is the Federal Geographic Data Committee (FGDC) through its National Spatial Data Infrastructure (NSDI) Cooperative Agreements Program (CAP) program. The project involves hiring of a consultant. The Request for Proposals was published on March 29. The deadline for submittal of proposals is Friday, April 16. Review of the proposals is scheduled for the morning of April 20. Responses to questions were posted on April 7. If the project proceeds (a qualified contractor is hired), required training for the each of the ROI grant recipients is scheduled for May 5-6 in Raleigh, North Carolina.

## RECOMMENDATION

No action is requested.

## **EXCERPT FROM 3/31 PRESS RELEASE**

MetroGIS, the regional geospatial data infrastructure serving the seven-county, Minneapolis-St. Paul metropolitan area, announces a new project. The Quantify Public Value project, supported by an US Federal Geographic Data Committee Cooperative Agreements Program (FGDC-CAP) award, involves conducting a Return-on-Investment (ROI) study and the development of a new methodology to study the public value of shared geographic information. The 300 local and regional organizations that serve the seven-county, Minneapolis-St. Paul metropolitan area - the MetroGIS community - comprise the project domain. The territorial focus of the project is Hennepin County, a study sponsor, and the 32nd largest county in the United States by population. The new Quantify Public Value (QPV) methodology extends the ROI methodology developed by the Geospatial Information & Technology Association (GITA) to account for multiple uses and reuse chains. Understanding the public value of data sharing is a key issue in discussions surrounding SDI development and continued support. QPV takes into account value chains and reuse benefits over a longer term perspective. The project involves the participation of government, industry, and academic groups. During the project the draft QPV method will be presented to experts in the SDI domain for refinement and discussion.

In the QPV project, the selected contractor will conduct an ROI case study and create a replicable methodology capable of quantifying value (direct and indirect) to both the taxpayer and participating government organizations, in particular, parcel data that adheres to standards that support interoperability. The release of a request for proposals (RfP) to conduct a Return-on-Investment (ROI) study and participate in other phases of the project has just been announced. Deadlines are 4/6/2010 (for questions) and 4/8/2010 (for proposal submissions).

MetroGIS is a nationally renowned organization. In 2002 it received the URISA Exemplary Systems in Government (ESIG) Award. The MetroGIS vision for the result of MetroGIS's its efforts, is "organizations serving the Twin Cities Metropolitan Area are successfully collaborating to use geographic information technology to solve real world problems". The coordinating role of MetroGIS is explained in the Mission Statement: - MetroGIS exists "to expand stakeholders' capacity to address shared geographic information technology needs and maximize investments in existing resources through widespread collaboration of organizations that serve the Twin Cities metropolitan area".

### Contact Information:

For Project Administrative Matters: Randall Johnson, Metropolitan Council,  
[randy.johnson@metc.state.mn.us](mailto:randy.johnson@metc.state.mn.us)

For Project Research Matters: Francis Harvey, University of Minnesota,  
[francis.harvey@gmail.com](mailto:francis.harvey@gmail.com)



**TO:** Policy Board

**FROM:** Coordinating Committee  
Chairperson: Sally Wakefield, 1000 Friends of Mn  
Staff Contact: Randall Johnson (651-602-1638)

**SUBJECT:** 2010 Work Plan and Related Budget Refinements

**DATE:** April 6, 2010  
(For Apr 21<sup>st</sup> Meeting)

## INTRODUCTION

Guidance is requested from the Policy Board regarding high-level outcomes desired for reuse of funds currently allocated to projects that have an uncertain fate or for which their importance has diminished relative to other opportunities that have recently become known. Acceptance of specific projects to accomplish these outcomes will occur at a later date.

The purpose of this report is to bring these concerns to the Board's attention now to ensure prudent use is made of limited resources. Approximately \$29,000 in funding is involved. Desired project refinements should be agreed upon soon to ensure the new project(s) can be completed by year-end. The Board's preferences will guide the Committee's deliberations to define new uses for these resources and refine relative priorities for allocation of support resources.

## SITUATION

- 1) Geo Applications Creative Innovations Competition Project. Required partner funding has not materialized. A total of \$18,500 was allocated in the 2010 MetroGIS budget for this project toward an estimated \$65,000 project budget (see the Reference Section for more information).
- 2) NSDI grant-funded project "Measuring Public Value of Geospatial Commons: A MetroGIS Case". By the time that the Policy Board meets on April 21, we should also know if a consultant is willing to work with us on this project. The deadline for consultant proposals is Friday, April 16. In January, when the 2010 work plan was adopted, work on the Phase II Performance Measurement (PM) Update Project was postponed until the results from the subject grant-funded project were known. Development of the proposed quantitative model is expected to have implications for development of the subject performance metrics. If the grant-funded project does not proceed, the 2010 work plan should be refined to reinstate Phase II PM project as a 2010 project. (See Attachment A and Agenda Item 6a for more information about both projects.)
- 3) Supplemental Professional Services Contract. The approved 2010 work plan and budget called for a professional services contractor to be retained to take the lead on various communication and outreach related projects (see Attachment A, Items 1, 6, 9, and 16). Procurement issues and support requirements for higher priority projects have precluded staff's ability to pursue this supplemental support. \$12,000 is allocated for this purpose. Along with consideration of the programming refinements outline above, the relative value of these services should be investigated relative to the value of to be defined new projects suggested below that address specific stakeholder business needs.

## GOALS - CREATIVE INNOVATIONS COMPETITION PROPOSAL

To recognize the significant effort that has been made by many to prepare for the competition, it is suggested that the freed up funds be reallocated to support a project(s) that works toward the same four outcomes that the competition was designed to work toward. As such, several candidate projects to which to allocate these funds are offered below along with statement of the goal(s) they align with.

Four principal goals are listed below that underpin MetroGIS's decision to host of the subject competition. The sources of these goals are the 2008-2011 MetroGIS Business Plan (*organizational*

goals – OG) and a workshop hosted by MetroGIS in November 2008 to define shared service needs (project goals – PG) [order of listing is not intended to imply relative importance]:

- Catalyze Partnerships with Public-Private / Non-Traditional Users (OG): By catalyzing application development, organizational partnerships, which are important to addressing shared information needs, might also be identified. MetroGIS leadership has defined a goal of catalyzing partnerships that involve multiple sectors and non-traditional users to address shared information. It was hoped that the proposed competition could accomplish the identification of opportunities to act on this goal.
- Demonstrate the Value of Web Services/Applications to Policy Makers (OG): Assist decision makers better understand the value to their business operations that can be realized using web services and / or applications supported by web services when standardized across multiple jurisdictions.
- Expand Publishing of Web Services (PG): An incentive is needed to encourage data owners to publish their data as web services. The thought is that making their services available would lead to development of applications that would be recognized by the data owners as a low risk-high reward means to explore the potential of creating value important to them via publishing services.
- Implement Geospatial Commons (PG): The competition was expected to expedite in-progress work to stand up the infrastructure needed to centralize publishing and finding web services. This proposed infrastructure is now called the Geospatial Commons. MnGeo and MetroGIS were collaborating on this need before the competition idea was conceived. Significant progress has been made towards this end. Regardless of the fate of the competition, this important work should continue to be supported and will facilitate the sharing of data and web services long term.

**CANDIDATE ALTERNATIVE USES FOR THE COMPETITION FUNDS**

The MnGeo/MetroGIS Geospatial Commons Workgroup met on April 8. Its input is captured in the following table, along with ideas offered by the Staff Coordinator. Each relates to the four previously defined goals identified above:

<b>Candidate New Project</b> <i>(See Reference Section for more information)</i>	<b>Catalyze Public-Private Partnerships</b>	<b>Expand Publishing of Web Services</b>	<b>Demonstrate Value/Expanded Resources)</b>	<b>Implement Geospatial Commons</b>
1. Provide assistance to data owners to publish their data as web services	?	X	?	?
2. Create a template methodology for documenting and publishing web services via the Commons	?	X		X
3. Provide funding for projects that create applications/web services that apply to specific business needs. For example: a) Testbed for Place-Based Budgeting Web Application <sup>(1)</sup> b) Testbed to move Emergency Preparedness Structures Web Application from prototype to operations <sup>(2)</sup>	X	X X	X X	
4) Investigate collaborating with GITA to host a GECCo Forum in the Twin Cities <sup>(3)</sup>	X		?	?
5) Test implementation of the MN Geospatial Commons <sup>(4)</sup>	?	X		X

**RECOMMENDATION**

That the Policy Board:

- 1) Confirm that any new project that is funded with funds that were allocated to the Geo Applications Creative Innovations Competition should align with one or more of the four above-stated goals.
- 2) Request Chairperson Schneider to work with Coordinating Committee leadership to define new uses for approximately \$29,000 in funding and revise the 2010 MetroGIS work plan and budget, accordingly (Attachments A and B) .
- 3) Request staff to report the revised MetroGIS work plan and budget back to the Policy Board via email.

## REFERENCE SECTION

### ***Alternative Uses for MetroGIS Project Funds***

The following information supplements the project names listed in the table under the Candidate Alternative Uses for the Competition Funds section in the main body of the report

- 1) Place-based Budgeting Web Application: The idea that the MetroGIS community be considered as a testbed option was conceived by the Staff Coordinator during a NGAC discussion on March 25. This idea was shared with Hennepin County Commissioner Johnson at the NGAC meeting before offering the Twin Cities as candidate testbed location. At the March 31 meeting of the MGAC, staff learned of a similar interest of David Arbeit, state GIO. This type of application functionality has resonated well among policy makers that it has been shared with and acts on a current administration priority.
- 2) Emergency Preparedness Structures Web Application: The Emergency Management Preparedness Workgroup oversaw the prototyping via a federal grant of a web-based application that utilizes “crowd sourcing” and web services to populate the locations of and various descriptors (attributes) for hospitals, fire stations, medical clinics, and schools. This proposal would seek to move from prototype to operational application for the Twin Cities.
- 3) Geospatially Enabling Community Collaboration (GECCo) initiative of GITA (Geographic Information and Technology Association). The Staff Coordinator learned of this initiative (see Attachment D) while attending the March NGAC meeting. It appears to be well aligned with MetroGIS’s goal to catalyze public-private partnerships. As of this writing, conversations were in progress with GITA leadership to learn more about how MetroGIS might leverage this initiative.
- 4) Test implementation of the MN Geospatial Commons: The MnGeo/MetroGIS “Commons” Workgroup has the CIO’s of 3 large agencies and the state GIO signed on to this project. One risk is that draft project plan relies on a large amount of volunteer labor for the implementation team. Some seed money to jump start the installation and configuring of the ESRI software by a consultant could go a **long** way to fast tracking this project and getting something real implemented by GIS/LIS conference this fall. The state broker/portal/commons idea has been a standing priority of MetroGIS (see Activities 12 and 13 in the work plan in Attachment A) and the GCGI (now MnGeo). If timing is indeed “everything”, knowing that this project has a committed workgroup, project manager and executive sponsors gives it a very high chance of success. The Commons workgroup will discuss this idea at its monthly meeting. Following the meeting, more detail will be possible as to what specifically would provide the most bang for the buck related to the MN Geospatial Commons test implementation.

### ***Geo Applications Creative Innovation Competition***

#### **Preliminary Cost Estimate:**

The preliminary estimate for hosting the competition was estimated to be \$65,000, excluding awards, based upon the specifications outlined in the Project Charter:

• <u>Technical Project Manager</u>	\$24,000
• <u>Contest Administrator</u> – (cost for Wash D.C. Apps for Democracy)	\$30,000
• <u>Assistance with development of Metadata for Mapping Services</u>	\$10,000
• <u>Misc Support (travel, supplies, advertisement, etc)</u>	<u>\$1,000</u>
• <u>Awards/Prizes</u> (assume provided by sponsors? E.g., \$1,000 per award?)	\$ 0 ( <i>Partners</i> )
	<b>\$65,000</b>

#### **Need for Dedicated Technical Project Manager and General Project Support:**

The Competition Workgroup concluded in mid-January 2010 that the only realistic means to provide adequate support and successfully host the proposed competition would be to hire a consultant to serve in this capacity. This decision to seek consultant assistance was heavily influenced in that no responses were received to the support interest survey conducted on January 4.

Subsequently, a Project Charter and Solicitation for Statements of Interest to serve as Technical Project Manager were created (see Exhibit 1, Attachment C). The solicitation was published on March 1. Four responses were received by the noon March 18 deadline. The Coordinating Committee met at 1 p.m. on March 18 and was informed that four proposals had been submitted. The Committee directed staff to determine if at least one of the proposals was from a qualified proposer and, if so, to follow up with state agencies to confirm their intentions as to whether or not they were planning to contribute funding. A message was sent to several state agencies on Friday, March 19. Several state representatives responded, each expressing interest in the concept but also noting that funding was not available at this time. As of this writing, no all of the interests contacted had responded. The Committee was apprised that the required partner resources had not materialized and that timing was becoming a concern. In response, a discussion ensued about how the project plan might be modified to continue to make progress toward the major objectives. An except of the Committee's discussion and direction follows:

....Mark Kotz, representing the workgroup that developed the project charter, commented that the workgroup believes that the contest is needed to provide an incentive to data producers to stand up their services... Most Committee members concurred that the presence of a Technical Project Manager would expedite the standing up of web services but there was not unanimous agreement that if a deliverable, short of hosting the contest, is agreed to, that the revised project would be worth investment of MetroGIS's funds. Others believe that a chicken and an egg situation exists in that a full scoping of the project and possible implementation options that would affect the cost (e.g., the current proposal to retain a contest manager may not be needed) is too large of a task for a volunteer. The role of the proposed Technical Project Manager in the standing up of services was also questioned; some believing the role would be high level oversight and other commenting that the role would be more hands on.....

...Kotz... concluded by stating that if partners do not commit the needed additional funds that MetroGIS should investigate, soon, what we can do with the funds that are available, whether contest related or not. The Staff Coordinator commented that a decision to use the funds in another way should be made before the June meeting to have any chance of capturing them...

...The group deferred a decision on the option of a project that results in deliverables short of hosting a contest (standing up more services, advertisement of these services so they are used more, building of relationships and education of the value of services, etc.) until the supplemental funding question is resolved..

**Motion:** Member Bitner moved and Member Read seconded to:

- 1) Accept Member Bitner and Member Gelbmann's offer to head up a team to review the four statements of interest that were submitted regarding serving as the Technical Project Manager.
- 2) Accept Mark Kotz's offer to speak with state agencies about their willingness to partner with MetroGIS and contribute funding to this project.
- 3) Direct the Staff Coordinator to communicate the results of actions 1 and 2 with the Committee as soon as possible along with recommendations for next steps.

Motion carried ayes all.

**ATTACHMENT A**

**Foundation Document  
2010 MetroGIS Work Plan Refinements  
(Spring 2010)**

*(See Following Page)*

## MetroGIS 2010 Program Objectives

### (Suggested Modifications for Coordinating Committee Consideration Per Board Direction April 21, 2010)

(\*\*Indicates an activity that is at least in part dependent upon securing additional technical leadership and coordination resources).

Proposed Objective (Numbers intended to designate relative importance)	Proposed Priority	Comments	Lead Responsibility
1. Sustain traditional "foster collaboration" support activities <sup>(a)</sup> . (see Item 5)	<b>Very High</b>	<u>Ongoing.</u> Directive set forth in the 2008-2011 Business Plan. <del>Consider Need to viability of secure securing planned Supplemental</del> Professional Services Contractor <u>to supplement support provided by the Staff Coordinator, in particular</u> to increase time available to expand outreach effort called for in July 2009. <del>RFP process expected to be published fall 2009.</del>	Designated Custodians and Staff Coordinator
2. Continue to seek addition of dedicated Technical Coordinator and technical administrative resources to the MetroGIS support team.	<b>Very High</b>	<u>Carry over from 2009.</u> Changed tactic to <u>retaining the services of a project/technical coordinator on a project by project basis investigating potential for 3-5 year outsource contract funded by multiple beneficiaries, as opposed to a permanent new position.</u> <del>Until these dedicated resources are secured, the</del> The Technical Leadership Workgroup will continue to fill this role to the extent possible <u>when a technical coordinator not available.</u> <b>Objectives proceeded with "***" can not be fully achieved without these additional resources.</b>	Staff Coordinator with advice from Technical Leadership Workgroup -- Mark Kotz, Chair
3. Execute the Next-Generation Street Centerline Data Access Agreement	<b>Very High</b>	The current agreement will expire 12/31/10. A RFP is anticipated to be published late <del>winter</del> spring.	Staff Coordinator
4. **Implement a Regional Address Points Dataset and Web-Editing Application to assist smaller producers of address data participate in the regional solution.	<b>Very High</b>	<u>Carry over from 2009.</u> Applied Geographics has been selected to develop this application. <del>Need to execute a contract before work on the actual database can begin.</del> <u>Application development anticipated to begin late spring 2010.</u> Once this application is developed, work on the actual regional dataset <del>can</del> <u>planned to begin.</u>	Address Workgroup - Mark Kotz/Nancy Read Co-project mangers.
5. **Pursue implementation of solutions to specific shared needs for applications and web services specifically via: a) Implementation of Best Image Service (2009 funded project) b) Government Service Finder Prototype (2009 funded project) c) <del>Host a Web Feature Services contest modeled after the Apps for Democracy contest hosted by Washington D.C.</del>	<b>Very High</b> <b>Very High</b> <b>Very High</b>	<u>Ongoing.</u> Although a component of ongoing support, this generic objective is called out as a separate activity to call attention to the 3 specific projects, which involve MetroGIS funding— <del>2 approved and 1 proposed.</del>	Each of the three project workgroups that proposed these projects with advice from the Technical Leadership Workgroup - Mark Kotz, Chair.
Part of 5c. **Populate metadata for GeoServices Finder, including creation of a template to promote standardization	<b>Very High</b>	<u>Carry over from 2009.</u> <u>Component of Item 12.</u>	

<p align="center"><b>Proposed Objective</b> (Numbers intended to designate relative importance)</p>	<p align="center"><b>Proposed Priority</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Lead Responsibility</b></p>
<p>6. Expand effort related to “fostering awareness of MetroGIS’s accomplishments and the public value created via its efforts”, specifically to broaden basic understanding among non-traditional stakeholders and deepen understanding of leadership for key stakeholder interests.</p> <p><u>(Component of 2010 NSDI CAP grant awarded in March. Decision the week of April 19 if a consultant willing to work with us.)</u></p>	<p align="center"><b>Very High</b></p>	<p>These efforts should be coordinated with the development and implementation with the surveys proposed for the next-generation Performance Measures Plan expected to be endorsed October 2009.</p> <p>This expanded outreach initiative should also be designed to address the intent of the action “Evaluate stakeholder participation relative to needs to achieve current regional objectives” called for in Item “f”, Section VIII of the Business Plan”</p>	<p>Staff Coordinator in conjunction with supplemental professional services to assist with defining the methods and materials.</p>
<p>7. Develop specific performance measure methods (measures of public value) to implement 2009 Performance Measurement Plan</p> <p><u>(Component of 2010 NSDI CAP grant awarded in March. Decision the week of April 19 if a consultant willing to work with us.)</u></p>	<p align="center"><b>Very High</b></p>	<p>Second phrase of the Performance Measurement Plan update process accomplished in 2009. The first phase was designated as a Very High priority. The Updated Plan calls for annual assessments of stakeholder satisfaction with MetroGIS’s efforts via surveys.</p> <p>Coordinate performance measurement survey design with development of research method for second generation shared information needs evaluation (Item 8)</p>	<p>Staff Coordinator in conjunction with supplemental professional services</p>
<p>8. **Conduct second-generation identification of shared information needs. Phase I Only– Define research method.</p> <p><u>(Component of 2010 NSDI CAP grant awarded in March. Decision the week of April 19 if a consultant willing to work with us.)</u></p>	<p align="center"><b>Very High</b></p>	<p><u>Key component to catalyzing cross-sector partnerships.</u> Identified in the Business Plan as a 2009 objective to be conducted in conjunction with shared application needs assessment but not previously included in an annual work plan (Item “d”. Section I of the Business Plan” (Attachment C of this report).</p> <p>In November 2008, a forum was hosted to identify shared application and service needs. The information gained only partially addresses the larger scope intended by this objective.</p> <p>The emphasis on actions to understand and act on emerging needs proposed in the new Performance Measurement Plan complements this objective, as is the call to continually assess user satisfaction via surveys and peer review forums.</p>	<p>Staff Coordinator with advice from the TLW</p>
<p>9. Initiate updating of the MetroGIS Outreach Plan to emphasize ways to identify opportunities and ensure stakeholder awareness of regional datasets, DataFinder, pending solutions related to shared application needs</p>	<p align="center"><b>Very High</b></p>	<p><u>Carry over from 2009.</u> Related to Objective 3, a priority need identified by the new Policy Board Chair spring 2009. Dependent upon securing the planned Supplemental Professional Services Contractor</p>	<p>Staff Coordinator in conjunction with supplemental professional services</p>
<p>10. Streamline Data Access for Emergency Responders <u>(Method: Explore partnering with GITA’s GEOCo Initiative to accomplish this outcome.</u></p>	<p align="center"><b>Very High</b></p>	<p><u>Carry over from 2009. Component of defining cross-sector partnerships. A workgroup made progress in 2009 to define the issues but was</u></p>	<p><u>Workgroup, Gordon Chinander, Chair</u></p>

<b>Proposed Objective</b> (Numbers intended to designate relative importance)	<b>Proposed Priority</b>	<b>Comments</b>	<b>Lead Responsibility</b>
		<del>unsuccessful in developing a strategy to address the need.</del>	
11. Investigate organizational/governance structure changes necessary to effectively address priority shared geospatial needs	<b>Very High</b>	<u>Carry over from 2009.</u> A related initiative to explore partnering opportunities with non-government interests. The idea was explored with several local content experts who possess desired expertise. Although interest was expressed, no substantive progress was made. As this topic is also a high priority of the National Geospatial Advisory Committee, in particular its Governance Subcommittee, the Staff Coordinator elected to integrate MetroGIS's experience and needs into a <a href="#">white paper</a> developed by the Governance Subcommittee and endorsed by the full National Geospatial Advisory Committee (NGAC) on 12/2/09.	Staff Coordinator
12. ** Pursue implementation of a more fully developed geographic data, applications and service broker	<b>Very High</b>	<u>2009 objective postponed to 2010</u> per Policy Board decision on July 22, 2009. <a href="#">A component of catalyzing cross sector partnerships.</a>	Technical Leadership Workgroup - Mark Kotz, Chair
13. ** Explore methods for Enhancing Trust in reliability of shared services.	<b>Very High</b>	<u>2009 objective postponed to 2010</u> per Policy Board decision on July 22, 2009. <a href="#">A requirement to accomplish Item 13.</a>	Technical Leadership Workgroup - Mark Kotz, Chair
<b><i>STRETCH OBJECTIVES TIME AND RESOURCES PERMITTING</i></b>			
14. Building upon the key elements defined for a Leadership Development Plan in 2008, agree on specific strategies to achieve each of the outcomes called for via in the approved key elements.	<b>High</b>	<u>Carry over from 2009.</u> Development of strategies to attain the deliverables called for in the key elements defined fall 2008. Dependent upon securing the planned Supplemental Professional Services Contractor.	Staff Coordinator in conjunction with supplemental professional services
15. ** Establish and leverage working relationships with jurisdictions adjoining the Twin Cities metropolitan area to improve data interoperability with those jurisdictions	<b>High</b>	<u>Carry over from 2009.</u> The presence of Supplemental Professional Services (see item 1) and a Technical Coordinator are needed to free up sufficient time to effectively address this objective	Staff Coordinator in conjunction with advice from Technical Leadership Workgroup
16. **Initiate and complete development of a plan to ensure obstacles to data sharing do not materialize (see January 24, 2008 workshop proceedings), including evaluation of the "organizational competencies" concept to identifying strategic capabilities not identified during development of the 2008-2011 Business Plan	<b>High</b>	<u>Carry over from 2009.</u> Dependent upon securing a qualified Supplemental Professional Services Contractor - see Priority No. 1. The original 2009 objective called for completing this plan. The Policy Board directed on July 22 that the survey of stakeholders called for in the next generation Performance Measurement Plan is to be incorporated into this activity.	Staff Coordinator in conjunction with supplemental professional services

Proposed Objective (Numbers intended to designate relative importance)	Proposed Priority	Comments	Lead Responsibility
<b><i>STRETCH OBJECTIVES TIME AND RESOURCES PERMITTING</i></b>			
17. **Develop support Plan for DataFinder, which incorporates tactics listed in the Business Plan (a component of the plan to ensure obstacles to sharing do not materialize – Item 16, above)	<b>Medium</b>	If DataFinder is proposed to remain a freestanding application, pursue the preliminarily cited 2009 objective to "Prepare a support Plan for DataFinder". Otherwise, consolidate with a plan for the replacement application	
18. **Make substantive progress to achieve vision for next generation (E911-compatible) Street Centerline Dataset	<b>Medium</b>	Postpone until Peer Review Forum hosted for current NCompass (TLG) Street Centerline Dataset	
19. Refresh design of MetroGIS website	<b>Medium</b>		
20. **Create a forum for visioning, coordinating, finding, and funding technical resources for the development and testing of applications and web services.	<b>Low</b>	Premature use of limited resources until work completed to identify priorities for shared application needs.	
21. **Explore Geospatial Marketplace – (Collaboration Registry/Portal)	<b>Low</b>	The TAT considered this idea at its April 17, 2008 meeting and did believe it to be a good use of resources, given other higher priorities at this time.	
22. Expand Outreach Plan to include a marketing component	<b>Low</b>	Policy Board directive July 2007 distinguishes marketing from outreach	
23. Investigate impact of cost recovery on ability to achieve desired data sharing	<b>Low</b>	Identified as a need in Appendix K to the 2008-2011 Business Plan	
24. **Conduct Peer Review Forums for endorsed regional solutions to shared information needs	<b>Low</b>	<p><u>Carry over from 2009.</u> Dependent upon availability of supplemental technical and administrative support. Should be coordinated with Item #8 and surveys associated with performance metrics.</p> <p><b><i>NOTE: The Chair of the Technical Leadership Team believes that Item 8, if conducted, will achieve the purpose of this objective. Therefore, it can be assigned a low priority until after the second generation needs are known.</i></b></p>	

(1) Traditional activities that comprise the MetroGIS “foster collaboration” function include:

- Identifying and defining shared geospatial information needs. Includes seeking out partnerships with non-government entities that share information needs with government entities that serve the Twin Cities metropolitan area
- Implementing and maintaining relevance of collaborative regional solutions to address shared information needs, including applications as well as a data (2009 addition)
- Fostering widespread access and sharing of geospatial data, principally via the [www.datafinder.org](http://www.datafinder.org) web site
- Facilitating sharing of knowledge relevant to the advancement of GIS technology among stakeholders (*ongoing*)
- Monitoring activities related to performance measures, reporting findings and adjusting policies as needed (*ongoing*)
- Ensuring decision-making processes are meaningful, productive, and a good use of participants' time (*ongoing*)
- Engaging policy-makers to provide a political reality check and to maintain political legitimacy (*ongoing*)
- Advocating for MetroGIS’s efforts in development of statewide geospatial policies (*ongoing*)
- Seeking opportunities to learn from efforts with similar objectives – statewide, national, and internationally (*ongoing*)
- Fostering awareness of MetroGIS’s accomplishments and the public value created via its efforts (*ongoing*)
- Documenting benefits associated with MetroGIS’s efforts via stakeholder testimonials (*ongoing, 1-2 per year*)

**ATTACHMENT B**

**Foundation Document  
2010 MetroGIS Budget Refinements  
(Spring 2010)**

*(See Following Page)*

**2010**  
**MetroGIS "Foster Collaboration" Function Budget**  
(Funding provided by the Metropolitan Council)

		2010	2010
Main Activity	Sub-Activity	Approved January	Refinements April
<b>Professional Services/Special Projects</b>		<b>\$55,500</b>	<b>\$28,500</b>
	<b>A. Identify and Implement Solutions to Specific Shared Information and Application Needs</b>		
	(1) Host Web Feature Services Contest (assumes other partners) - <i>Original Priority 5</i>	\$15,000	\$0
	(2) Populate Metadata for Geoservices Finder / Provide assistance to data owners to publish their data as services ( <i>in conjunction with A1</i> ) - <i>Original Priority 5</i>	\$3,500	\$3,500
	(3) Project Plan/Outreach Tactics/Develop Framework for Regional Address Points Dataset - <i>Original Priority 4</i>	\$10,000	\$10,000
	(4) Conduct Second -Generation Shared Information Needs Analysis / Ensure Stakeholder Needs are Understood - <i>Org Priority 8</i>	<i>Part of A(1)</i>	(Part of 2010 NSDI Grant) <i>TBD if no grant</i>
	<i>(5) Streamline Data Access For Emergency Responders (Partner with GITA GEOCo Initiative)</i>	N/A	<i>TBD?</i>
	<i>(6) Pursue Implementation of Geospatial Commons (service broker)</i>	N/A	<i>TBD?</i>
	<i>(7) Testbed for Place-Based Budgeting Web Application</i>	N/A	<i>TBD?</i>
	<i>(8) Testbed to move Emergency Preparedness Structures Web Application from prototype to operations</i>	N/A	<i>TBD?</i>
	<i>(9) Test implementation of the MN Geospatial Commons</i>	N/A	<i>TBD?</i>
	<b>B. Organizational Development and Communication Projects</b>		
	(1) Develop Performance Measurement Methods to Implement New Plan Adopted 2009 - <i>Original Priority 7</i>	\$15,000	\$15,000
	(2) Develop a Plan to Address Known Risks and Obstacles to Sharing (e.g., Security, Licensing, Budgets, etc.) <sup>(ii)</sup> <i>Org Priority 16</i>	\$7,000	\$0
	(3) Develop new Communications/Outreach Plan - <i>Original Priorities 6 &amp; 9</i>	\$3,000	\$0
	(4) Design New Outreach Materials (Assume Mostly Internet Based - See below for printing) <sup>(i)</sup> - <i>Original Priorities 6 &amp; 9</i>	\$2,000	TBD
	(5) Leadership Development Plan ( <i>based upon 10 key elements defined in 2008</i> )	(iv)	(iv)
	<b>C. Technical Coordinator Outsource Contract (assumes other partners 3+/- year pilot)-</b>	<b>TBD<sup>(ix)</sup></b>	<b>(ix)</b>
<b>Data Access/Sharing Agreements</b>	<b>Regional Parcel Data Sharing Agreement (contract payments to counties per 2009-2011 agreement)</b>	<b>\$28,000</b>	<b>\$28,000</b>
<b>Outreach</b>		<b>\$2,100</b>	<b>\$200</b>
	<b>Printing Outreach Materials (e.g., Information Brochure) Item B(4) must precede.</b> <sup>(vi)</sup>	\$500	\$0
	<b>Advocacy/Networking Mileage (200 m/mo x \$.48/mile = \$1,152)</b> <sup>(vii) (viii)</sup>	\$1,200	\$200
	<b>Annual Report/Informational Brochure (see above)</b>		
	• <i>Postage – 800 postcards (\$0.30=\$240) in addition to 1500+ via email</i>	\$300	\$0
	• <i>Minimal for other communications</i>	\$100	\$0
<b>Misc Office</b>		<b>\$400</b>	<b>\$250</b>
	<b>Website Domain registration (www.metrogis and www.datafinder - \$20/ea)</b>	\$40	\$40
	<b>Specialty Team/Forum Support Materials</b>	\$360	\$210
	<b>TOTAL NON-STAFF PROJECT FUNDS</b>	<b>\$86,000</b>	<b>\$56,950</b>
		<b>Uncommitted</b>	<b>\$29,050</b>
<b>NOTES:</b>			
	<sup>(i)</sup> Development/update of outreach materials to follow Outreach Plan Update project. See Item B(2).		
	<sup>(ii)</sup> This activity includes developing a Livelihood Scheme / Defining Organizational Competencies. See 2008-2011 MetroGIS Business Plan (Chapter 3 - Section VIII and Appendix H) for explanation of organizational competencies and Livelihood Scheme.		
	<sup>(iii)</sup> Request for bids conducted November 2008. No bids received, so project postponed.		
	<sup>(iv)</sup> TBD. If sufficient budgeted funds remain uncommitted as of the October Policy Board meeting and carry over of uncommitted funds to 2010 is permitted.		
	<sup>(v)</sup> If other sources of funding are determined to be potentially available, decide how much of MetroGIS's funds should be redirected.		
	<sup>(vi)</sup> Rely on Internet and on-demand printing for handouts		
	<sup>(vii)</sup> Travel by participants is paid by the participant's organization		
	<sup>(viii)</sup> Knowledge sharing opportunities constitute an important reason why individuals elect to participate in MetroGIS activities.		
	<sup>(ix)</sup> Seek to retain a Project Coordinator on a project by project basis		

# ATTACHMENT C



Published - March 1, 2010

## Solicitation Statement of Interest *Technical Project Leader – Geo Applications Contest*

**Introduction:** Several organizations that serve the Twin Cities and greater Minnesota and which understand the power of using geospatial technology in conjunction with the Internet propose to host a Geo Applications Contest modeled after the [Apps for Democracy](http://www.appsfordemocracy.org/) contest hosted by Washington D. C. (<http://www.appsfordemocracy.org/>) The key outcomes sought by hosting of this contest are as follows:

- Significantly increase the number of organizations that are publishing geospatial web services (includes published documentation for each new service)
- Engage the growing community of internet-related application developers that are outside the typical Minnesota GIS community.
- Spur the creation of new and innovative applications that are based on our services and are of value to our customers and stakeholders.
- Demonstrate public value that can be created through data sharing and use of web services technology.

To effectively accomplish these outcomes and move this idea from concept to reality, a qualified Technical Project Leader is needed. The purpose of this Statement of Interest solicitation is to determine if there are any individuals, with the desired expertise, who are willing to serve in this capacity as a paid contractor. The project particulars are explained in detail in Exhibit 1 and the desired roles and qualifications of the Technical Project Leader are outlined in Exhibit 2.

**Statements of Interest Requested:** Interested Individuals, possessing the requisite skills defined herein are encouraged to reply to this request for Statements of Interest. The successful proposer would be retained as a professional services consultant and would work under the general direction of the Geo Applications Project Team. The form of the professional services contract will be determined once the organizational affiliation of the desired contractor is identified. The funding authority for this contract is anticipated to be the Metropolitan Council via MetroGIS and at least one other public interest. The goal is to have the individual hired by April 30, 2010.

Proposals will be judged based upon:

- 1) Proposer Statement of Interest in serving as the Technical Project Leader for the proposed Geo Applications Contest
- 2) Proposer qualifications
- 3) Cost

Questions about this solicitation for Statements of Interest must be submitted by close of business Monday, **March 8**, 2010 to be eligible for response. Answers to any and all questions submitted will then be shared on Wednesday, **March 10**, 2010 with all interests who request, and all who have responded to this solicitation of interest. For proposals to qualify for consideration, they must be received by email by the noon, Thursday, **March 18**, 2010. Please submit questions and final proposals (need not exceed 2-3 pages) to Randall Johnson, MetroGIS Staff Coordinator, [randy.johnson@metc.state.mn.us](mailto:randy.johnson@metc.state.mn.us) – **subject line: Technical Project Manager -Geo Applications Contest.**

# EXHIBIT 1

## PROJECT CHARTER / BUSINESS CASE

<b>I. Audiences</b>			
<b>Prospective:</b>			
<ul style="list-style-type: none"> <li>• Technical Project Manager</li> <li>• Project Partners</li> <li>• Contest Award Sponsors</li> <li>• Volunteers for Variety of Task-Based Support Roles</li> </ul>			
<b>II. Project Identification</b>			
<u>1. PROJECT NAME:</u>	<b><u>Geo Applications Contest</u></b>		
<u>2. COMMITTED FUNDING/ SUPPORT PARTNERS:</u>	<b><u>MetroGIS, Metropolitan Council</u></b>		
<u>3. INITIATION DATE:</u>	<b><u>December 17, 2009 (Coordinating Committee Direction)</u></b>		
<b>4. Project Managers:</b>	<b>Name</b>	<b>Phone #</b>	<b>E-mail Address</b>
<u>TECHNICAL</u>	<b>TBD</b>		
<u>ADMINISTRATIVE</u>	<b>Randall Johnson</b>	<b>651-602-1638</b>	<a href="mailto:randy.johnson@metc.state.mn.us">randy.johnson@metc.state.mn.us</a>
<u>5. BUSINESS NEED OR OPPORTUNITY</u>			
<p>Use of geospatial web services has potential to drastically improve organizational efficiencies for both producers and users of geospatial data. A contest is proposed as a catalyst to promote creation, publishing and use of geospatial web services. Prizes would be offered for specified types of web application development as well as a general category covering all applications. Principal outcomes sought include:</p> <ul style="list-style-type: none"> <li>• Significantly increase the number of organizations that are publishing geospatial web services (includes metadata developed for each new service)</li> <li>• Engage the growing community of internet-related application developers that are outside the typical Minnesota GIS community.</li> <li>• Spur the creation of new and innovative applications that are based on our services and are of value to our customers and stakeholders.</li> <li>• Demonstrate public value that can be created through data sharing and use of web services technology.</li> </ul>			
<b>III. Project Definition</b>			
<u>1A. BUSINESS OBJECTIVES</u>			
<ul style="list-style-type: none"> <li>• Promote the creation, publishing and use of geospatial web services, for consumption by public agencies and others</li> <li>• Promote a centralized location for publishing information about geospatial services</li> <li>• Engage emerging and new application developers and the user community</li> <li>• Create public value with new applications available to government and citizens</li> <li>• Promote innovation and new uses of existing geospatial data</li> <li>• Promote and exemplify transparency and open government</li> <li>• Identify cross-sector partnering opportunities to address shared information needs (<b>MetroGIS outcome</b>)</li> <li>• Demonstrate that public value can be created when publicly-produced geospatial data are utilized in web applications developed by non-government interests (<b>MetroGIS outcome</b>)</li> </ul>			
<b>1b. Agency: Intentions, Values, or Services Impacted by this Project</b>			
<ul style="list-style-type: none"> <li>• Low risk way to evaluate new technology/applications using existing data</li> <li>• Identify new users of data and new ways to use existing data</li> <li>• Provide better support to internal and external users by using applications developed via the contest</li> </ul> <p>Defining shared application needs and catalyzing collaborative solutions to those needs, is MetroGIS's top priority for 2010. \$18,500 and a portion of the Staff Coordinator's time have been allocated to addressing this need.</p>			
<u>2. PROJECT VALUES</u>			

- Minnesota government agencies and other organizations have a significant opportunity to increase efficiency by sharing businesses data and processes through web services.
- Focus - geospatial web services
- Non-spatial services welcome, but not main focus.
- Geographic extent - Minnesota
- Increased public awareness of the govt./agency resources (especially datasets) - leading to more efficiencies and more members of the community taking advantage of those efforts

### 3. PROJECT SUPPORT/PARTICIPATION ROLES

#### **a) Project Managers:**

- Administrative Manager
  - MetroGIS Staff Coordinator – Estimate 1/8<sup>th</sup> to 1/4 FTE over 6+ months (125-260 hours)
  - Schedule meetings and coordinate resources
  - Manage budgets and contracts
- Technical Project Manager & Manager - Estimate 1/8<sup>th</sup> to 1/4 FTE over 6+ months (125-260 hours)
  - Lead the project
  - Develop project scope and work plan
  - Chair Steering/Advisory Team

#### **b) Task-Based Support Roles**

- Steering/Advisory Team (*Technical Project Manager to Chair*)
  - Provide oversight & guidance to project managers
  - Assist with ad-hoc project needs
  - Promote and educate
- Contest Administrator
  - A hired consultant/vendor
  - Organizing & conducting actual contest
  - Make final rules, accept submissions, oversee judging
- High Level Champions/Advocates
  - Multiple – state, regional, county, city, etc.
  - Advocate for contest at high level
  - Encourage involvement of peer organizations
  - Advocate for funding
- Bush Beaters
  - Contact, encourage & assist potential data providers
  - Help document data and put in service format
- Data Producers
  - Stand up services

#### **c) Participants – Develop awesome new apps**

### 4. FOCUS

#### **BREADTH**

Any business process that relies upon use of geospatial data can theoretically make use of geospatial web services. The breadth of applicability of the proposed contest is limited only by the application developers' imagination of how to utilize web mapping services and the extent to which the producer-organizations elect to convert their data to services and make them available to others.

#### **DEPTH**

The application must utilize at least one GIS map service containing spatial data that falls within the state of Minnesota.

#### **OTHER**

Sponsors of specific awards may have input on the type of application that can win that award.

### 5. CONTEXT

#### **DEFINITIONS**

Definitions are provided here in the MetroGIS Glossary for 2010.



## **ASSUMPTIONS**

- If more organizations were to publish their data via web services, significant improvements in organizational efficiencies would result. (Less duplication of effort and more leveraging of finite resources)
- Once web services are made available, the owners will recognize the value to themselves and others and continue to maintain them.
- The contest will be announced at the 2010 Mn GIS/LIS fall conference to engage producers to publish their data via web services in preparation for the contest and encourage application developers to begin to think about participating.
- Greatly expanded availability of data via web services, sufficient to provide the incentive to web application developers to participate in the proposed contest, will be available by early 2011 when the contest begins.
- Hosting a contest presents a low-cost, low risk way to catalyze innovation across all sectors regarding creation of web applications; some of which are expected to create public value important to the producers of the web services at no cost to them. This model was demonstrated to be effective in 2008 by Washington D.C with its Apps for America Contest.<sup>1</sup>
- The benefits of the proposed contest are compelling enough to attract:
  - A number of volunteers who are willing to serve in a variety of leadership roles
  - Several organizations that are willing to contribute funding for a qualified contest administrator and other staff roles that may not be able to be effectively supported by volunteers.
  - Several organizations that are willing to sponsor awards
  - Numerous application developers who are willing to participate.

---

<sup>1</sup> In 2008, in Washington DC, the Office of the Chief Technology Officer had the goal of making DC.gov's Data Catalog useful for the citizens, visitors, businesses and government agencies of Washington, DC. The solution created was "[Apps for Democracy](#)" – a contest that cost Washington, DC \$50,000 and returned 47 iPhone, Facebook and web applications with an estimated value in excess of \$2,600,000 to the city. The first program was so successful it was followed by Apps for America 2 that was hosted last summer (<http://sunlightlabs.com/contests/appsforamerica2/>).

## CONSTRAINTS / FREEDOMS

- A thorough project proposal must be developed by volunteers and volunteers must also solicit interest among candidates for serving in the critical role of Technical Project Manager. This process takes time, at the expense of losing valuable project momentum.
- The role of Technical Project Manager may be found to be too time-consuming to expect a volunteer to accept it. If this is the case, additional fund raising will be needed to retain a qualified individual. A thorough project proposal must be developed by volunteers and volunteers must also solicit interest among candidates to serve in this capacity. The workgroup strongly believes that a pure volunteer for managing the project is unrealistic.
- A firm/person qualified to administer the contest may not be able to be retained for the available funding.
- A Technical Project Manager needs to be secured before a detailed support plan and related budget can be finalized to give the Project Manager an opportunity to oversee and take ownership of these efforts. Potential sponsoring organizations will likely want to review the project budget before they authorize funding.
- Best practices for contest rules have been developed and tested by others which can be leveraged.
- It was widely agreed that this project will require sponsorship dollars in order to succeed. How much influence those sponsors have on defining the desired judging criteria was discussed and some degree of control on that needs to take place.

## RISKS / OPPORTUNITIES

- If a Technical Project Manager is not secured by May 2010, it will be difficult to influence 2011 budgets of potential sponsoring organizations.
- The window of opportunity for this novel web application contest idea may not be as viable later this year as it was last year when the idea was conceived.

## 6. BUDGET

• <u>Technical Project Manager</u>	\$24,000	
• <u>Contest Administrator</u> – (use Wash D.C. Apps for Democracy as a guide?)	\$30,000	
• <u>Assistance with development of Metadata for Mapping Services</u>	\$10,000	
• <u>Misc Support (travel, supplies, advertisement, etc)</u>	\$1,000	
• <u>Awards/Prizes (assume provided by sponsors? E.g., \$1,000 per award?)</u>	\$ 0?	(Partners)
	<b><u>\$65,000</u></b>	

## 7. PARTNERS (COMMITTED TO DATE)

- MetroGIS / Metropolitan Council (2010 budget)
  - a) \$15,000 for contest administration expenses,
  - b) Approximately a quarter time FTE for project/contest administration
  - c) 3,500 for metadata development to incentivize existing public interests to document and publish their existing geospatial data via web mapping services.

## IV. Proposed Solution and Desirability

### I. GENERAL DESCRIPTION OF PROPOSED SOLUTION

#### **December 2009-March 2010:**

- Create workgroup to lead effort until Technical Project Manager can be secured
- Clarify objectives, refine project plan (project charter)
- Clarify responsibilities of the Technical Project Manager and Administrative Project Manager
- Identify and secure agency(ies)/organization(s) partner commitments needed to host the contest
- Identify candidates/procurement method to fill Technical Project Manager role
- Create plan to expand number of map services available

#### **March-April 2010:**

- Secure Technical Project Manager
- Launch procurement process to secure contest administrator
- Obtain commitments for all other support roles

### **April– December 2010:**

- Set the ground work for the contest (pre-contest preparations)
- Engage data producers and expand number of web services available
- Establish contest rules and processes
- Identify possible award sponsors and secure commitments (set categories during rules creation)
- GIS/LIS conference (October 13-15) – advertise & educate, announce that the contest will begin in early 2011 and encourage data producers to participate by publishing their data as services and encourage application developers to be thinking about applications they could submit. .
- MN geospatial broker/commons (check availability of broker)

### **2011:**

- Contest runs approximately March through June
- Judging of entries in July and August
- Awards at 2011 GIS/LIS Conference in October

## 2. BENEFITS

### **IMPROVED SERVICE**

- Catalyzing of cross-sector sharing of data is expected to result in better data to support decision making and improved service delivery.
- Increased sharing of geospatial data, in the form of web mapping services, has been shown in other areas to catalyze development of applications that create public value and which are useful to the producer (e.g., BART, Washington D.C.), at no expense to the producers.

### **REDUCED COST**

- Changing an organization's business model to increasingly rely upon use of web mapping services as a means to make data available to others has the potential to greatly reduce costs in comparison with supporting data access requests manually.
- Use of web mapping services by the data user can greatly improve productivity over manually accessing data produced by others. The most recent version of the data is automatically received; saving time and effort because no need to manually update and store locally.

## 3. FEASIBILITY

**Explanation:** Three critical elements must be in place for a successful project, most likely by early spring 2010, to enable launching of the contest at the fall 2010 Mn GIS/LIS conference:

- Technical project manager
- Partner commitments (funding and/or support commitments)
- Contest sponsors (awards)

These commitments must be secured by volunteers who have limited time to dedicate to this project.

## 4. SUSTAINABILITY

### **Explanation:**

- **For the contest itself**, sustainability is not an issue as this contest is intended to be a onetime event.
- **For the Geo Applications** developed for this contest, the Technical Project Manager will oversee the development of contest criteria. Sustainability is anticipated to be one of several topics that will be discussed as candidates for judging criteria, along with usefulness and creativity.
- **Partnerships** will be identified to host web applications that provide public value and address shared information needs that cross sectors and agencies. These partnerships will be sustained as the applications are able to meet business needs.

## 5. ALTERNATE SOLUTIONS CONSIDERED, WITH ASSESSMENT

MetroGIS hosted two forums (January 2008 and November 2008) designed to define shared mapping services/web application needs for action by the MetroGIS community. The January forum produced a consensus on the roles that the MetroGIS should play regarding the definition of define priority shared

application needs and seeking collaborative solutions to them. At the December 2008 forum, several shared web service needs were defined and a solution to each has been implemented (e.g., geocoding service) or has been authorized (e.g., proximity finder and best image service). However, these forums and the resulting web services have not accomplished the objective of wide spread publication of web mapping services nor resulted in development of web applications that take advantage of them.

The proposed contest is viewed as a low-risk, low cost means to **accomplish the above-defined objectives** and **demonstrate tangible benefits** possible through expanded use of web services in a manner that **policy makers can compare and contrast to their existing business practices**.

## EXHIBIT 2

### **RESPONSIBILITIES AND QUALIFICATIONS – TECHNICAL PROJECT LEADER – GEO APPLICATIONS CONTEST**

#### **Responsibilities of Technical Project Leader:**

Project Leader will:

- Lead monthly meeting with advisory group
- Lead monthly meeting with other groups, as needed
- Lead development of fundraising strategy
- Define target participants/groups
- Lead development of bush-beating strategy
- Define conceptual judging strategies and preliminary criteria
- Facilitate a project definition meeting with stakeholders
- Develop a draft project plan to be approved by advisory group

The plan should include: fundraising strategy, understandable project charter with all benefits clearly defined, RFP for contest administrator, defined requirements framework for the contest, defined prizes and prize categories, outline for general judging criteria (what is important to us), contest timeline, defined criteria for providing code for applications submitted.

#### **Qualifications of Technical Project Leader**

- Has strong conceptual understanding of geospatial data, geospatial services and applications.
- Has understanding of the collaborative environment that has been cultivated in the Twin Cities metropolitan area and across greater Minnesota to widely leverage geospatial related investments that have been made by the various stakeholders.
- Has demonstrated experience serving in the capacity of a project manager, in particular, for projects that entail multiple participant organizations.
- Has statement from employer that they support the candidate serving in this capacity.

## ATTACHMENT D

### Geospatially Enabling Community Collaboration: The GECCo Initiative

*“...reduce and/or eliminate the vulnerability of the infrastructures of society’s complex technology systems that increase the difficulty for attacks on U.S. systems..”*



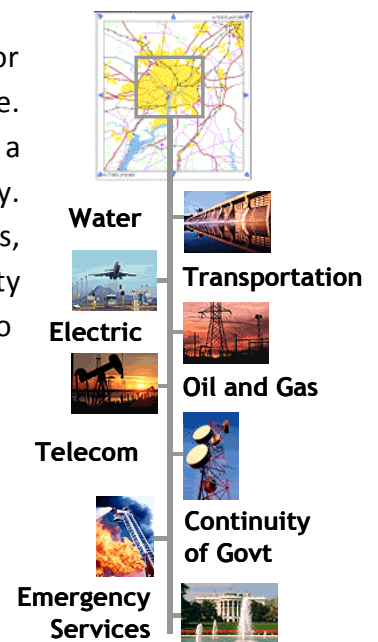
#### Excerpt, Homeland Security Presidential Directive 7

No matter the root cause of an emergency – terrorism, natural occurrences, or unintentional human error – the methods of preparing for, preventing, responding to, mitigating, and recovering from crisis are based on a common approach: the coordinated use of geospatial information to provide a common, spatially-based operational picture (map). This cannot happen without the many mutually dependent agencies and

public and private organizations charged with protecting our nation’s citizens and infrastructure being able to efficiently and effectively share their geospatial data. GITA’s GECCo initiative was developed to address the obstacles that need to be overcome before this can happen.

#### Purpose of the GECCo Initiative

Critical infrastructure is vital to a community that depends on it for economic security, quality of life, delivery of service, and governance. Disruption of one or more critical infrastructure assets would have a profound negative effect on all sectors within that community. Recognizing the importance of our infrastructure interdependencies, GITA began an initiative in 2004 called “Geospatially Enabling Community Collaboration,” or GECCo. The purpose of GECCo workshops is to facilitate an interactive dialogue at the local level among community infrastructure stakeholders to begin to address collaboration and information exchange issues that inhibit effective response and recovery in times of emergency. The workshops 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. This framework includes intra- and inter-organizational collaboration and coordination, effective practices and guidelines, information access and exchange, interoperability and enterprise architecture, and data and technology requirements.



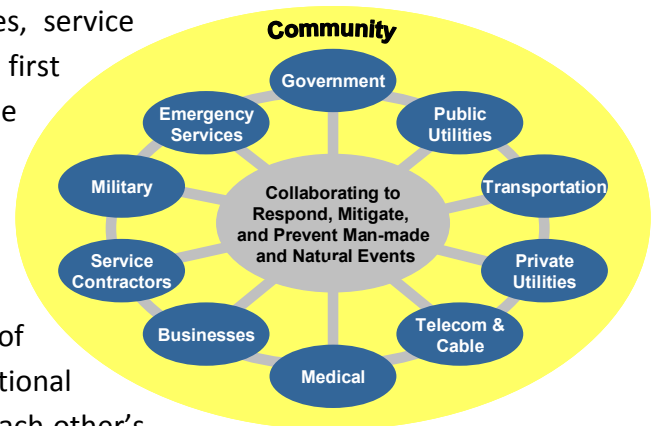
The outcome of each local or regional GECCo workshop is designed to enhance existing security-related efforts and enable community stakeholders to develop a framework so public and private organizations can better collaborate in order to protect critical infrastructure more effectively.

## Results to Date

GECCo workshops have been held successfully in Honolulu, HI, Denver, CO, Western New York State, Seattle, WA, Tampa, FL, and Phoenix, AZ. The two-day sessions have attracted an average of 45 representatives of local area utilities, local, state and federal government agencies, military units, first responders, and other user organizations. In each case, workshop participants gained valuable insight by identifying and discussing barriers to collaboration and how to overcome them, opportunities for sharing data, and defining keys to successful collaboration among local and regional organizations. In several cases following a GECCo, a local working group was established to continue to identify better ways to cooperate to provide for community infrastructure security. More recently, as part of an effort to integrate the GECCo program with national efforts, emphasis is being placed on ongoing federal directives and programs, such as the protected Critical Infrastructure program (PCII), the Homeland Infrastructure Foundation-Level Data (HiFLD) program, and the Homeland Security Infrastructure Program (HSIP).

## Community Collaboration

A community includes a variety of public and private organizations, including governmental agencies (local, state, and federal), public and private utilities, transportation, telecommunications and cable organizations, businesses, service contractors, military, emergency services and first responders, and other organizations. The goal of the GECCo initiative is to develop a replicable framework and tool set that stakeholders in communities across the U.S. can employ in constructing collaborative models for protecting critical infrastructure against both natural and man-made events. GITA's vision is a growing network of GECCo communities nationwide that contribute to national directives and programs, while continuing to gain from each other's experiences.



## About GITA

GITA is a non-profit association focused on providing education, information exchange, and applied research on the use and benefits of geospatial information and technology worldwide. Its membership includes federal, state, and local government agencies, utilities, infrastructure management organizations, and private sector companies. Visit us at [www.gita.org](http://www.gita.org).





*Cooperation, Coordination, Sharing Geographic Data*

**TO:** Policy Board

**FROM:** Coordinating Committee  
Chairperson: Sally Wakefield (1000 Friends of Mn)  
Staff Contact: Randall Johnson (651-602-1638)

**SUBJECT:** Glossary of Geospatial and GIS Terms

**DATE:** April 5, 2010  
(For the Apr 21<sup>st</sup> meeting)

### **REQUEST**

The Coordinating Committee respectfully submits the attached Glossary of Geospatial and GIS Terms to the Policy Board for its acceptance and recommends that it be managed as a living document.

### **COORDINATING COMMITTEE CONSIDERATION**

A work group of the Committee, headed up by Joella Givens (MnDOT) and Mike Fiebiger (Ramsey County), refined the subject glossary for the Committee's consideration. This activity was undertaken in response to a request from Chairperson Schneider.

At its meeting on March 17, the Committee accepted the listing of terms as presented in this report. The only concern raised was if the listing of terms is to continue to include proprietary products (i.e., ArcGIS, MrSID) all similar products should also be included. The Committee compromised by asking staff to add a preamble stating that this listing of terms is intended to be a starting place and as the need for additional terms is recognized that they be added. The group concurred with the goal for this document to be managed as "living" and that posting it in an Internet environment would enable users to offer modifications.

### **REFINEMENT FOLLOWING COMMITTEE CONSIDERATION**

During discussion to develop the agenda for the April Board meeting, and in response to the Committee's concern for including proprietary terms, Chairperson Schneider suggested that the terms be separated into two listings – User Terminology and Proprietary Terms/Products – for the recommendation to the Board.

This idea was shared with the Workgroup and they believe that terms should be called out (\*\*) but not moved to a separate listing to simplify the user experience. The later method is used in the attached version. Which method is preferred by the Board members – the target audience?

### **ACHIEVING GOAL OF A LIVING DOCUMENT**

This goal can be met in a couple of ways. The simplest being to post the document on the MetroGIS website with a link from the front page so it is easily found by Policy Board and Committee members. Any desired modifications would be submitted to MetroGIS staff. The MetroGIS web site does not have the capacity to support online editing. Staff would be responsible for monitoring the listing of terms for any needed modifications and additions.

Other options investigated (SharePoint and Wikipedia) have drawbacks that do not make them as attractive as posting on the MetroGIS site, at least not at the present time. If SharePoint is used, a stakeholder origination would have to host the site. In the past, these sites have had restricted access – only preregistered persons are permitted to access the site. Stakeholder support would also be required. Such requests should be limited to only critical support needs. The Wikipedia option does not appear to allow for presenting the listing of terms in the document format presented in this report, making it difficult for Board members to locate terms directly relevant to our particular situation here in the Twin Cities. On the positive side, anyone would wanted to offer modifications could to so.

### **RECOMMENDATION**

That the Policy Board:

- 1) Accept the Coordinating Committee's attached proposed Glossary of Geospatial and GIS Terminology.
- 2) Direct staff to post these terms on the MetroGIS Website, as described herein.

## **GLOSSARY OF GEOSPATIAL AND GIS TERMINOLOGY**

**PREAMBLE:** *This listing of geospatial terms was developed at the direction of the MetroGIS Policy Board to help its members better understand recommendations they are asked to consider. This listing is intended to be a starting place and that as the need arises, additions and modifications are to be incorporated. Users are encouraged to offer such modifications as they recognize the need. Proprietary Terms/Products are followed by “\*\*”. It is understood that the listing of these terms is incomplete.*

### **GEOSPATIAL AND GIS TERMINOLOGY**

**ArcGIS\*\*:** A collection of software products developed by ESRI. This includes ArcView, ArcEditor, and ArcInfo levels of functionality as well as the main applications of ArcMap, ArcCatalog, and ArcToolbox.

**Annotation:** Descriptive text used to label geographic features on a map. This text is used for display rather than analysis.

**Application:** A program (software) or web mapping service designed to perform a specific task. Examples include word processing software, database programs, and mapping tools.

GIS applications can be used to solve problems, automate tasks, and generate information within a specific field of interest. They can also be used to search, analyze, and map data to answer particular questions.

**Arc:** An ordered string of vertices (x, y coordinate pairs) that begin at one location and end at another. Connecting the arc's vertices creates a line. The vertices at each endpoint of an arc called nodes.

**Attribute:** Descriptive information about a geographic feature or location that is usually stored in a table. Examples include ownership of a parcel of land, the population of a neighborhood, or the speed limit or name of a road.

**Basemap:** A map containing geographic features used for locational reference. Roads are commonly found on basemaps.

**Best Practice or Best Management Practice:** A recognized technique, method, or process related to developing, documenting, managing, sharing, distributing, or utilizing geographic data or applications which promotes consistency and compatibility of the data. It is a reflection of what the GIS community has found to work most efficiently and effectively. Best practices or guidelines may evolve into standards when officially adopted and mandated.

**Broker:** A searchable catalog or directory of datasets and services that provide information about resource availability and accessibility. This is similar to conducting a Google search, then following a link to the information of interest.

The broker function facilitates enforcement of requisite standards and protocols, as well as possibly providing authentication (security) services. Examples include the Federal Geographic Data Committee (FGDC) Clearinghouse and Geospatial One-Stop (Geodata.gov) sites. The Clearinghouse provides a single point of contact regarding available resources while at the same time tracking data accessibility. Geodata.gov provides access to maps, data and other geospatial services.

**Buffer:** A zone of a specified distance around coverage features, useful for proximity analysis.

**Business Information Need:** Data needed to accomplish a business task. For example, needing to know the owner of a parcel of property in order to contact them, needing to know which community a particular property is located, or finding the drainage outlet for a particular wetland.

**Cadastre:** An official record of dimensions, land value, and ownership used to calculate taxes.

**Cadastral Survey:** A boundary survey taken for the purposes of ownership and taxation.

**Cartography:** The art and science of making maps.

**Catalog:** A collection of data or metadata that is searchable and often organized by category, to assist the discovery and retrieval of datasets or services.

**Catalog Entry:** An item in the list of contents of a catalog that is searchable by keyword or category for example.

**Clearinghouse:** A central institution or agency for the collection, maintenance, and distribution of information, metadata, and data. A clearinghouse provides widespread access to information and is generally thought of as reaching or existing outside organizational boundaries.

**Clip:** The spatial extraction of those features from one map layer that reside entirely within a boundary defined by features in another map layer, much like a cookie cutter.

**Coordinate:** A set of numbers (x, y values) that designate location in a given reference system (coordinate system). Coordinates represent locations on the Earth's surface relative to other locations.

**Consensus:** General agreement or accord about a particular decision. This is the preferred means of decision-making by MetroGIS.

**DataFinder:** A one-stop-shop for finding geospatial data pertaining to the seven county Twin Cities metropolitan area. Its primary function is to facilitate sharing of GIS data among organizations and provides metadata describing GIS datasets, which can be directly downloaded or used via web services.

**DataFinder Café:** An interactive tool for viewing and downloading GIS datasets. It allows users to download datasets by user defined geographic extents or selections. The Café also allows users to browse GIS datasets, print maps, and save mapping sessions for later use or for sharing with others.

**Data Standard:** An approved model of what data should be recorded, how data should be recorded, and how data should be supported by a system in order to retain its full meaning.

A standard should be a well defined set of properties or specifications for measuring acceptability, quality, and accuracy for a specific type of data which is accepted as correct by custom, consent, or authority that facilitates the creation, use, or dissemination of such data.

**Dataset:** A collection of related data, which is grouped or stored together.

**Datum:** The reference location from which measurements of the Earth are made. A datum defines the size and shape of the Earth and the origin and orientation of the coordinate systems used to map the Earth. Knowing the datum is important because referencing the wrong datum can result in significant error.

**Endorsed Regional Solution:** Specifications for geospatial data that benefit the user community which have been approved by a regional entity such as MetroGIS. The endorsement of a regional dataset involves guidelines for access, content, and distribution in order to provide a consistent dataset across the region's jurisdictions.

**Field:** In a database, another term for column.

**Geocoding:** A GIS process for converting street addresses, intersections or named locations

into spatial data that can be displayed or mapped. For example, the geographic location for an address may be found by comparing it to reference data, such as address points, street centerlines or zip code boundaries. Reverse geocoding is the opposite, for example finding attribute information from a point on a map.

**Geocoding Service (Address Locator):** A service that allows the user to geocode non-spatial data using a web or desktop application.

**Geographic Data (Geospatial Data):** Data having two components: spatial and attribute. The spatial component is the location of the feature data in map coordinates. The attribute component is the data that describes the feature.

Examples of spatial data:

- point: fire hydrant
- line: street
- polygon: parcel boundary
- raster: aerial photography or shaded relief

Examples of attributes data:

- fire hydrant: diameter of pipe
- street: street name
- parcel: property owner name
- shaded relief: elevation

**Geographic Information System (GIS):** An organized collection of computer hardware, software, geographic data, and personnel designed to collect, store, update, manipulate, analyze and display geographic information. GIS is the merging of database technology and cartography.

**Georeferencing:** A process for aligning geographic data to a known coordinate system so it can be used with other geographic data. Georeferencing may involve shifting, rotating, scaling, and rubber sheeting (stretching) the data or image. This method is not as precise as orthorectification.

**Geospatial Web (GeoWeb):** A relatively new term that reflects a blending of geographic (location-based) information with information from the Internet. This has created an environment where searches can be based on location as well as keywords.

The GeoWeb is currently characterized by geo-browsers such as [Google Earth](#), [Google Maps](#), [Bing Maps](#), and [Yahoo Maps](#).

**Global Positioning System (GPS):** A system of global navigation satellites used for determining location on the earth. A GPS can be very accurate, making it a useful tool for surveying and GIS as well as navigation.

**Hydrography:** The measurement and description of water bodies.

**Infrastructure:** The system of human-made physical structures that provide communication, transportation, utilities and other public services including hospitals, police and fire stations. This information is often included within a core set of GIS data. Also refers to the collection of computers, servers, other related hardware and connecting cables that allow a group of computer users to communicate and share information.

**Interoperability:** The capability of components or systems to exchange data with other components or systems, or to perform in multiple environments. For example, interoperability is required for a GIS user using software from one vendor to study data compiled with GIS software from a different provider.

**Layer:** A thematic set of spatial data, layers are organized by subject matter.

**Legend:** The reference area on a map that lists and explains the colors, symbols, line patterns,

shadings and annotations used on the map; the symbol key to interpret the map.

**Light Detection and Ranging (LIDAR):** An optical remote sensing technique that uses laser pulses to determine elevation with high accuracy.

**Line:** A set of ordered coordinate pairs that represent a linear feature with no area, or with a shape too narrow to be displayed as a polygon.

**Map:** A graphic representation of geospatial data. A map displays data.

**Map Projection:** A mathematical model that transforms the locations of features on the Earth's surface (sphere) to locations on a two-dimensional surface (flat map).

**Mashup:** A mixture or combination of content, elements, or scripts from multiple sources or websites. For example, one could add schools information from the Department of Education and public transportation routes from MetroGIS to a Google Map.

**Metadata:** Information that describes the content, quality, condition, origin, and other characteristics of data. Metadata answers questions about how, when and where the data was collected. It can also provide information about origin, source, reliability and accuracy.

**MetroGIS:** A geospatial collaborative organization serving the Twin Cities metropolitan area. Its primary functions focus on: a) the development and implementation of a collaborative regional solution for sharing information needs (e.g., geospatial data, related applications, standards and best practices), b) widespread sharing of geospatial data via DataFinder.org website, c) the value of GIS technology as a core business tool, and d) sharing knowledge relevant to the advancement of GIS technology. Beneficiaries of these efforts include local and regional governments, as well as, state and federal government, academic institutions, nonprofit organizations and business interests.

Distinguishing Characteristics include:

- Unincorporated organization *-no mandate or legal standing*
- Cannot own data, receive, or spend funds *-rely on stakeholders*
- Elected officials comprise the Policy Board
- Consensus-based decisions on matters fundamental to success
- Voluntary compliance for endorsed policies/procedures
- Forum to foster collaboration on a breadth of shared geospatial program needs *- more than just data.*

**Metropolitan Area:** The seven county service area of the Metropolitan Council. Governments within Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties are represented on the MetroGIS Policy Board.

**Metropolitan Council:** A 17-member council that serves as a regional planning organization for the seven-county Twin Cities metropolitan area.

The council runs the regional bus and light rail system, collects and treats wastewater, manages regional water resources, plans regional parks, and administers funds that provide housing opportunities for low and moderate income individuals and families.

**Minnesota Geospatial Information Office (MnGeo):** Established in May 2009, this is the first state agency in Minnesota with legislatively defined responsibility for coordinating GIS within Minnesota. The organizational structure includes two advisory committees that make recommendations to the Chief Geospatial Information Officer (CGIO). These committees include a statewide geospatial advisory council and a state agency advisory council.

**MrSID\*\*:** MrSID is a compression format applied to raster data, most commonly aerial photos.

**National Spatial Data Infrastructure (NSDI):** The technologies, policies and people necessary to promote sharing of geospatial data throughout all levels of government, the private and non-profit sectors, and the academic community. The goal is to reduce duplication of effort among agencies, improve quality and reduce costs related to geographic information, to make

geographic data more accessible to the public, to increase the benefits of using available data, and to establish key partnerships with states, counties, cities, tribal nations, academia and the private sector to increase data availability.

**Open Geospatial Consortium (OGC):** The OGC is a non-profit, international, voluntary consensus standards organization that is leading the development of standards for geospatial and location based services.

**Open Source Data Model:** A standard that has members of the GIS user communities cooperatively working to correct and improve spatial data and attributes in exchange for less restrictive uses of the data.

**Open Source Software:** A program in which the source code is available to the user for their use and/or modification from its original design free of charge. Open source code is typically created as a collaborative effort in which programmers improve upon the code and share the changes within the community. The result of this collaboration is the fast and affordable development of high quality technologies and software products.

**Orthophotography (Orthoimagery):** An aerial photograph geometrically corrected so that the scale is uniform and distortion is corrected to remove camera tilt and/or ground relief. This is similar to georeferencing an aerial photo, but much more accurate.

**Peer Review Forums:** A facilitated event at which users of a particular regional solution are invited to share ideas on how to improve the solution, including but not limited to data content, access and custodial responsibilities.

Through these events, MetroGIS identifies ways to ensure that solutions maintain their relevance with changing user needs, and leverage resources that were not available when the solution was implemented.

**Point:** A single x, y coordinate point that represents a geographic feature.

**Polygon:** A representation of an area defined by lines that make up its boundary. For example, it may represent a building footprint, parcel, city limits, or country's boundary.

**Projection:** A mathematical model that transforms the locations of features on the Earth's surface (sphere) to locations on a two-dimensional surface (flat map).

**Raster:** A way of representing geographic features by dividing the world into discrete squares called cells. Aerial photos are a common example of raster data.

**Remote Sensing:** The process of acquiring information about an object without contacting it physically. Methods include aerial photography, radar, and satellite imaging.

**Service Broker:** A searchable catalog or directory of services that provides information about resource availability and accessibility.

**Services:** Reusable, self-contained collections of executable software components. They are software that can work in different operating systems, networks and application frameworks. They are basic to creating highly integrated and distributed application systems. GIS data is often provided via a web service. Spatial data served out by one organization via a web service can be consumed by GIS users with access to the web and the software to consume the service.

**Shapefile:** A shapefile is a dataset that is associated with ESRI's GIS software products. Shapefiles contain spatial geometry (points, lines, polygons) in multiple files.

**Shared Business Information Need:** Information needed to carry out the business of more than one organization.

**SOAP:** Is an acronym for **SIMPLE OBJECT ACCESS PROTOCOL** which is a XML (defined below) based protocol developed for exchanging information between peers in a decentralized, diverse environment. **SOAP** allows programs on different computers to

communicate regardless of operating system or platform; it is used in Web Services.

**Spatial Data (Geospatial Data):** Information about the locations and shapes of geographic features, which are often stored as coordinates and topology, data that can be mapped.

**Spatial Data Infrastructure (SDI):** A framework that facilitates access to geographic information using a minimum set of standard practices, protocols, and specifications.

**Stakeholder:** A person, group or organization with an existing or potential interest in MetroGIS. This includes both users of its services and contributors.

**Succession Planning:** Strategies to accomplish successful transitions in leadership roles critical to an organization's long term success (e.g., committees, staff support, and advocates within critical stakeholder organizations).

**Topology:** The spatial relationship between geographic objects. For example, topological information for a city boundary would include the names of adjacent cities.

**Vector:** A coordinate based data structure commonly used to representing geographic features as an ordered list of vertices.

**“View only” Access:** Data is displayed as a map, graphic or summary table. A user may print or save the displayed information, but cannot download or edit the data.

**Web Coverage Service (WCS):** An interface standard of the Open Geospatial Consortium (OGC) that provides geographical coverages (e.g. aerial photography, land cover data, digital elevation models) across the web using platform independent calls. The coverages are provided as objects that can be spatially analyzed by the end user.

**Web Services:** GIS Web Services are self-contained application components that can be published or accessed over the World Wide Web. Each performs a specific GIS function as part of a larger web site, portal or business application.

**Web Feature Service (WFS):** A Web Service that allows a user to request, create, update, delete and/or save geospatial data as if it were on the user's own computer or network.

**Web Mapping Service (WMS):** A Web Service that permits a user to request and obtain a *map image*, which can be viewed on its own or with other geospatial data. The image created by the WMS cannot be edited but it can be combined with other WMS data as well as locally stored data. A WMS is a virtual copy of the geospatial data, meaning that when the user's computer is shut off, the map image is no longer available.

**WIKI:** A website that allows the creation and editing of any number of interlinked web pages through a web browser. They are often used in an ongoing process of creation and collaboration that promotes meaningful discussion and teamwork across the web.

**XML (eXtensible Markup Language):** A standardized general purpose language for designing text formats that allows the interchange of data between computer applications. XML is designed for creating web documents such as the production of GIS metadata.

---

## REFERENCES

Black's Law Dictionary

Folger, Peter. *Geospatial Information and Geographic Information Systems (GIS): Current Issues and Future Challenges*. A Congressional Research Service Report June 8, 2009.

*GIS Dictionary*. ESRI Support Center, 31 Oct. 2006.

<http://support.esri.com/index.cfm?fa=knowledgebase.gisDictionary.browse&letter=S>

*Glossary*. Digimap Jersey, 6 May 2006.

<http://www.digimap.je/node/17>

MetroGIS, 20 Oct. 2009.

<http://www.metrogis.org/index.shtml>

Minnesota Geospatial Information Office, 2009.

<http://www.mngeo.state.mn.us>

*Minnesota State GIS Enterprise Conceptual Architecture Design*. Minnesota Governor's Council on Geographic Information, 23 March 2005.

<http://www.gis.state.mn.us/pdf/MNGISConceptualArchitectureDesign.pdf>

MSDN Library. Microsoft Developer Network

*National Spatial Data Infrastructure*. Federal Geographic Data Committee, 2009.

<http://www.fgdc.gov/nsdi/nsdi.html>

*The OpenGIS Abstract Specification; Topic 13: Catalog Services; version 4*. Open GIS Consortium, 1999.

<http://www.opengeospatial.org/standards/as>

*Spatial Data infrastructures*. ANZLIC the Spatial Information Council, 2010

<http://www.anzlic.org.au/infrastructure.html>

Wade, Tasha, and Shelly, Sommer, eds. *A to Z GIS: An illustrated dictionary of geographic information systems*. Redlands, California: ESRI Press, 2006.

Wikipedia, 2010.

[http://en.wikipedia.org/wiki/Main\\_Page](http://en.wikipedia.org/wiki/Main_Page)