

**NSDI FRAMEWORK DEMONSTRATION PROJECTS PROGRAM  
ANNOUNCEMENT NO. 1434-HQ-98-PA-00045**

**TITLE: Sustainable Organizational and Financial Models for Framework Collaboratives**

The Metropolitan Council of the Twin Cities is proposing this FDPP Category 3 project on behalf of MetroGIS. Conceived in late 1995 as a multi-jurisdictional regional GIS data sharing effort, MetroGIS is governed by a twelve-member Policy Board that reflects exceptionally broad and deep support for collaboration. Project participants have expressed strong and long-standing commitments to NSDI Framework goals through their actions, but this grant is needed to ensure that institutional and financial issues critical to sustaining the MetroGIS effort are systematically addressed and documented. We believe that MetroGIS is an especially unique and important project that, if successful, has enormous value as a model for other efforts needed to successfully achieve the goals of the NSDI Framework.

**1. PROJECT RELEVANCE TO THE NSDI FRAMEWORK**

**A. Project Overview**

Minnesota organizations have a long tradition of cooperatively using GIS technology to address issues that significantly affect quality of life. The most recent example is MetroGIS<sup>1</sup>, a multi-participant project<sup>2</sup> serving the seven county Minneapolis-St. Paul Metropolitan Area. A fundamental MetroGIS premise is that local governments can most effectively carry out their responsibilities by sharing data and developing collaborative solutions to GIS implementation. If the NSDI is to succeed, projects such as MetroGIS serve as basic building blocks.

MetroGIS is guided by a seemingly simple vision statement, forged through an intensive consensus-building process and endorsed by each local government organization critical to the success of MetroGIS. The vision:

*Provide an ongoing, stakeholder-governed, metro-wide mechanism through which participants easily and equitably share geographically referenced graphic and associated attribute data that are accurate, current, secure, of common benefit, and readily useable.*

Significant progress towards this vision has been made, thanks to substantial financial and resource commitments made by the Metropolitan Council and several hundred people representing dozens of cooperating organizations. Nonetheless, significant work will be needed to nurture MetroGIS as its stakeholders strive towards consensus about strategies to sustain the effort. This consensus must be reached while the window of opportunity made possible by the significant initial investment remains open. The work supported by this grant is considered essential to reaching that goal.

**(1) Project Goals and Objectives.** Our objective, then, is to complete the work needed to ensure the long-term viability of MetroGIS. This effort also will clarify some of the most

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<sup>1</sup> MetroGIS was conceived in December 1995 at a strategic planning retreat attended by twenty representatives of public and private organizations serving the metro area, including Michael Domaratz of the FGDC. By March 1996, a common vision had been adopted and the Metropolitan Council had agreed to provide significant financing. By Fall 1996, MetroGIS principles had been endorsed by governing bodies for all key stakeholders and a Policy Board had been created; it first met in January 1997. See Attachment A for descriptions of each of the strategic initiatives.

<sup>2</sup> Elected officials from eleven organizations, representing all forms of local government serving the Twin Cities metropolitan area, comprise the MetroGIS Policy Board. Each organization has adopted a resolution acknowledging and supporting the principles of MetroGIS. See Attachment B for a list of Board members and their respective organizations.

problematical institutional issues faced by all attempts to fulfill the data integration role envisioned by the NSDI framework. This project will undertake the following specific activities:

- Build upon and refine the NSDI Framework Functions to clarify appropriate roles for data producers and integrators while addressing priority information needs of key MetroGIS stakeholders applicable to NSDI Framework Data elements.
- Estimate the costs for sustaining data sharing mechanisms consistent with the MetroGIS vision and with the roles and responsibilities needed to support the NSDI framework.
- Prepare “balance sheets” to help clarify the net value of collaboration to potential participants, focusing on framework functions as well as costs and benefits.
- Develop guidelines for equitably allocating the costs of MetroGIS among its stakeholders.
- Document project results, focusing particularly on financial and organizational issues that must be resolved for the NSDI framework model to succeed.

**(2) Contribution to the Framework.** For MetroGIS to succeed, consensus must be reached about equitably sharing its costs. This inherently involves identifying the costs of collaborative data integration and balancing the needs and perspectives of data producers and data users. We believe that a fundamental NSDI assumption — that locally produced data can be integrated for local, regional, state and national applications, without restricted access and at virtually no expense — is at risk until this equity issue is resolved. Among the most contentious obstacles is the historical practice of cost-recovery for non-federal GIS programs. MetroGIS offers an opportunity to address these issues, benefiting both MetroGIS and NSDI efforts elsewhere.

By leveraging the efforts of broadly representative interests to address common information needs, identify costs of sharing data, define equitable cost allocation strategies that account for potential revenue losses, and devise effective institutional relationships to sustain MetroGIS, this project provides an important opportunity to test a fundamental NSDI premise — that local data producers are likely to function as effective partners in a national effort.

**(3) Relevance to Other NSDI Efforts.** MetroGIS as a whole, and this project in particular, is an important model for other NSDI efforts. Few sustained attempts to match elements of the proposed NSDI framework with local and regional needs exist, certainly not on the scale of MetroGIS. This project, in seeking to empirically derive some of the practical conditions for cooperation tests some of the normative assumptions of the NSDI. The public officials that comprise the MetroGIS Policy Board provide the ultimate reality check!

This project builds upon other efforts, particularly 1996 FDPP grant to the State of Minnesota that demonstrates the extent to which local, regional and state perspectives on data needs diverge from those of the framework. The work proposed here also reflects the premise that collaborations such as the NSDI framework must depend not simply on good will but on good sense — the investments required to integrate and manage aggregated data are real and cannot be justified on good will alone. Work undertaken for MetroGIS has focused attention on the region’s shared information needs. We now know that several resemble those required for the framework, but it is also clear that the interests diverge. This project seeks to put a dollar figure on bridging the gap.

## **B. Compliance with FGDC Geospatial Standards**

This project will promote understanding of FGDC geospatial standards within the region and identify operational and technical issues related to local and regional compliance. FGDC standards primarily reflect the collective needs of federal agencies, despite substantial efforts to accommodate non-federal interests. Since the framework model assigns significant roles to local data producers and area integrators, local compliance with FGDC standards depends greatly upon a convergence of interest among local producers, area integrators and the FGDC. Within this context, the MetroGIS Policy Board and the greater Minnesota GIS community are strong advocates of geospatial standards adopted by the FGDC.

**(1) Documentation of Data Holdings.** Minnesota and MetroGIS are strongly committed to documenting geospatial data and have backed this commitment with action. The context for MetroGIS efforts are documentation guidelines developed by a committee chaired by LMIC staff and adopted by the Minnesota Governor's Council on Geographic Information. These Minnesota metadata specifications<sup>3</sup> are derived from the FGDC metadata standard and reflect a demanding effort to balance the need for extensive standardized documentation and the need for user acceptance. They include all FGDC core metadata elements and comply with specifications required for searches conducted through the NSDI Clearinghouse gateway.

The Minnesota guidelines have been widely promoted at workshops and conferences, metadata documentation tools have been developed and widely distributed for no charge, and data holdings are being documented by state agencies, regional programs, counties, cities and organizations within the private sector. The guidelines and their use were featured in last year's nationally downlinked video metadata workshop produced by the University of Wisconsin-Madison.

The MetroGIS Policy Board adopted the *Minnesota Geographic Metadata Guidelines* on January 28, 1998 and is promoting them among MetroGIS stakeholders. GIS Data and Cost Sharing Agreements between the Metropolitan Council and MetroGIS counties provide funds for the creation and maintenance of metadata, using those guidelines.

**(2) Public Access to Metadata Through the Internet.** Access to geospatial data through the Internet is fundamental to fulfilling the MetroGIS vision. Moreover, the Metropolitan Council has expressed its intent to develop a regional node as part of the Minnesota Geographic Information Clearinghouse, a statewide project being coordinated by the Minnesota Land Management Information Center with direction from the Governor's Council on Geographic Information. The Minnesota Geographic Information Clearinghouse, in prototype form, is searchable through the NSDI Clearinghouse gateway.

MetroGIS has chosen to provide access to metadata through *Data Finder*, which offers a custom designed, user friendly-interface that searches metadata descriptions that conform to the *Minnesota Geographic Metadata Guidelines*. A prototype of *Data Finder* was recently evaluated by MetroGIS participants and a working version will be implemented this spring. *Data Finder* will allow users to search by theme, place or organization and to view the complete metadata profile. In some cases data will be distributed through *Data Finder*. Data sharing agreements between the Metropolitan Council and each of the seven metro area counties also promote data transfer via the Internet.<sup>4</sup>

*Data Finder* represents a useful example of local solutions that conform to NSDI principles but which diverge in their implementation because of local conditions. While *Data Finder* uses

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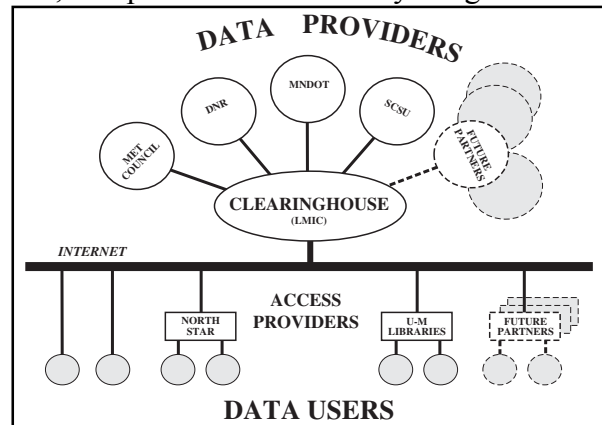
<sup>3</sup> The Minnesota guidelines are described on the LMIC web site at <http://www.lmic.state.mn.us/gc/stds/metadata.htm>.

<sup>4</sup> Each of the agreements seeks the same objectives, although the specific language varies for each to accommodate unique needs. An excerpt of the Internet access provisions for Anoka County is presented in Attachment C.

standardized metadata profiles, its indexing and searching architecture is unique to MetroGIS, reflecting the interests expressed by local participants. By funding this project, the FGDC will help clarify the work needed to modify *Data Finder* to function as a node of the Minnesota and NSDI Clearinghouse sites while also providing constructive feedback to the NSDI effort.

**(3) Relationship to National Geospatial Data Clearinghouse.** The National Geospatial Data Clearinghouse approach calls for a distributed network of local, regional, state and federal Internet sites, all conforming to consistent standards, that provide for a virtually integrated clearinghouse function. Metadata is a strategic link. MetroGIS and the Minnesota Governor's Council on Geographic Information have made commitments to be partners in this vision.

The Minnesota Governor's Council on Geographic Information report *Laying the Foundation for a Geographic Data Clearinghouse*<sup>5</sup> describes the principles and strategies for developing and implementing a statewide clearinghouse. The Minnesota clearinghouse architecture, shown above, provides for regional nodes maintained by strategic clearinghouse partners. The Metropolitan Council, on behalf of MetroGIS, will maintain one of those nodes. A Minnesota clearinghouse prototype developed by LMIC is available through the NSDI Clearinghouse gateway in Reston, VA. One of the remaining challenges for MetroGIS is to identify the technical, organizational, and institutional requirements of participating as a node within the Minnesota clearinghouse.



The Minnesota clearinghouse, when fully functional, will be accessible through State of Minnesota's Northstar home page at <http://www.state.mn.us>. Northstar offers a single point of entry to public World Wide Web sites throughout the state. It will also be accessible, of course, through the NSDI clearinghouse gateway.

## 2. PROJECT DESCRIPTION AND WORKPLAN

This project addresses several fundamental issues that affect the likelihood of success for the NSDI. While this project starts with a fundamental belief in framework goals, it also questions one of its core premises — that added costs associated with participation offer enough value to collaborating organizations that they will provide long-term financial support for the effort. We hold no predispositions regarding the answer to this question, but a practical answer is needed. If a clear and practical commitment to financing the MetroGIS collaborative project can be obtained, then it will serve as a model for others.

Work on this project involves four tasks, to be conducted over twelve months beginning on October 1, 1998. Since the project is related to ongoing MetroGIS work, the specific activities may vary somewhat. However, this project plan reflects our best attempt to describe the effort needed. A budget and project schedule are included as attachments. Basic project tasks include:

- Task A: Clarify Appropriate Roles and Framework Functions
- Task B: Estimate Costs of Collaboration
- Task C: Devise Fair-Share Financing Model
- Task D: Document Project Results

<sup>5</sup> The report can be found at: <http://www.mnplan.state.mn.us/press/gisclear.html>.

A project coordination team will be supported by project staff working in collaboration with a contractor experienced with multi-participant local government GIS programs and knowledgeable about the NSDI framework. MetroGIS committees and workgroups would provide appropriate input.

**A. Clarify Appropriate Roles and Framework Functions**

Task A will address framework functions as they pertain to MetroGIS, focusing especially on appropriate roles for MetroGIS participants. Some of these functions already have been assigned by MetroGIS, particularly those involving executive guidance and coordination. However, as MetroGIS increasingly focuses on specific needs, the challenge of identifying appropriate roles becomes more difficult.

**(1) The NSDI Framework Functions.** In *Framework: Introduction and Guide*, the FGDC identifies seven functions as essential to achieving NSDI framework goals:

- Executive Guidance
- Coordination
- Data Access
- Data Development, Maintenance & Integration
- Data Management
- Monitoring and Response
- Resource Management

Several of these have been addressed already by MetroGIS, especially those related to executive guidance and coordination. However, the framework functions have neither been systematically considered for the entire effort nor specifically considered for each of the framework elements. This project will attempt to do so. All of the cells in the following schematic would need attention to fully comply with the framework model. This project will focus on those symbolized by a check mark [ ] .

Function	Element						
	Geodetic	Cadastral	Gov. Units	Transport	Elevation	Hydrograph	Orthophoto
Executive Guidance							
Coordination							
Data Access							
Dvpt. Maint & Int							
Management							
Monitoring &							
Resource Mgt							

**(2) MetroGIS Priority Information Needs.** The Jurisdictional Boundaries Task Force of the MetroGIS Data Content Advisory Team has devised a model process to reach consensus about data specifications, candidate data custodians, and custodian responsibilities for MetroGIS information needs. However, all of the framework functions have not been considered. This project would expand and refine the advisory team’s process to more comprehensively address all seven functions.

This expanded process will be applied for the three high priority information needs for MetroGIS that were identified as a result of many months of collaborative work, based upon an

integrated business model and comprehensive survey. The three needs — Jurisdictional Boundaries, Parcels, and Address Locations— have been endorsed by the MetroGIS Policy Board and correspond to the NSDI framework themes for Governmental Units, Cadastral Features, and Transportation.

**(3) Clarify Appropriate Roles and Responsibilities.** Work will focus on clearly defining the appropriate organizations and their roles and responsibilities to effectively produce, integrate, maintain, document, and share these data.<sup>6</sup> A task objective is to identify one or more suitable custodians for data required to meet each information need. The ability of each candidate to carry out applicable framework functions will be evaluated.

## **B. Estimate Costs of Collaboration**

Achieving the goals envisioned by MetroGIS, particularly if it is to fully comply with the framework model, is not cost-free. For every role or responsibility assumed by an organization that requires work not otherwise associated with its existing operations, a burden is placed on some tax-paying constituency. Collaboration, to be sustained over time, demands no unjustifiable costs. Our problem: little empirical documentation of those costs is available. This task will try to provide the needed documentation.

**(1) Develop Cost Profiles.** Costs profiles will be built for each of the MetroGIS high priority information needs, accounting for all seven framework functions, where applicable. For each need, costs will be estimated for the following:

- ***Data Development, Maintenance, Integration and Management.*** Among the costs that will be considered are those for developing new data needed by MetroGIS, maintaining existing data, integrating data from local sources, developing procedures to support transactional updating from contributors. These include costs for developing operational data specifications and the costs of horizontal across boundaries and vertical integration among city, county and regional organizations.
- ***Data Access.*** The project will define roles and responsibilities of contributors to the MetroGIS data searching and distribution mechanism, *Data Finder* and estimate their costs. This includes costs for work to bring *Data Finder* into full compliance with NSDI's Clearinghouse specifications. Modifications will be made if it is determined that they suit the interests of MetroGIS and adequate resources are available.
- ***Education and Training.*** Consideration will be given to costs associated with educating and training staff from participating organizations to effectively use GIS and to continuing education about data sharing, technology, data, and other issues related to the framework.
- ***Administration and Outreach.*** These include estimates made from actual costs incurred to support the MetroGIS Policy Board, its Coordinating Committee, and the Advisory Teams. They include communication and promotion costs: the MetroGIS web site and *Coordinates* newsletter, conferences, efforts to keep decision-makers informed about issues and opportunities, and efforts to extend the program to other participants.

**(2) Estimate Costs for Other Information Needs.** Based upon the cost profiles developed for the three high-priority MetroGIS needs that correspond to framework elements, estimate will be developed for other MetroGIS information needs considered essential to maintain the support of the region's collaborating organizations. Though some of these have no direct framework

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<sup>6</sup> An example of the function matrix envisioned for each priority MetroGIS information need is presented in Attachment F.

equivalent, the case for a sustained local commitment to MetroGIS cannot be expected unless these needs are included in the analysis. The final results are expected to be applicable to a variety of other multi-participant GIS efforts throughout the nation.

### C. Design Fair-Share Financing Model

Despite the vision and leadership that has nurtured MetroGIS since its beginning, participants retain a healthy skepticism about its value to their own organizations. This condition is especially true for data producers, who are being asked to freely provide data to organizations that had previously been data-purchasers. Achieving the goals of MetroGIS — and the NSDI for that matter — depends greatly on demonstrating net benefits for all participants. An equitable model for financing collaborative efforts is essential, especially for framework collaborations.

With financial support from the Metropolitan Council, Interim GIS Data and Cost Sharing agreements have been executed for the region's principal data producers — the counties. The agreements have established the initial conditions for data sharing, but they begin to expire in 2000. By building “collaboration balance sheets” for high-priority data elements, we hope to identify the conditions required to build a defensible case for a long term, sustainable mechanism before the terms of the interim agreements begin to expire. These balance sheets, in turn, would be used to design a “Fair Share” model for sustained financing of MetroGIS.

**(1) Design Principles.** This task will identify potential solutions to the equity question, based upon principles identified during discussions with members of the MetroGIS Policy Board, its Coordinating Committee, and county participants while negotiating interim data sharing agreements.

- ***Forms of Contributions.*** Contributions may be in several forms, including funding, data, people and equipment.
- ***Existing Business Functions.*** Organizations will not be expected to maintain data for MetroGIS unless that organization has an internal business purpose to maintain the data.
- ***Equivalent Effort.*** No organization will be expected to contribute more to support a MetroGIS data need than it would have to pay to meet its internal needs outside of a collaborative environment.
- ***Costs of Data Development.*** Organizations will not be expected to incur costs to develop or maintain data for MetroGIS that exceed what it would cost to meet their own needs without being appropriately compensated.
- ***Costs of Data Distribution.*** Organizations will not be expected to contribute more to a MetroGIS data sharing solution than they would incur to obtain, import, and manipulate data for their own needs unless they are appropriately compensated.
- ***Data Sales.*** Where revenues are derived from sale of data assembled from MetroGIS member data, the proceeds may be considered as contributions to support MetroGIS.

**(2) Establishing Base Costs.** Prior to developing options for allocating the estimated costs, “base costs” will be established for each organization represented on the MetroGIS Policy Board. Base cost is defined as the cost that an organization incurs to obtain, import, and/or manipulate data to support its internal business needs, assuming no data sharing agreements or other collaboration existed. The results will be used to estimate base costs for other organizations within the region.

**(3) Develop Options.** Options to equitably allocate the costs estimated in Task B and to encourage long term participation of data producers will be developed for consideration by the MetroGIS Policy Board. Options will include the following. More than one option may be selected and others may yet be considered.

- ***Data Maintenance Supplement Fee.*** Data consuming organizations would regularly contribute to a pool of funds that would be available to compensate data producers and other organizations incurring special costs to address MetroGIS information needs. The willingness of data producers to make their data available has been demonstrated as a result of the Interim GIS Data and Cost Sharing Agreements between the seven counties and the Metropolitan Council<sup>7</sup>. Each county receives a flat payment each year during the term of the agreement based upon its area and the number of parcels within the county.
- ***Organization Category Subscription Fee.*** Assign a fair-share cost of the annual MetroGIS cost to each major organization type based upon factors to be determined. Major types include counties, cities, school districts, watershed districts, and metropolitan organizations. Organizations within each type would contribute an amount based on the number that participate — the more organizations that participate, the less expense to each.
- ***Individual Organization Subscription Fee.*** Assign a fair-share cost of the total annual data sharing mechanism cost to organization on the basis of factors to be determined.

We propose to test our assumptions and establish guidelines that should have applicability for similar multi-participant undertakings elsewhere. The results of these investigations; advantages and disadvantages of the each option, from the perspective of the MetroGIS Policy Board; and the selected option(s) would be documented.

#### **D. Document Project Results**

Task D will be devoted to fully documenting the work of the MetroGIS NSDI Framework Demonstration Project, focusing not only on the required project reports but also on how these efforts apply to coordinating geospatial data activities of the broader Minnesota community. Areas that require further research would also be identified.

### **3. FRAMEWORK INFORMATION CONTENT**

One of the fundamental premises of our approach to the NSDI framework is that, ultimately, its success depends upon reconciling the interests of contributors and integrators with the high level goals of the NSDI. Benefits must not only be promised by collaboration, but actually realized. Significant work was required before the seven framework elements were chosen as the core of the NSDI. Similar efforts were undertaken for MetroGIS and now guide the information content of its work plan.

It is important to note that the MetroGIS information needs do not correspond directly to the framework elements. However, the process used to arrive at MetroGIS needs produced a strong consensus of the region's priorities. The effort used a highly participatory business modeling process, supplemented by a cross-sectional survey to reach consensus, involving some 150 individuals representing a broad range of organizations, professional interests and responsibilities.

The MetroGIS information needs process identified the following as its highest priorities. They have been adopted by the MetroGIS Policy Board and guide the project's resource allocation and

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<sup>7</sup> See Attachment A for an overview of the Interim GIS Data and Cost Sharing Agreement Initiative.

work plan decisions. Their relationship to framework elements is described below, along with framework outcomes that will be pursued if a grant award is received.

#### **A. Jurisdictional Boundaries/Governmental Units**

Although several Minnesota organizations are involved with boundary reviews, no procedures for systematically recording and updating geospatial data depicting governmental units currently exists. This project will provide an opportunity to build on work already underway and bring together the principal organizations involved with the review process, clearly articulate the region's business needs and devise a prescription for comprehensive boundary management within the region that can serve as a model for Minnesota. An opportunity exists at this time to formulate this prescription so that it supports the NSDI framework specifications. Identification of an appropriate area integrator and their responsibilities is a goal.

#### **B. Parcel Boundaries/Cadastral Features**

Cadastral features have received much attention in Minnesota and parcel data are near the very top priority of a recent Governor's Council on Geographic Information survey as well as a top priority of MetroGIS. Though much of this interest reflects interest in local parcel data rather than the PLSS oriented view characterizing the framework, a substantial investment has been made in developing statewide PLSS data sets and highly accurate parcel boundary databases.

#### **C. Address Locations/Transportation**

MetroGIS participants have identified a pressing need for data that can effectively locate people, places and things based upon a street address. We propose to work on this MetroGIS information need for "addresses of people, places and things" as a component of a region wide addressable street network database. This network corresponds to an important component of the NSDI framework element for transportation.

### **4. TECHNICAL/OPERATIONAL CONTEXT**

Thus far, MetroGIS has demonstrated the willingness of local organizations to work collaboratively over a prolonged period towards common geospatial technology goals, even demonstrated the circumstances under which organizations were willing to forego revenues to make data available. To function as a sustainable NSDI regional integrator, however, MetroGIS must resolve some fundamental technical and operational issues during the next year or so. MetroGIS work teams, comprised of a broadly representative group of managers and technical staff, have begun to address these issues — both at the policy level and, more specifically, for individual data elements. The work supported by this grant will allow MetroGIS to more fully address the technical and operational goals of the framework.

The primary NSDI technical goals — integrate high-resolution, locally produced data; provide geospatial data at varying resolutions for any given location; protecting contributor data holdings as they are integrated with data from other sources — are consistent with the MetroGIS vision at their highest levels of abstraction. Turning these high level goals into practical policy is an important challenge that MetroGIS has chosen to pursue. Since MetroGIS was established as a "stakeholder governed" collaborative, its technical and operational characteristics reflect the needs of its stakeholders. Some of the most important contributions that MetroGIS can make to the NSDI framework derive from clearly identifying the technical and operational conventions that local participants are prepared to support.

Thus far, significant resources have been devoted to devising technical and operational solutions for several MetroGIS needs relevant to the framework.

- Protocols, technical and operational, have been developed for updating orthophotography, with funding from the Metropolitan Council to acquire the photography and to process the images according to framework specifications.
- A MetroGIS committee is developing specifications for jurisdictional boundary data, one of the seven framework elements. Current and accurate jurisdictional boundary data has been identified as the highest priority information need for MetroGIS.
- A public/private agreement has been made on behalf of MetroGIS to provide for development and maintenance of street network files, with improved address ranges designed to more accurately meet the needs of MetroGIS participants. The address data are maintained in accordance with technical guidelines for addresses developed by the MetroGIS Standards Team and approved by the MetroGIS Policy Board.<sup>8</sup>
- A first-generation version of *Data Finder*, developed by MetroGIS to provide internet based data search and retrieval, will be made available shortly. It searches data descriptions that conform to the *Minnesota Guidelines for Geographic Metadata*. The Minnesota guidelines, a substantial subset of the full FGDC metadata profile, have been tested and are fully compatible with searches through the FGDC Clearinghouse gateway in Reston.

Next year's MetroGIS work plan will focus on further clarifying technical and operational issues related to important MetroGIS information needs, including jurisdictional boundaries, transportation networks and their attributes, and parcel boundaries. With help from an FDPP grant, the work will be enhanced to focus on technical and operational issues required to meet NSDI framework goals.

## 5. BUSINESS CONTEXT

The MetroGIS vision statement commits to sharing data “*that are accurate, current, secure, of common benefit, and readily useable.*” These goals mirror the fundamental goals of the NSDI framework. Providing a supportive business context to achieve this vision is a principal challenge for MetroGIS. MetroGIS has devised solutions to some its important business practices, particularly policies about specific standards.<sup>9</sup> More work is planned for the coming year — especially focusing on additional standards, access restrictions, data fees or subscriptions.

Since the MetroGIS work plan reflects the priorities of its collaborating organizations, priorities do not directly reflect those of the NSDI. In some instances, business practices diverge in important ways from those of the NSDI framework. This grant will help support the work needed to address MetroGIS business needs while also focusing attention on issues that must be resolved for MetroGIS to productively contribute to the NSDI framework.

While the MetroGIS data sharing goals are consistent with those of the framework — that data are “*widely used and useful*” — several business characteristics sought by the framework need special attention. In particular, geospatial data assembled by local governments within Minnesota are not generally distributed at no cost and without restrictions. Most counties within the region currently maintain some cost-recovery policy. MetroGIS has created a climate that provides for no-cost distribution of data to public sector participants, but there is only limited support for totally unrestricted and free distribution. Circumstances are not very different within other parts of the

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<sup>8</sup> The addressing guidelines, *Guidelines and Issues for Working with Address Data*, are available at the MetroGIS web site ([www.state.mn.us/intergov/metrogis/pubs.htm](http://www.state.mn.us/intergov/metrogis/pubs.htm)).

<sup>9</sup> Standards have been approved by the MetroGIS Policy Board for metadata and for street addresses. They are described in *Guidelines and Issues for Working with Address Data* and *Minnesota Geographic Metadata Guidelines*, available at the MetroGIS web site [[www.state.mn.us/intergov/metrogis/pubs.htm](http://www.state.mn.us/intergov/metrogis/pubs.htm)].

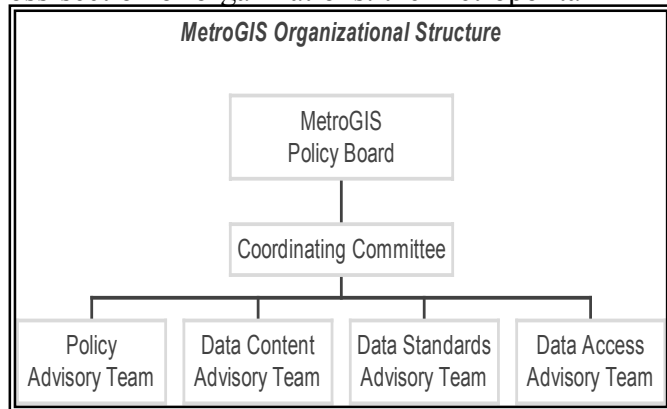
country; only the Federal government is required by law to put data into the public domain. This conflict must be resolved to achieve the framework goals regarding data access and pricing as reflected in Circular A-130 from the U.S. Office of Management and Budget.

The work proposed for this project focuses on these business practices for MetroGIS. The intent, as described in this project’s work plan, is to identify the costs of MetroGIS collaboration — including opportunity costs for lost revenue — and to develop “fair share” allocation strategies for sustainable financing of the collaborative effort. Business practices related to complying with MetroGIS data standards, documenting data in compliance with the *Minnesota Geographic Metadata Guidelines*, making data available in formats not normally maintained by data producers, and abandoning cost-recovery policies will all be addressed. If tangible progress towards the NSDI framework goals is to be made by efforts such as MetroGIS, such issues must be addressed and documented. This project, if funded, will undertake that task.

## 6. INSITUATIONAL AND ORGANIZATIONAL PROCESS

MetroGIS may be the most ambitious multi-participant GIS venture in the country with over 420 units of local government represented by its partner organizations. Conceived in late 1995, it reflects significant commitments of a broad cross-section of organizations: the Metropolitan

Council, city councils, county boards, school districts, watershed organizations, state and federal agencies, the academic and non-profit communities, and the private sector. Legislative bodies and policy boards of key organizations have adopted resolutions supporting MetroGIS principles and members from organizations critical to the success of MetroGIS serve on the MetroGIS Policy Board<sup>10</sup>. The Policy Board is advised by a Coordinating



Committee comprised of more than twenty GIS professionals and managers representing participating organizations, while dozens of other GIS professionals serve on MetroGIS teams devoted to Data Content, Data Standards, Data Access and Policy Issues.

Detailed by-laws and operating procedures guide MetroGIS.<sup>11</sup> Adopted by the Policy Board, they provide a basic structure for governance that corresponds to the organizational chart shown in this proposal. Administrative support is provided by the Metropolitan Council, taking direction from the Policy Board and its committees. The Policy Board and Coordinating Committee meet bi-monthly, in alternate months. Advisory Teams and their various work groups meet as needed to complete their work, which is generally assigned by the Coordinating Committee. The teams report back to the Coordinating Committee, which recommends actions to the Policy Board when they are needed. Following this process, the Board has approved recommendations for the three high priority information needs addressed by this project. The Policy Board also has approved standards for metadata and address formats.

Although the current geographic scope of MetroGIS is the seven county region served by the Metropolitan Council, the by-laws and procedures adopted by the Policy Board provide for

<sup>10</sup> Refer to Attachment B for a listing of the MetroGIS Policy Board members.

<sup>11</sup> An overview of the provisions contained in the detailed operating guidelines is provided at the MetroGIS web site. The address is <http://www.state.mn.us/intergov/metrogis>.

extending the effort beyond those boundaries. Since the Metropolitan Council serves only the core counties of a much larger Minneapolis-St. Paul Metropolitan region recognized by the U.S. Census Bureau, including three counties in Wisconsin, the organizational framework and the technical protocols for integrating data adopted for MetroGIS must be capable of extension.

MetroGIS participants have worked hard to reach consensus about their collective priorities. The Business Information Needs Project has been especially important. This multi-purpose, consensus-based process was devised to: 1) identify data needed to answer high priority information needs of key stakeholders, 2) identify data custodians and their responsibilities, and 3) define critical standards, integration and aggregation specifications, and institutional policies necessary for MetroGIS participants to share commonly needed data. Reaching consensus about the long-term organization and financial structure for MetroGIS is the highest current priority for the Policy Board.

Early financing for MetroGIS has been provided by the Metropolitan Council, but the broader financial commitments needed to sustain this effort are now being studied by the Policy Board. To support MetroGIS, the Council added two staff members — GIS Liaison and Assistant GIS Liaison — whose job responsibilities include outreach and promotion of collaborative approaches to development and maintenance of a regional GIS. A MetroGIS web site (<http://metrogis.org>) is funded by the Council to keep constituents informed of MetroGIS activities.

This project proposes to expand the MetroGIS Business Information Needs Project process to address the seven NSDI framework functions for each of the MetroGIS priority information needs. Resolving issues of horizontal and vertical integration, quality assessment, and management of data needed to carry out the business functions of MetroGIS stakeholder organizations are fundamental to the principles upon which MetroGIS is founded.

## **7. PROJECT PARTICIPANTS AND EXPERIENCE**

Principal responsibility for this project will be assumed by the Metropolitan Council on behalf of the MetroGIS Policy Board, which has endorsed the project. In addition to the primary staff described below, staff from a number of participating organizations serve on the Coordinating Committee and its Advisory Teams. Descriptions of the principal project participants follow.

#### **A. Randall Johnson, Metropolitan Council, Project Director**

Randy Johnson is Regional GIS Liaison for the Metropolitan Council, where he has had a principal role in defining and implementing MetroGIS. Previously, he coordinated community development activities for the City of Shoreview, successfully promoting a coordinated GIS effort for Ramsey County. Randy participated in the Denver, Baltimore, Seattle, and Annapolis NSDI framework work sessions. He coordinates staff support for MetroGIS and efforts to secure political support, participation, and agreements among MetroGIS stakeholders. He holds a master's degree in planning and urban policy development. Randy will provide project coordination and oversight, including aligning strategies with NSDI requirements and will assist with each of the Tasks.

#### **B. David Arbeit, Land Management Information Center**

David Arbeit is Director of LMIC, managing a staff of more than 20 GIS professionals dedicated to providing geographic information services to the Minnesota geospatial data community. With a budget of more than \$1.5 million, LMIC provides a range of services, including support for the Governor's Council on Geographic Information. David holds master's and doctorate degrees in planning from Cornell University and has worked with geospatial information technologies as an educator, researcher, and practitioner. Dr. Arbeit served on the Board of Directors for URISA between 1990 through 1992. He is an ex-officio member of the Governor's Council on Geographic Information and Chair of the Coordinating Committee of the MetroGIS project. David will assist with each of the Tasks as a member of the MetroGIS Coordinating Committee and Policy Advisory Team. He will also work on Tasks C and D.

#### **C. Rick Gelbmann, Metropolitan Council.**

Rick Gelbmann is GIS Coordinator for the Metropolitan Council, where he has had a founding role in conceptualizing and gaining support for MetroGIS. His 15 years of GIS experience includes more than 10 years of project management. Prior to joining the Metropolitan Council, he was GIS Project Manager for the Minnesota Department of Natural Resources, Division of Waters. Rick is an active member of the Governor's Council on Geographic Information Data Standards Committee. Rick conceptualized MetroGIS *Data Finder* and managed the consultant contract to develop the prototype. He will be involved in all phases of this project, either directly or as supervisor to Metropolitan Council GIS Specialist staff.

#### **D. Project Specialists**

**Mark Kotz** is a GIS Specialist for the Metropolitan Council, where he supports work related to standards, metadata, and integration of parcel data. Mark previously worked for the Minnesota Department of Natural Resources Land Management Division, developing methods to improve cadastral data for publicly owned lands. Mark is a key member of the Governor's Council on Geographic Information Data Standards Committee, where he has led an effort to develop a workable Minnesota framework for metadata based on the FGDC standard. In addition, Mark co-chairs the Parcel Data Committee of the Governors Council, which works on issues concerning the development of cadastral data in Minnesota. He also provides staff support for the MetroGIS projects. Mark will assist with Tasks A and B.

**David Vessel** is a GIS Specialist for the Metropolitan Council, where he supports work related to soils, transportation, and environmental modeling. David previously worked for the Minnesota Land Management Information Center, where he worked on the Ground Water and Surface Water Information Systems projects and provided staff support for the Governor's Council on Geographic Information. David is a member of the Governor's Council on

Geographic Information Soils Committee and is the staff liaison to the MetroGIS Data Content Advisory Team. He will assist with Tasks A and B.

**Tanya Mayer** is a GIS Specialist for the Metropolitan Council, supporting work related to aerial photography, digital imagery and digital orthophotography and MetroGIS *Data Finder*. Tanya previously was Director of the GIS Office for the Minnesota Legislature, developing applications for the state redistricting effort and providing legislators with geographic information for decision making. She is a past member of the Minnesota GIS/LIS Board of Directors, a member of several committees of the Minnesota Governor's Council on Geographic Information and provides staff support for MetroGIS. She will assist with Tasks A and B.

**Chris Cialek** is in charge of Data Services at the Land Management Information Center. He previously worked with geospatial technology at the New York State Department of Transportation and the USGS National Mapping Division. Chris holds a masters degree in geography from Michigan State University and did post-graduate work in GIS at the State University of New York at Buffalo. He serves as the Minnesota representative on the National States Geographic Information Council and as the LMIC representative on the Minnesota Governor's Council on Geographic Information. He chairs the GI Council's Standards Committee and is a member of the MetroGIS Standards Committee. He will assist with Task A.

## 8. COMMITMENT TO EFFORT

The Metropolitan Council will act as project fiscal agent on behalf of the MetroGIS Policy Board. The Minnesota Land Management Information Center, which supports the work of the Minnesota Governor's Council on Geographic Information, also will participate in the project.

The Metropolitan Council, LMIC and the GCGI have been working to assess data needs, develop standards for data and metadata, and formulate agreements and mechanisms for data access and distribution within the region and the state. Moreover, each has supported NSDI goals by collaborating with the FGDC on technical reviews, sponsoring local workshops, and participating in national working groups and committees.

The applicant and the project's principal cooperators have made fundamental commitments to developing and sustaining the capacity to provide geospatial data to users within Minnesota, for local use, for regional use, and for statewide use. Project participants are strongly committed to this project and ongoing efforts to develop solutions to integrating geospatial data from locally derived sources.

The commitment of the Metropolitan Council, LMIC and numerous other organizations to the basic principles of the NSDI — cooperative data development, data and metadata standards, data access and distribution — are evident in some of the MetroGIS efforts described in this proposal. We have only scratched the surface. The commitment to this project is also reflected by a conservative estimate of more than \$125,000 in matching funds, both hard funds and in-kind contributions, being devoted to this project.

Through 1997, the Metropolitan Council had contributed \$1.21 million to create MetroGIS. The Council has approved \$425,500 for the 1998 MetroGIS program and management will seek \$375,000 for the 1999 program. Activities proposed for 1999 and 2000 include continued support for the MetroGIS Policy Board and advisory committees, identification of data sources and custodians for priority information needs, enhancements to *Data Finder*, development of regional datasets, and development and posting of searchable metadata. Planned work also includes developing a sustainable model for financing and governing MetroGIS.

Revenue sources have not yet been secured to cover all of the costs for the MetroGIS work program. The Metropolitan Council funding is substantial, but this is an ambitious work plan. If the work proposed for 1999 and 2000 can be completed, long term support for sustaining the data sharing behavior established by the Interim GIS Data and Cost Sharing Agreements is achievable. If this work is not completed, the window of opportunity created by the agreements may have expired.

Letters and Memoranda of Understanding endorsing participation in this project by the principal contributing organizations are included as attachments.

## ATTACHMENT A

### Summary of MetroGIS Strategic Initiatives

Significant progress has been made towards achieving the MetroGIS vision, based in part on an extensive business modeling and information needs identification process. The following are among the strategically important accomplishments thus far.

***Interim GIS Data and Cost Sharing Agreements Executed:*** Six interim agreements were executed between September 1996 and December 1997 and an agreement-in-principle has been reached with the seventh county. The seventh agreement is expected to be executed by April 1998. These agreements create the environment needed to test technical and institutional solutions to data sharing obstacles. Logs of the data shared are also required to be maintained and will be used to evaluate the benefits of data sharing.

Each of the agreements generally has a three-year term and is intended to be superseded by agreements with the MetroGIS Policy Board. Each of the Counties has or will receive funds ranging from \$49,500 to \$160,700 for GIS program and data enhancements that have significance to defining and implementing components of a regional data sharing mechanism. In exchange for these funds, each of the Counties has agreed to share their geospatial data with all government organizations during the term of the agreement, facilitate the creation of a GIS Users Forum for local government within their respective boundaries, actively participate in these forums and in the MetroGIS decision making process to address GIS issues and opportunities of common interest.

***Common Business Information Needs Identified:*** Thirteen high priority business information needs<sup>12</sup> have been identified. A consensus-based process<sup>13</sup> has been created through which data needed to answer each priority information need are specified and candidate custodians for these data and their responsibilities are identified. The seven NSDI Framework Functions, as outlined in the Framework Handbook published January 1998, are guiding these discussions.

An Information Needs Forum and Business Object Modeling Sessions held Fall 1996 were the initial events for the project. In the near future, we plan to provide a summary on the MetroGIS WEB site of the survey methodology used to narrow the field of mutually exclusive information needs from 87 to the top 13. David Arbeit, Director of the Minnesota Land Management Information Center (LMIC), and Will Craig, Associate Director of the Center for Urban and Regional Affairs at the University of Minnesota, designed this methodology.

Work on the top information need – jurisdictional boundaries – has resulted in the adoption of data specifications for city, township, and county jurisdictional boundaries and acceptance by the Metropolitan Council to develop a regional coverage as an interim solution until a permanent custodian is agreed upon. Preliminary work has been initiated on data specifications for school and watershed district jurisdictional boundaries and to answer the second priority need -- addresses for people, places, and things.

***Data Search and Retrieval Tools Developed:*** Core functionality for a MetroGIS data search and retrieval tool called *Data Finder* will be operational by April 1998. *Data Finder* is World Wide Web tool designed to search and retrieve metadata and hyperlink to the data locations for retrieval. Initial emphasis will be on populating *Data Finder* with metadata that currently exists. From there, the emphasis will be on developing and posting metadata for the data needed to address the high priority information needs and for other data that organizations wish to share.

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<sup>1</sup> More than 120 persons representing governments, private and non-profit sector interests and academia serving the metropolitan area were asked: *what information do you need to do your job?* More than 800 individual responses were received, which were consolidated to 87 mutually exclusive categories. A similar group was surveyed to rank the 87 needs on the basis of importance to the respondent's organization and the dependence on other organizations for data. On May 28, 1997, the MetroGIS Policy Board endorsed 13 of the 87 as priorities. These are listed in Attachment D.

<sup>13</sup> A schematic of the components of this consensus-based process is presented in Attachment E.

## ATTACHMENT B

### *MetroGIS* *Policy Board Members*

	<u>Name</u>		<u>Organization</u>
Commissioner	Dennis	Berg	Anoka County <b>(Vice Chairperson)</b>
Board Member	Conrad	Fiskness	Metro Chapter of MN Association of Watershed Districts
Council Member	Lisa	Goodman	Association of Metropolitan Municipalities (AMM)
Board Member	Thomas	Halvorson	Technology Information Educational Services (TIES)
Commissioner	Dennis	Hegberg	Washington County
Commissioner	Randy	Johnson	Hennepin County
Commissioner	Edwin	Mackie	Scott County
Commissioner	Don	Maher	Dakota County
Commissioner	Victoria	Reinhardt	Ramsey County <b>(Chairperson)</b>
Council Member	Terry	Schneider	Association of Metropolitan Municipalities (AMM)
Council Member	Bill	Schreiber	Metropolitan Council
Commissioner	John	Siegfried	Carver County

## ATTACHMENT C

### Excerpt

#### Anoka County Interim GIS Data and Cost Sharing Agreement

**3.03 MetroGIS Facilitation Activities.** In exchange for the financial and technical assistance provided by the Council under paragraphs 3.01 and 3.02, the County agrees to perform the following specific activities to help develop regional GIS capabilities and the proposed MetroGIS:

- (a) Participate in MetroGIS Decision Making. The County, through its representatives to the MetroGIS Policy Board and Coordinating Committee, and any other teams or committees, as appropriate, will actively participate in the MetroGIS decision making process.
- (b) Share Geographically-Referenced Electronic Data. During the term of this agreement, the County will make available to the Council and other governmental units with jurisdiction outside Anoka County, the geographically referenced electronic data identified in Appendix A (listing of graphic and digital imagery) and Appendix B (nongraphic data), hereafter referred to as “the County’s geographically referenced electronic data”, according to the following conditions.
  - (1) If the geographically referenced electronic data requested by the Council or other governmental units are accessed via the Internet, an intranet, or other networking technology, the County shall not charge cost recovery fees for access to the County’s geographically-referenced electronic data.
  - (2) If the Council or another governmental unit requests access to the County’s geographically referenced electronic data through a medium other than the Internet, an intranet, or other networking technology, the County shall be free to charge according to its standard pricing policy for the media and data file reproduction costs to deliver its geographically referenced electronic data. This fee shall not include reimbursement for the cost of developing this data.
  - (3) The County shall be free to charge according to its standard pricing policy for data or services provided to organizations or persons not covered by this agreement and for data manipulation or data summary services provided to organizations that are covered by this agreement.
  - (4) Access to the County’s geographically referenced electronic data by local governmental units located within the County shall be governed by current County policy or any separate agreements that may exist between the County and the local government unit(s) as determined by the County.

To the extent practical, the County will also make available to the Council and other governmental units any future data sets it may develop that are identified through the MetroGIS initiative as having cross-jurisdictional [*regional*] significance. All data subject to

this provision shall be kept current, to the extent practical, according to standards to be defined via the MetroGIS initiative. This provision does not obligate the County to establish any new data sets. This requirement to share data, at no cost, with other governmental units that have jurisdiction outside Anoka County is not intended to supersede or impair any existing data access or data sharing agreement to which the County may be a party and applies only to public information.

(c) GIS Users Group. The County will facilitate the creation of and actively participate in a GIS users group consisting initially of the officials from the county and municipalities that serve the county. The membership shall be expanded during the term of this agreement to include representatives from other types of governmental units and organizations, as determined by the study identified in Paragraph 3.01(a)(4). The GIS users group will provide a forum through which its members can regularly discuss cross-jurisdictional GIS opportunities and needs, and collectively address GIS problems and issues.

(d) Supersede Existing Fee Policy. This agreement supersedes any existing County policy regarding fees, in particular fees based upon recovery of data development costs, pertaining to the provision of geographically referenced data to governmental organizations that have jurisdiction outside of Anoka County and that serve the seven county metropolitan area. This stipulation is for the purpose of evaluating institutional and technical obstacles to data sharing that need to be overcome to implement the MetroGIS. This agreement, likewise, supersedes data development cost recovery and fee policies of the Council that may be inconsistent with the provisions of this agreement.

## ATTACHMENT D

### Top Thirteen MetroGIS Information Needs

May 1997

**Rank: Information Need Statement (I need to know...)**

- 1....the boundaries and characteristics of a specified jurisdiction (*ex: city, school district, county, polices and fire districts*). **(Jurisdictional boundaries)**
- 2....the street addresses for specified locations. **(Street addresses)**
- 3....about land use or development plans that have been officially adopted by public bodies. **(Land use plans)**
- 4... who has rights to a property, including ownership, leases, easements, right-of-way. **(Rights to property)**
- 5... the boundaries and location of a specified parcel. **(Parcel boundaries)**
- 6... the locations and characteristics of water features (*ex: lakes, wetlands, floodplains, aquifers, watersheds*). **(Lakes, wetlands, etc.)**
- 7....how a piece of land is being used, including whether or not it is vacant. **(Land use, existing)**
- 8... the boundaries and characteristics of census areas (*ex: census blocks, block groups, and tracts*). **(Census boundaries)**
- 9... where people live and how to contact them. **(Where people)**
- 10..the regulations that affect the use of a piece of land, such as zoning. **(Land Regulations)**
- 11..the locations and characteristics of roads/highways. **(Highway / road networks)**
- 12..the socioeconomic characteristics of an area's population (*ex: census tract, county, city*). **(Socioeconomic characteristics of areas)**
- 13..a unique identifying attribute of a land parcel, such as parcel ID. **(Parcel identifiers)**

## **ATTACHMENT E**

### **--- Consensus-Based Process --- Data Specifications, Candidate Custodian Organizations and Custodian Responsibilities**

(see [http://www.metrogis.org/data/about/info\\_needs\\_process\\_diagram.pdf](http://www.metrogis.org/data/about/info_needs_process_diagram.pdf))



**ATTACHMENT F**

**MetroGIS Data-Related Responsibilities**  
***Regional MCD & County Jurisdictional Boundaries Dataset***

This table describes how MetroGIS responsibilities for county and MCD (minor civil division) regional jurisdictional boundaries dataset align with the NSDI framework functional components. A similar matrix will be prepared for each the other regional data themes of significance to MetroGIS. An analysis of how local needs diverge and converge from the NSDI guidelines will be undertaken for the top three information needs as part of the MetroGIS Framework Demonstration Project. The costs associated with maintaining the MetroGIS data sharing mechanism are to be defined on the basis of these responsibilities.

NSDI Framework Components	Tasks Involved	MetroGIS Policy Board	MetroGIS Coordinating Committee/ Advisory Teams	Custodian (Regional Dataset)	Custodian (Primary Data Source)
Executive Guidance	-developing a shared vision among stakeholders -developing a strategic plan for the enterprise -establishing organizational structures, operational environments, orderly communications, decision making, and other governance processes -developing and maintaining policy and funding support for the effort among senior executives and other influential parties -providing a legal foundation for contracts, liability, other issues.	⊙			
Coordination	-fostering cooperation and partnerships among organizations -implementing processes and incentives that encourage widespread participation -encouraging practices that provide for smooth operations -mediating and resolving conflicting priorities and disputes among participants		⊙		
Data Access	-providing access to data and metadata -processing data requests and charges -determining and providing needed data distribution formats -reporting and acting on users' concerns		-Access Team -Coordinating Committee	Metropolitan Council	
Data Development, Maintenance & Integration	-generating original data and revisions -merging <i>and coordinating</i> spatial and attribute data from different sources -documenting the data -evaluating and integrating the data			-Metropolitan Council to compile a regional coverage	Each of the 7 counties will be responsible for coverage within their county.
Data Management	-maintaining data -ensuring data integrity and security -developing and evolving data definitions, designs, and models -developing and evolving other technical specifications -providing for data archive, backup, retrieval, and disaster recovery		-Standards Team -Data Content Team	-Metropolitan Council maintains and re-compiles the regional dataset	-counties maintain primary data sources.
Monitoring and Response	-measure users' satisfaction with the framework / MetroGIS -providing for market analysis		⊙		
Resource Management	-estimating income and expenses -identifying, obtaining, and allocating resources; - providing logistical support for framework development	⊙	⊙		