***MetroGIS** - Cooperation, Coordination, Sharing Geographic Data*

June 4, 1999

Congressman Stephen Horn, Chairman
Subcommittee on Government Management, Information, and Technology
U.S. House of Representatives
Washington D.C. 20515

Oversight Hearing on Policies and Programs of Geographic Information Systems
June 9, 1999

Dear Congressman Horn:

On behalf of the entire MetroGIS organization, we are honored to have been selected to testify before your subcommittee as a representative of locally focused, regionally coordinated GIS initiatives. We are equally honored to have the opportunity to offer suggestions about how the federal government would be a resource to help regional GIS collaboratives overcome challenges and meet local objectives.

I chair the MetroGIS Policy Board. The Board is comprised of twelve locally elected or appointed officials who represent eleven categories of local and metropolitan government which serve the seven-county Twin City Metropolitan Area. Each member is committed to institutionalizing widespread data sharing among our stakeholder organizations. MetroGIS, like the National Spatial Data Infrastructure (NSDI) project, is founded on the principle that data sharing and collaboration are in the public interest. MetroGIS' philosophy appears to differ slightly from that of NSDI in that we are attempting to address stakeholder perceptions of the degree of benefit received rather than assume benefit is received.

MetroGIS is a work in progress, an ad hoc organization not yet able to operate independently. Even so, I believe the guiding principles we rely upon as we undertake each of our strategic initiatives will permit us to evolve into a sustainable entity. I also believe the work of MetroGIS will have a profound affect on information and data sharing policy as well as substantially increase collaborative data development and data sharing activity in the Twin Cities, possibly the State of Minnesota. The single most important reason for MetroGIS' success to date, I believe, is we took a substantial amount of time early on to understand commonalties among the business information needs of our key stakeholder organizations. We have also remained focused on our ultimate goal to improve efficiency and effectiveness of our stakeholders in their pursuits to improve quality of life and economic competitiveness.

Again, on behalf of MetroGIS, and with great pleasure I submit the attached written testimony. I also am looking forward to appearing before your subcommittee to discuss goals and issues we have in common.
Respectfully,

Victoria Reinhardt, Chairperson
MetroGIS Policy Board and
Ramsey County Commissioner

Cc: The Honorable Bruce Vento, The Honorable Jim Ramsted, The Honorable Martin Sabo, The Honorable Bill Luther, Metropolitan Council MetroGIS Policy Board

***MetroGIS** - Cooperation, Coordination, Sharing Geographic Data*

June 4, 1999

Congressman Stephen Horn, Chairman
Subcommittee on Government Management, Information, and Technology
U.S. House of Representatives
Washington D.C. 20515

Oversight Hearing on Policies and Programs of Geographic Information Systems – June 9th

Dear Congressman Horn:

I am writing on behalf of the Metropolitan Council of the Greater Minneapolis-St. Paul Metropolitan Area. I wish to thank you for your recognition of MetroGIS' philosophies and accomplishments as an example of a successful, locally focused, regionally coordinated GIS initiative and for your invitation to MetroGIS to testify before your subcommittee on June 9th.

The Metropolitan Council is the regional planning organization for the seven-county Minneapolis-St. Paul Metropolitan Area. I serve as the Metropolitan Council's chairperson and together with sixteen colleagues, each of us appointed by the Governor of Minnesota, we provide policy direction for the organization. The Council's responsibilities include running the regional bus system, collecting and treating wastewater and managing water resources preservation, overseeing growth management policy, planning regional parks and administering funds that provide housing opportunities for low and moderate income families[1].

In 1994, the Metropolitan Council concluded it needed a parcel-based GIS to support its business operations. We also concluded that a collaborative approach with our local government partners, in particular with the seven counties, was the most prudent course of action. Championing of this initiative was also consistent with the Council's over-arching goals to foster collaborative solutions to needs in common with other government entities that serve our seven-county region and with the Council's desire to be recognized as an effective leader in the region.

Since the fall of 1995, the Council has been the sole source of local funding for what has become to be known as the MetroGIS initiative[2]. These resources include in excess of $1.2 million for MetroGIS' various studies and projects, providing two full time staff dedicated solely to the initiative, and making available the equivalent of an additional two staff positions for special projects and administrative support.

MetroGIS is a work-in-progress governed by its key stakeholders, the Metropolitan Council being one of eleven. Grant funding received from the federal NSDI Framework Demonstration Project has made it possible for MetroGIS to embark on its final definitional challenges – developing of a fair-share cost allocation scheme and identifying an appropriate organizational structure – without impeding progress on other strategic projects underway.

Again, on behalf of the Metropolitan Council, thank you for your interest in learning more about the Twin Cities' MetroGIS initiative. If the MetroGIS experiment is successful, and there is no reason at the present time to believe otherwise, the Council and its partners expect to be able to more efficiently and effectively address issues of quality of life and economic competitiveness and to minimize time consuming costly debates over inconsistencies in data from one jurisdictional entity to another.

Good luck with your hearing.

Respectfully,

Ted Mondale, Chair
Metropolitan Council

SUBCOMMITTEE ON
GOVERNMENT MANAGEMENT, INFORMATION AND

of the
COMMITTEE ON GOVERNMENT REFORM AND OVERSIGHT
U.S. HOUSE OF REPRESENTATIVE

Oversight Hearing on Geographic Information Systems
Policies and Practices
June 9, 1999

Statement from
MetroGIS
A Regional GIS Collaborative Serving the
Seven-County Minneapolis-St. Paul Metropolitan Area

Presented by
Victoria Reinhardt
Chairperson, MetroGIS Policy Board and
Commissioner, Ramsey County, Minnesota

ACKNOWLEDGEMENTS

Principal Contributors: David Arbeit, Director of the Minnesota Land Management Information Center (LMIC) and member of the MetroGIS Coordinating Committee and Randall Johnson, MetroGIS Staff Coordinator, Metropolitan Council.

Other Contributors: Rick Gelbmann, Metropolitan Council GIS Supervisor and member of the MetroGIS Coordinating Committee; Jeanne Landkamer, communications consultant to MetroGIS, Trudy Richter, Richardson and Richter & Associates, Inc., member of consultant for MetroGIS Fair-Share Financial and Organization Structure Project; and Craig Skone, GIS Technician, Metropolitan Council; and Melissa Walker, GIS Administrative Assistance, Metropolitan Council.

For information about this report, please contact:
Randall Johnson, AICP
MetroGIS Staff Coordinator
651-602-1638
randy.johnson@metc.state.mn.us

TABLE OF CONTENTS

The Twin Cities MetroGIS Project and Its Significance to the NSDI

Introduction

Organizations within the Minneapolis-St. Paul metropolitan region have been working together since 1995 to build a sustainable structure for effectively meeting their common geospatial data needs. This effort, called MetroGIS, reflects Minnesota's historical tradition of practical collaborative development and implementation of geospatial information technology. Involving a comprehensive cross-section of public and private organizations doing business within the seven-county metropolitan planning region, MetroGIS evokes an unprecedented level of commitment from its stakeholders to a shared vision. This paper describes that vision, documents some of the progress that has been made towards achieving it, identifies some important challenges facing MetroGIS and the National Spatial Data Infrastructure, and offers some ideas about federal roles in fostering regional GIS collaboratives such as MetroGIS.

MetroGIS: Reflecting Minnesota's Cooperative Spirit

MetroGIS1 may be the most ambitious multi-participant GIS venture in the country with over 250 units of local government represented by its stakeholder organizations. Conceived in late 1995, it reflects significant commitments of a broad cross-section of organizations: the Metropolitan Council of the Greater Minneapolis-St. Paul Metropolitan Area (Metropolitan Council)[2]; other metropolitan agencies, such as the Metropolitan Airports Commission and the Metropolitan Mosquito Control District; city councils; county boards; school districts; watershed organizations; state and federal agencies; the academic and non-profit communities; and the private sector.

Organizational Structure. The organizational structure for MetroGIS reflects the strong commitment that has been made. 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[3]. 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 and special purpose workgroups devoted to identifying workable solutions to data access, data content, data standards, and policy needs critical to achieving the vision of MetroGIS.

Detailed by-laws and operating procedures guide MetroGIS. Adopted by the Policy Board, they provide a basic structure for governance. The Metropolitan Council provides administrative support and most of the funding at the present time. The Policy Board and Coordinating Committee meet quarterly. Advisory Teams and their various work groups meet as needed to complete their work, which is

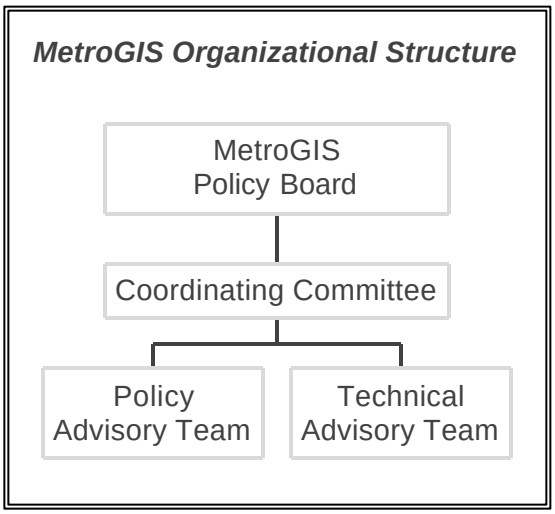
1 See the MetroGIS Internet site at www.metrogis.org for additional information about the participants, projects, and operating guidelines.

2 The Metropolitan Council is the regional planning organization for the seven-county Minneapolis-St. Paul Metropolitan Area. Its responsibilities include running the regional bus system, collecting and treating wastewater and managing water resources preservation, overseeing growth management policy, planning regional parks and administering funds that provide housing opportunities for low and moderate income families. See www.metrocouncil.org for more information.

3 Refer to Appendix A for a listing of the MetroGIS Policy Board members and their affiliations.

generally assigned by the Coordinating Committee. The teams report back to the Coordinating Committee, which recommends actions to the Policy Board.

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 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 by MetroGIS must be capable of expansion.

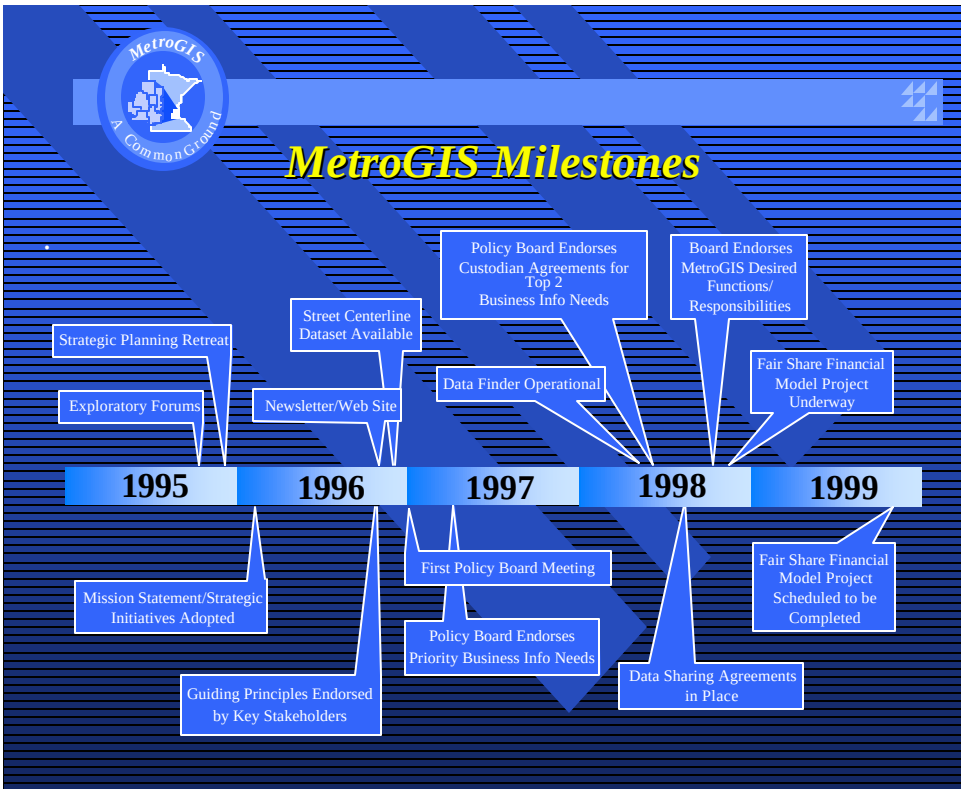


Vision and Accomplishments. A seemingly simple vision guides MetroGIS, forged through an intensive consensus-building process4 and endorsed by all local government organizations critical to its success. The vision:

> *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.*

MetroGIS has made significant progress towards fulfilling its vision, thanks to substantial financial and resource commitments made by the Metropolitan Council, several hundred volunteers representing dozens of cooperating organizations, and grant funding received from the National Spatial Data Infrastructure (NSDI) program. A timeline of significant MetroGIS accomplishments is provided on the following page, supplemented by brief descriptions in Appendix B.

4 In December 1995, the Metropolitan Council hosted a strategic planning retreat to begin discussion on how to proceed with creation of a regional GIS collaborative to serve the seven county Minneapolis St. Paul Metropolitan Area. Twenty invited management representatives of public and private organizations, which serve the metro area, attended. Michael Domaratz, ~~of the~~ FGDC staff, also participated. The majority of the participants agreed to continue to serve as a Coordinating Committee for the initiative. Dr. John Bryson and Charles Finn, ~~with the~~ University of Minnesota, Humphrey Institute for Public Affairs, facilitated the retreat. Dr. Bryson is a recognized expert on strategic planning and public policy development.



Nonetheless, MetroGIS is a work-in-progress, an ad hoc organization not yet able to operate independently. The current schedule calls for the MetroGIS Policy Board to decide on October 27, 1999 whether to seek legal standing for MetroGIS as an independent entity. The Board also will be asked to act on the final components of the MetroGIS definitional phase: adopting an approach for equitably sharing MetroGIS operating costs.

MetroGIS: the State and National Context

MetroGIS shares a similar vision with visions adopted by the Minnesota Governor's Council on Geographic Information and promoted for the NSDI. Each assumes that geographic data have significant value and that coordination among data producers can significantly enhance that value while reducing the costs of data development and use. Each also envisions making data available for use at minimal cost to users. Further, MetroGIS5 and the state of Minnesota6 have both actively contributed

5 MetroGIS staff has ~~been invited to~~ participated in a number of FGDC meetings concerning the NSDI and FGDC staff has shown great interest in MetroGIS as a model for other regional GIS collaborative projects. MetroGIS has received an NSDI Framework Demonstration grant to identify and assess some of the organizational issues of sustainable regional geodata collaboration.

6 The Minnesota Governor's Council on Geographic Information is recognized by the FGDC as an NSDI cooperating state organization. Its member organizations have contributed to creating, reviewing and promoting standards for data and data documentation, helped guide creation of a Minnesota Geospatial Data Clearinghouse node, and coordinated other NSDI activities within Minnesota.

to refining and advancing the NSDI vision. Based on these circumstances, it is tempting to conclude that the NSDI vision is a practical goal and that, at least within Minnesota, the pieces will easily and are rapidly fall into place.

But similar visions do not guarantee easy synchronization between MetroGIS, the state of Minnesota, and the NSDI. As a regional organization, the geodata needs for MetroGIS cannot be assumed to be identical to state of Minnesota needs or to the needs of federal agencies. Even within single units of government, geodata needs are often complex. A municipal public works department may legitimately view its data needs differently from the same city's planning department; diverging data needs also are common among county departments, state agencies, or federal units of government. Assuming that locally generated data can be meaningfully pieced together to form coherent regional, state or national data collections requires a huge leap of faith. Simply stated: one size does not fit all!

The NSDI vision[7] assumes that any organization may contribute to the NSDI framework by integrating data for a geographic area contributed by local governments, state and federal agencies, the private sector and other organizations. Such organizations, called *data integrators*, would format the data to agreed upon standard specifications. In local areas, organizations would work together to create large-scale data. These data would be aggregated by data integrating organizations needing more generalized data for larger areas. This would be a plausible scenario if the geodata needs of all organizations within an area were identical and the costs of integration were trivial. But the reality is quite different — organizations have different data needs and the costs of integration are real! The vision requires willing data contributors and willing data integrators. Therein lies a key question: why would organizations choose to assume those roles?

MetroGIS makes a practical assumption that organizations cooperate out of self-interest. Very early, participants agreed that they would be asked to support the "data sharing" ideal only if it met their own business needs. In other words, MetroGIS must serve a diverse collection of functional ends, not data sharing for its own sake. For MetroGIS, the principal stakeholders are the Metropolitan Council and local units of government — counties, cities, school districts, and watershed districts — few of which need geodata for the same purpose or use it in the same form. The principal challenge for MetroGIS is to meet the geodata needs of these organizations without costing them more in resources or time than would otherwise be the case if they developed or integrated the data themselves.

To succeed, MetroGIS must clearly identify benefits to stakeholders to justify the resources they will be asked to commit to collaboration. Costs are a significant issue. In some cases, the data-sharing goal threatens stakeholder revenue streams — sometimes real; sometimes imagined. This issue, too, must be addressed fairly and practically. The answers will be important to MetroGIS and to the NSDI.

Based on this "self-interest" assumption, MetroGIS is guided by several fundamental principles, including the following.

1. **Actively Involve Policy Makers**. The MetroGIS Policy Board was created to include high level representation of key stakeholders and to keep MetroGIS focused on stakeholder needs. The Board has set the direction for strategic initiatives, provided a reality check for proposed courses of action, identified appropriate areas for collaboration and, of course, set policy.

7 Federal Geographic Data Committee. 1997. *Framework: Introduction and Guide*. Federal Geographic Data Committee. Washington, D.C.

2. **Promote Understanding**. To help Policy Board members understand the value of geodata and GIS, Policy Board meetings include demonstrations by organizations represented on the Board using GIS to support their business operations and to point out benefits associated with data sharing.8
3. **Seek Consensus on Policy Decisions.** Consensus among Policy Board members is sought for courses of action on issues and opportunities fundamental to MetroGIS.
4. **Represent Diverse Perspectives**. MetroGIS decision making derives from work performed by broadly representative committees and workgroups, comprised of managers and technical staff with appropriate expertise, which identify common needs, develop work programs, and formulate solutions to these needs.
5. **Maintain Focus on Business Information Needs**. MetroGIS took pains to identify common business information needs of key stakeholder organizations and embarked on a regional geodata strategy consistent with these common needs.
6. **Focus on Stakeholder Benefits.** Identifying stakeholder benefits is fundamental to strengthening commitments to MetroGIS, whether or not benefits can be precisely measured. Identify and communicate the benefits.
7. **Acknowledge Fair-Share Contributions**. Contributions to the sustained operation of the regional collaborative, from any one stakeholder, may be in the form of funding, data, and/or people and equipment.
8. **Compensate for "Costs of Collaboration."** No stakeholder organization will be asked to perform a function for the collaborative, which exceeds their internal business needs, without appropriate compensation.

The Metropolitan Council as Project Champion

The Metropolitan Council is a metropolitan government organization charged by the Minnesota State Legislature to provide leadership that results in policies and mechanisms to wisely use land resources within the seven-county Minneapolis St. Paul Metropolitan Area and to cost-effectively operate regional systems for transit and wastewater treatment.

In 1994, the Metropolitan Council concluded it needed a parcel-based GIS to support its mission. It also concluded that a collaborative approach with local government partners was the most prudent course of action for achieving this goal. The Council also concluded that championing a regional GIS collaborative was consistent with its over-arching corporate goals to foster collaborative solutions to needs in common with its local government partners and with its desire to be recognized as an effective leader in the region.

In October of 1995, the Metropolitan Council and the Minnesota Land Management Information Center co-sponsored two informational forums to assess support for pursuing a regional GIS and for the Council to facilitate the effort. Over 150 people attended these forums. Strong support was

8 See Appendix I for an overview of one benefit associated with each level of government, five of which are represented on the MetroGIS Policy Board. This material was shared with the Board at its first meeting in January 1997.

received for both concepts. In 1995, recognizing that a regional GIS could simultaneously address two of its high priority corporate goals, the Council approved a statement of its role in facilitating the creation of regional GIS (Appendix C) as recommended by the MetroGIS Coordinating Committee. Subsequently, the Council authorized additional staff for the project; funding for data and cost sharing agreements with each of the seven counties; and funding for outreach activities, general program administration, team support, pilot projects, and strategic initiatives to acquire institutional and technical knowledge needed to implement a regional data sharing mechanism.

Through May 1999, the Metropolitan Council has contributed in excess of $1.2 million in project funding, in addition to four FTE in staff support. Other sources of project financing have been about $380,000 from the Minnesota Department of Transportation for a master data license and maintenance agreement for addressable street network data and a $100,000 NSDI Framework Demonstration Grant awarded for the MetroGIS Fair-Share Financial Model and Organizational Structure Project (see the Strategic Initiatives section).

The Metropolitan Council concluded it would be difficult, not to mention extremely time consuming, to obtain significant financial contributions from other stakeholders until they acknowledged the benefits of a regional GIS. By removing the financial risk of participation, the Council cleared the way for essential stakeholders, regardless of their philosophy and financial resources, to actively participate in strategic decisions that have shaped MetroGIS.

MetroGIS Strategic Initiatives

Several MetroGIS strategic initiatives are currently in progress. One is complete. The following initiatives address needs critical to the success of MetroGIS and achieving its vision.

1. Obtain Endorsement From Key Stakeholders

This initiative is complete. In spring 1996, immediately following agreement on a mission statement and high level goals for a regional GIS, a stakeholder classification scheme was devised9. By December 1996, all eleven "essential stakeholder" organizations had approved a resolution (Appendix D) endorsing the MetroGIS principles and had appointed one of its members to serve as a member of the MetroGIS Policy Board. The Policy Board met for the first time in January 1997. The members and their affiliations are listed in Appendix E.

2. Execute Data and Cost Sharing Agreements

Geospatial data assembled by local governments within Minnesota is often distributed for a fee and with restrictions. Minnesota law permits cost recovery for datasets developed by government that have commercial value and whose development involved substantial public investment. For instance, most counties within the region currently maintain some cost-recovery policy for their parcel data as does the Metropolitan Council charges for its existing land use and other datasets.

The first phase, securing the agreements, is complete. In accordance with its MetroGIS facilitation

9 The scheme is posted at the MetroGIS web site at www.metrogis.org/organization/who are the stakeholders.

roles, the Metropolitan Council entered into interim data and cost sharing agreements10 with each of the seven counties in the Twin Cities Metropolitan Area. The focus is now on administering the provisions of these seven agreements. They foster a collaborative environment for testing solutions to technical and organizational obstacles to data sharing. The Council provided more than $635,000 to the seven counties to assist with local GIS data and systems enhancement projects that have regional significance as an incentive to the counties to share, without cost other than any modest costs for reduction, their data with all government units.

Each of the agreements has a three-year term and is intended to be superseded by agreements with the MetroGIS Policy Board. Two of them will expire on December 31, 1999. Extensions will be sought if the MetroGIS Policy Board decides to seek legal standing. Each of the seven Counties has or will receive funds ranging from $49,500 to $160,700 for GIS program and data enhancements that have significance for 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 serving the region during the term of the agreement,
- facilitate the creation and foster operation 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,
- abide by common rules for data access/distribution,
- maintain logs of the data they share, and
- provide the data sharing logs to MetroGIS to support research on the benefits of data sharing

3. Define Priority Information Needs

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, broadly representative process was devised to:

- identify priority regional information needs information needs common to stakeholder organizations, in particular those represented on the Policy Board,
- identify data needed to answer each priority information need,
- identify primary and regional data custodians and their responsibilities, and
- define critical standards, integration and aggregation specifications, and institutional policies necessary for MetroGIS participants to share commonly needed priority data.

An Information Needs Forum and three Business Object Framing Modeling Sessions held fall 1996 were the initial events for the project. A survey was administered in February 1997 to narrow the field of distinct information needs from 87 to the top 13. The highest priority information needs are not only significant to the internal business operations of a variety of key MetroGIS stakeholder organizations,

10 See <www.metrogis.org/publications/index of MetroGIS Publications in PDF Format/Moving MetroGIS From Concept to Reality: An Overview of the Metropolitan Council's Data and Cost Sharing Agreement Initiative> for more information about the objectives and expectations.

but are also highly dependent upon others for the data to address these information needs. In the near future, a summary of the ranking methodology used to identify MetroGIS' highest priority information needs will be available on the MetroGIS web site. Dr. David Arbeit, Director of the Minnesota Land Management Information Center (LMIC), and Dr. William Craig, Associate Director of the Center for Urban and Regional Affairs at the University of Minnesota, designed this methodology.

Thirteen priority business information needs11 were identified for MetroGIS. A consensus-based process also was created to identify desired specifications for data needed to answer each priority information need and candidate custodians for these data and their responsibilities. The seven NSDI Framework Functions, as outlined in the Framework Handbook published January 1998, have been incorporated into the methodology.

Work on the top MetroGIS information need, "location of MCD (city and township)/county jurisdictional boundaries", is complete. The Metropolitan Council has accepted responsibility to serve as the regional custodian and has developed the regional dataset. Preliminary work has been initiated on data specifications for regional school and watershed district jurisdictional boundary solutions. A partial solution has been implemented for the "addresses for people, places, and things" information need through a public-private partnership. This partnership between the Metropolitan Council, Mn/DOT and The Lawrence Group (TLG) provides free access to TLG's addressable street centerline dataset by government and academic institutions that serve Minnesota. In October 1998, the Governor of Minnesota awarded a Commendation as an Exemplary GIS Project to this partnership. Desired data specifications for the MetroGIS census geography information need are substantially complete and desired regional specifications for the parcel, future land use and existing land information needs should be complete fall 1999. MetroGIS is collaborating with the Minnesota Governor's Council on Geographic Information to develop specifications for the MetroGIS hydrology information need.

4. Implement Internet-Based Data Search and Retrieval Tool

Core functionality for Data Finder (www.datafinder.org), the MetroGIS internet-based data search and retrieval tool, became operational in April 1998. Data Finder is designed to facilitate data sharing by providing a means to quickly search metadata for data holdings relevant to specific needs and facilitate data retrieval. The concept is similar to that of the NSDI Clearinghouse. Consequently, there has been close coordination between the Data Finder project and Minnesota's Geospatial Data Clearinghouse, a node of the NSDI Clearinghouse infrastructure.

Emphasis for the past year has been on identifying incentives to institutionalize widespread development of metadata by MetroGIS stakeholders for their data holdings in a standardized format endorsed by the Minnesota Governor's Council on Geographic Information. Emphasis is on documenting data associated with the high priority regional information needs. The standardized metadata is then posted with the Data Finder database to enable it to be searched over the Internet. The findings and recommendations of this metadata facilitation effort will be presented at the 1999 National URISA

11 More than 120 persons representing governments, private and non-profit sector interests and academia serving the metropolitan area where 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 E.

Conference and summarized in a paper entitled "Making Metadata Part of Your Daily Diet." An expanded version of this paper will also be available on the MetroGIS web site.

In addition to continuing to encourage MetroGIS stakeholders to develop and post metadata with Data Finder, the next phase of the Data Finder project will involve expanding its functionality.

5. Identify A Sustainable Long Term Financing and Organizational Structure

Addressing this strategic issue is currently the highest priority of MetroGIS. A $100,000 NDSI Framework Demonstration Grant has been received to assist with this effort. A peer review forum is proposed for August and final consideration by the MetroGIS Policy Board is scheduled for October 27, 1999. At that time, the Board will be asked to decide if sufficient public purpose exists to seek legal standing for MetroGIS. If so, the Board will be asked to act on recommendations to secure sustainable financing for the organization and an appropriate organizational structure to move MetroGIS to the next level. Several assumptions (Appendix F) have been approved by the Policy Board to drive the development of the cost allocation model. They include recognition of previous investments, in particular by the Counties as producers of primary (source) data, recognition of existing formal partnerships between counties and local governments located within the counties, and acknowledgment that contributions cannot exceed perceived benefit.

The project consists of the following four major tasks:

Task A: Clarify Roles and Responsibilities

***Outcomes/Deliverables*: Identification of the roles, responsibilities and tasks beyond the** business needs of MetroGIS stakeholders that are necessary to the functions which the Policy Board adopted for MetroGIS (Appendix G) in September 1998. These include executive guidance, monitoring, communication, advocacy, and support for MetroGIS Data Finder as well as regional data development and management responsibilities associated with each of our thirteen priority information needs. The roles and responsibilities for Framework Collaboratives, as presented in NSDI Framework Handbook, provided the starting point for this task. High level differences between roles and responsibilities identified for MetroGIS and those identified for NSDI will be documented. Cost estimates to carry out these tasks for MetroGIS will be provided.

Challenges: Development of roles and responsibilities scenarios must balance the needs of prospective primary data producers, area integrators/regional custodians, and data consumers. No proven models exist to accomplish this balance. Consensus on a solution is necessary to achieve widespread participation.

Task B: Estimate the Costs of Tasks Identified In Task A

Outcomes/Deliverables: A realistic estimate of the "costs of collaboration". That is, the tasks and their associated costs beyond the internal business needs of the stakeholders but necessary to sustain operation of a mature MetroGIS organization.

Challenges: Completing Task A in a timely manner and accurately estimating the level of expertise and amount of time needed to accomplish each of the tasks. No proven models consistent with MetroGIS' needs exist to our knowledge.

Task C-1: Design Fair-Share Financial Model

Outcomes/Deliverables: A politically-acceptable cost allocation model that equitably distributes the "costs of collaboration" among the stakeholders consistent with their perceived benefits from MetroGIS.

Challenges: Defining "perceived benefit"12 and developing a scheme that balances amount of contribution with perceived benefit. Defining a means to balance the value of non-cash contributions, in particular, the relative value of data that addresses priority information needs against the need for cash contributions to fund administrative and maintenance needs of MetroGIS.

Task C-2: Identify Appropriate Legal Organizational Structure

Outcomes/Deliverables: A politically-acceptable organizational structure to sustain the stated mission of MetroGIS and a high-level implementation strategy, including any legislation needed to achieve any authorities not currently available. The implementation plan will include options for an agency to which the MetroGIS organization could be assigned, number of staff positions, and their responsibilities.

Challenges: There are no proven models consistent with MetroGIS' needs. Board consensus is a must if Legislative approval will be required. An acceptable balance among decision-maker representation must be achieved between primary producers, regional custodians/area integrators, and data consumer interests.

6. Finance Pilot Projects with Regional Significance

The Metropolitan Council, acting in its MetroGIS facilitation role, has financed three pilot projects outside of its GIS Data and Cost Sharing Agreements with the seven Metro Area Counties: facilitating a GIS Data Fair, mapping land use designations in Dakota County, and assisting the North Metro I-35W Corridor Coalition implement its GIS "backbone GIS database. The latter is the most significant, resulting in a subregional "backbone GIS" database including integrated: parcel, future land use, existing land use, and zoning data.

The Coalition is comprised of seven cities, located in two adjoining counties within the MetroGIS project area. The business needs the Coalition is attempting to address with GIS are similar to the business needs of MetroGIS stakeholders throughout the seven-county region. Specifically, the Coalition developed its subregional GIS to address the following objectives:

- Expand conventional land-use planning methods by applying livable community goals and objectives;
- Approach physical, social, and economic development issues in an integrated and multifaceted manner;
- Work at a subregional level to bridge the gap between regional policies and local circumstances; and
- **Implement the policies and strategies outlined in the Twin Cities Metropolitan Council Regional Blueprint.**

In addition to addressing similar business needs to those of many other MetroGIS stakeholders, the technical GIS procedures developed by the Coalition to merge parcel data

12 We will be relying upon three surveys/studies from which to craft these financial equity policies and definitions (1997 MetroGIS Information Needs Study, 1998 NSGIC survey-Minnesota component, and Will Craig's 1999 MetroGIS Benefits Study).

from two counties are directly relevant to technical hurdles that MetroGIS must resolve. MetroGIS is currently evaluating the policies and procedures developed by the Coalition for their applicability to MetroGIS needs.

In Appendix H, a detailed summary of the Coalition's leading edge work is presented in a document entitled "Using GIS In The Multijurisdictional Planning of Diverse Metropolitan Communities." This paper will be presented at the 1999 Nation URISA Conference in August.

MetroGIS Challenges and Issues

The MetroGIS vision that emerged out of public forums and strategic planning events held in 1995 continues to drive the active involvement of organizations within the Twin Cities metropolitan region. With the Metropolitan Council acting as a patron, offering significant start-up funds and staff support, tangible benefits have resulted, some of which are referenced in this paper. Still, the long-term future of MetroGIS is unclear: no permanent structure has been created, no stable source of funds have been committed, and data sharing agreements and license arrangements that currently facilitate extensive data sharing among MetroGIS participants will soon end.

This fall, the results of the MetroGIS NSDI Framework study will offer recommendations that may help resolve some of these uncertainties. But even with such recommendations, a sustainable MetroGIS will not be guaranteed. The following are some of the more evident challenges and issues that must be overcome, presented in no particular order.

1. **Clarifying Benefits for Data Producers.** MetroGIS has clearly benefited MetroGIS stakeholders who depend upon other organizations for data, especially organizations that depend on data from more than one data producer. School districts and watershed districts are good examples, especially when their jurisdictions cross county lines. Reliable and useful geodata that costs them little allow such organizations to fulfill their missions more effectively at reduced costs. However, counties are the primary data producers within Minnesota and depend only marginally on other organizations for most of the data they need. The case for county participation — essential for MetroGIS success — can be greatly strengthened if the benefits to them of data from other sources can be more convincingly documented.
2. **Developing Practical Common Data Specifications.** MetroGIS has identified its highest priority information needs, based upon public forums and formal surveys, and is working to develop clear data specifications to appropriately address those basic needs. Some of the data needs parallel the NSDI framework data elements, but others reflect local priorities. General specifications have been developed for some of the highest priority data, such as municipal boundaries, and de facto specifications have evolved for some others, such as an addressable transportation network. In all cases, adopted specifications must be supported by strong consensus. Developing data specifications that both work and receive consensus support requires a significant investment in time, resources and personnel. This is a challenge with no obvious solution.
3. **Respecting Costs of Collaboration.** MetroGIS participants, whether active on its Policy Board, its Coordinating Committee, or its working committees, have made a huge investment to help carry MetroGIS as far as it's come. These investments cannot be continued forever without obvious benefits or some form of compensation. As protocols for integrating local data within a regional

data infrastructure are implemented, some organizations may potentially incur new costs to adapt their data to be compatible with that infrastructure. These collaboration costs must be fully understood so that organizations can be fairly compensated for work not needed to meet their own needs.

4. **Adopting a Workable Organizational Structure.** MetroGIS still functions without legislative authority as an informal organization supported by the Metropolitan Council. Alternative legal structures are currently being evaluated as part of the NSDI Framework grant. A recommendation will be presented at a public forum later this summer and to the MetroGIS Policy Board in the early fall. Identifying a workable structure that can be supported by the principal MetroGIS stakeholders and then implemented is a significant obstacle to overcome and is directly linked to funding options

5. **Securing Adequate and Stable Funding.** Based upon the MetroGIS experience, the ongoing costs for maintaining basic support for MetroGIS is in the $300,000 to $500,000 range, depending upon the level of staff support for committees and the pace of development for some technical needs related to web site maintenance and data distribution. These costs are above and beyond what organizations already spend to meet their own geodata and GIS needs. They do not include data integration efforts beyond those that meet the immediate needs of the Metropolitan Council or data development costs for other regional needs. Nor do they include the costs for "data sharing incentives" such as those that made active data sharing possible thus far. .

6. **Adapting to State Data Practice Laws.** Minnesota laws governing data access, privacy, intellectual property, and cost recovery were reviewed by a state Information Policy Task Force that made some very significant recommendations in a recent legislative report. Controversial recommendations were considered but not approved during the 1999 legislative session and will be reintroduced next year. Several of these directly affect the currently ability of government to charge fees for data. Most local governments oppose the change, especially those that classify their geodata as having commercial value. The challenge is double-edged: while eliminating most data fees potentially removes a major barrier to data access, it also may curtail funding for geodata development and constrain MetroGIS from using subscriptions and fees as revenue sources to support for its work.

7. **Replacing "Data Sharing" Incentives.** MetroGIS participants have enjoyed an open data-sharing environment for the past several years, largely because of agreements between the Metropolitan Council and each of the seven MetroGIS counties. In exchange for a negotiated amount of funding to be used for data maintenance and other technical work that both meets the needs of the contracting county and addresses a MetroGIS issue, each county has agreed to make its geodata available to any public organization doing business within the metropolitan region. Several metropolitan counties had previously charged fees for their data, but essentially have waived those fees for MetroGIS participants in return for a negotiated amount. Continued "data sharing" incentives may be needed to maintain an open data sharing environment for MetroGIS.

8. **Maintaining Focus.** Keeping focused on the basic MetroGIS vision remains a challenge, especially as the real and perceived successes of MetroGIS become increasingly apparent to organizations elsewhere promoting the NSDI vision. MetroGIS was created to meet regional and local needs. MetroGIS staff has participated actively in Minnesota organizations seeking improved coordination of geographic information technology and with NSDI events sponsored by the Federal

Geographic Data Committee. For the most part all parties benefit, but maintaining focus on MetroGIS needs is, at times, a balancing act that requires constant attention.

Some Federal Role for Regional GIS Collaboratives

MetroGIS is honored to have this opportunity to suggest roles the federal government might consider to facilitate and nurture regional GIS collaboratives. The following suggestions are based primarily upon experiences gained as we have tackled institutional issues associated with implementing the MetroGIS vision. Our suggestions are.

1. **Advocate Data Sharing.** Federal agencies, particularly through the Federal Geographic Data Committee, have been strong advocates of data sharing through the NSDI. The vision is important and continued leadership is needed.

2. **Promote Dialog.** Continue to provide opportunities for officials of regional GIS collaboratives from around the country to meet and discuss issues and opportunities we have in common. Continue to bring the corporate and public sectors together to collaborate on common issues.

3. **Promote Standards.** Continue to facilitate development of model standards with broad representation from all key stakeholder communities.

4. **Maintain Grant Programs.** Continued funding is needed, especially to help regional collaboratives such as MetroGIS develop in a timely fashion. Continue support for data search and distribution solutions and to address institutional needs as currently provided by the NSDI Framework Demonstration Grant Program.

5. **Offer "Bridge Financing" for Regional and State Collaboratives.** Provide “bridge financing” to support regional GIS collaboratives until they secure a mature revenue stream. Continued development of MetroGIS will require funding from several key stakeholders in excess of their individuals needs. The Metropolitan Council agreed to finance the majority of the definition phase of MetroGIS, which could be effectively complete on October 27, 1999. Continued progress may require funds from the Metropolitan Council not justifiable by the direct benefits derived. This is likely to be an obstacle to establishing other regional collaboratives. Regional GIS collaboratives will encounter time consuming organizational hurtles such as legislation to authorize implementation of the organization as well as building political consensus to enter into the selected organizational structure.

   Federal participation as a stakeholder, acting to promote its NSDI objective, could help foster and nurture GIS regional collaboratives. To qualify for this “bridge financing", regional GIS collaboratives could be required to: a) adopt a business plan determined to be consistent with the NSDI philosophy and b) have an authorized organizational structure consistent with the functions stipulated in the business plan.

6. **Get Real About Data Integration.** Resolve the inconsistency between NSDI’s philosophy of aggregating data from highest accuracy source with the dilemma of the Census Bureau not being able to incorporate higher precision locally produced data. This situation results in significant and repeated manual effort by local government of no value to their GIS programs and in an age when they are trying to work more effectively in a digital world. To date, no federal data has been identified as a source to address a priority MetroGIS Information Needs.

7. **Support Research to Quantify Benefits.** Facilitate research that develops creditable and flexible methodologies to quantify benefit received from framework collaboratives.

8. **Participate Directly in Operating Collaboratives.** Consider participating directly in regional collaborations, contributing to their annual costs just as financial responsibility is shared by state, metropolitan, and local governments and other partners.

9. **Address Information Policy Issues.** Leadership is needed to help resolve information sharing and data access policies, both at the federal level and within states. For instance, it is common practice in Minnesota to restrict redistribution of data as a condition of sharing. Circumstances are not very different within other parts of the 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.

10. **Respect the Collaborators.** As the NSDI continues to mature, respect our time and limited resources. Our first priority is meeting the business needs of our respective organizations. NSDI-related activities must have relevance to our day-to-day operations and should not require expenditures or commitments outside of the scope of our business needs unless adequate compensation is provided

[1] See www.metrocouncil.org for more information about the Metropolitan Council's responsibilities.
[2] See www.metrogis.org for more information about MetroGIS as an organization, its objectives, and its accomplishments. See www.datafinder.org for MetroGIS's Internet-based tool to search for, view, and obtain data.

APPENDIX A

MetroGIS
Policy Board Members

Name			***Organization***
Commissioner	Dennis	Berg	Anoka County **(Vice Chairperson)**
Board Member	Conrad	Fiskness	Metro Chapter of MN Association of Watershed Districts
Council Member	Donn	Wiske	Association of Metropolitan Municipalities (AMM)
Board Member	Antoinette	Johns	Technology Information Educational Services (TIES) *Consortium of School Districts*
Commissioner	Dennis	Hegberg	Washington County
Commissioner	Randy	Johnson	Hennepin County
Commissioner	Edwin	Mackie	Scott County
Commissioner	Willis	Branning	Dakota County
Commissioner	Victoria	Reinhardt	Ramsey County **(Chairperson)**
Council Member	Terry	Schneider	Association of Metropolitan Municipalities (AMM)
Council Member	(new appt pending)		Metropolitan Council
Commissioner	John	Siegfried	Carver County

APPENDIX B

Major Accomplishments of MetroGIS

1. By Fall 1996, less than one year into the effort, consensus had been reached on principles to govern MetroGIS, an interim organizational structure with operating guidelines was in place, unanimous endorsement had been received from the policy bodies of each of eleven key stakeholder organizations, and a member from each of the eleven key stakeholder organizations policy bodies had agreed to participate as a member of the MetroGIS Policy Board to shape the policy for what has come to be known as MetroGIS.
2. Unanimous Policy Board endorsement was received May 1997 on thirteen high priority information needs common to MetroGIS stakeholders (Appendix E). These priorities serve as the framework for defining and investing in regional data solutions. A component of process to identify these priorities produced the MetroGIS Business Object Framing Model. The "fragments" pertaining to each priority information need are the starting points to define desired specifications for regional data solutions.
3. A regional data solution has been implemented for the top priority MetroGIS information needs: city, township, and county jurisdictional boundaries and a partial solution has been implemented for addresses for people, places, and things. Substantial progress has been made to identify regional solutions specifications for parcels, future land use, and census geography. This work should be substantially complete by fall 1999.
4. A partnership was established summer 1997 between the Metropolitan Council, Mn/DOT and The Lawrence Group (TLG) to provide free access to TLG's addressable street centerline dataset by government and academic institutions that serve Minnesota. MetroGIS Policy Board has endorsed this dataset as a primary source of addressing information (address matching) for MetroGIS stakeholders. In October 1998, this partnership as awarded a Commendation as an Exemplary GIS Project by the Governor of Minnesota.
5. The core functionality of MetroGIS Data Finder (www.metrogis.org) became operational April 1998.
6. Policy Board agreement was reached September 1998 on the functions that MetroGIS should support as a mature organization (Appendix G).
7. Data and cost sharing agreements were in place with all seven counties by fall 1998. Data shared is being documented by all seven counties and Metropolitan Council. The logs are being used by Dr. William Craig, with the University of Minnesota Center of Urban and Regional Affairs, for analysis of the benefits of collaboration and data sharing. Dr. Craig's study is funded by a NSDI Benefits Grant and is scheduled for completion fall 1999.
8. Several local GIS projects, with regional significance, are underway in conjunction with these agreements to enhance local GIS data holdings and system capabilities.
9. Standards have been endorsed by the Policy Board pertaining to metadata, addresses, regional projection and coordinate system, and a unique parcel identifier.
10. In 1998, an NSDI Framework Demonstration Grant was awarded for MetroGIS' Fair-Share Financial Model and Organization Structure Project and an NSDI Benefits Grant was awarded for Dr. William Craig's Data Sharing Benefits Study that uses MetroGIS as a subject. Dr. Craig is with the University of Minnesota Center for Urban and Regional Affairs.

APPENDIX C

Creation of MetroGIS:
Statement of the Metropolitan Council's Role

Background: The MetroGIS Visioning/Coordinating Team (representation from all major stakeholder interests) accepted this role statement on January 25, 1996. On February 8, 1996, the Metropolitan Council unanimously adopted this statement of its role in the creation of the MetroGIS.

Statement of Leadership Role

The Metropolitan Council accepts a leadership role to create a metro-wide GIS; an entity through which widespread sharing and exchange of GIS data sets and technology can become a reality among public agencies and private-sector organizations within the seven-county metropolitan area. Leadership is defined as the following activities:

- Finance, coordinate, and support the strategic planning and decision making processes,
- Develop and maintain regional data sets (e.g., land use, census geography/TAZ, road centerline & census address range, soils, imagery, administrative boundaries),
- Provide support (staff and/or equipment) to the visioning/coordination team and to strategic issue teams,
- Finance and support communication with stakeholders (activity status and opportunities to participate),
- Selectively design, finance, coordinate, and staff projects that address local GIS and MetroGIS program needs,
- Facilitate the execution of data/cost sharing agreements among stakeholders,
- Participate financially in a fair share of the long term maintenance of the MetroGIS,
- Any other activities consistent with the strategic plan and acceptable to all affected parties.

APPENDIX D

MetroGIS
RESOLUTION OF ENDORSEMENT

WHEREAS, it is in the public interest for public and private sector organizations to minimize duplication of effort and to implement technology which improves organizational efficiency and which minimizes the costs of carrying out their missions.

WHEREAS, Geographic Information System technology (hereafter referred to as "GIS") is a tool that all government organizations can utilize to improve organizational efficiency and to minimize costs regarding management, query, analysis, and dissemination of geographically-referenced data. (Refer to Exhibit A for a definition of terms.)

WHEREAS, sharing of geographically-referenced data among governmental organizations that serve the Metro Area would result in a number of intangible benefits that can not be accurately measured in dollars but nevertheless pay dividends for participation. These intangible benefits of participation in a multi-participant Metro Wide GIS include:

1) Improved cost-efficiency through reduced redundancy in data development and maintenance and through cost-sharing opportunities,
2) Improved decision making support and improved methods of analysis and presentation,
3) Access to data from other jurisdictions in a compatible format for analysis and query,
4) Improved communication with the public,
5) Improved management and retrieval of data,
6) Enhanced revenue opportunities from private sector for data consistent from county to county throughout the region,
7) Enhanced academic research capability,
8) Stronger bargaining position with vendors for purchases and support.

WHEREAS, the Metropolitan Council and the Minnesota Land Management Information Center (LMIC) co-hosted two GIS Forums on October 23 and 26, 1995, at which the concept of a Metro-Wide GIS (hereafter referred to as MetroGIS) and the Metropolitan Council's offer to facilitate its development were presented for discussion.

WHEREAS, over 150 persons, representing 88 different organizations (including all levels of government and some private sector interests), attended said GIS Forums and expressed strong support for: 1) the concept of developing a MetroGIS and 2) the Metropolitan Council's proposed role as project facilitator.

WHEREAS, a team of persons representing: 1) all governmental organizations and selected private sector interests serving the Metro Area and 2) diverse professional expertise was assembled in December 1995 to develop a shared vision for the MetroGIS initiative.

WHEREAS, said team of persons has come to be known as the MetroGIS Coordinating Committee.

WHEREAS, _____ County/Organization is represented on the MetroGIS Coordinating Committee by _____.

WHEREAS, the MetroGIS Coordinating Committee unanimously approved a Statement of Intent and a Decision Support Structure for the MetroGIS initiative that are attached as Exhibits B and C, respectfully.

WHEREAS, said Statement of Intent and said Decision Support Structure are the foundation philosophies from which MetroGIS is to evolve.

WHEREAS, an underlining principle of the MetroGIS Decision Support Structure is that participation in the decision making and eventual data sharing agreements by each of the seven Metro Area counties and the Metropolitan Council is essential to the creation and operation of a regional GIS, as described in the MetroGIS Statement of Intent.

WHEREAS, the MetroGIS Decision Support Structure recognizes the importance of cities, school districts, and watershed districts to be effectively represented in the decision making to move said regional GIS from concept to reality.

WHEREAS, the MetroGIS Coordinating Committee is hereby respectfully requesting _____ County/Organization to approve said Statement of Intent and Decision Support Structure, appoint a representative to the MetroGIS Policy Board, and affirm its representative to the MetroGIS Coordinating Committee.

NOW, THEREFORE BE IT RESOLVED, THAT the _____ County/Organizations Board hereby concurs with and approves said Statement of Intent and with the Decision Support Structure for the MetroGIS as approved by the MetroGIS Coordinating Committee and as attached in Exhibits B and C (*see page 2 in main body of paper*).

AND NOW BE IT FURTHER RESOLVED THAT the _____ County/Organization Board hereby appoints Commissioner/Board Member _____ to represent its interests on the *MetroGIS Policy Board*.

AND NOW BE IT FURTHER RESOLVED THAT the _____ County/Organization Board hereby affirms/appoints _____ to represent its interests on the *MetroGIS Coordinating Committee*.

Approved by the _____ County/Organization Board on _____, 1996.

EXHIBIT A

Definition of Terms

1) Geographic Information System (GIS) means a computer-based technology that consists of hardware, software, data, and personal designed to efficiently capture, store, update, analyze, and display all forms of geographically-referenced electronic information.

2) Geographically-referenced electronic data exist in three forms: graphic (parcel boundaries, street centerlines, planimetric [data captured from aerial imagery such as building foot prints, curb lines, and contour elevations]; non-graphic (tabular records that can be associated with graphic data-typical); and digital imagery.

3) The term "MetroGIS" refers to a stakeholder-governed entity that is in the process of being defined. Definition of this entity is intended to evolve through the implementation of the MetroGIS Decision Support Structure and as the participants come to understand the organizational and data needs of the other stakeholders.

EXHIBIT B

Statement of Intent for a Regional GIS *(MetroGIS)*

(On March 22, 1996, the MetroGIS Coordinating Team unanimously endorsed the following statement to guide the creation and operation of the MetroGIS.)

> "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 usable.
>
> The desired outcomes of a regional GIS include:
>
> < Improve the effectiveness, equitability, responsiveness, and efficiency of participant operations.
>
> < Improve understanding of the dynamics of the seven county Metro Area and cooperatively chart courses to improve the quality of life and competitiveness for economic development.
>
> < Reduce the cost of data acquisition, management, and maintenance.
>
> < Increase credibility of data utilized in cross-jurisdictional decision making; minimize data redundancy."

APPENDIX E

Top Thirteen MetroGIS Information Needs

Adopted by Policy Board -- May 1997

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

1....the boundaries and characteristics of a specified jurisdiction (*ex: city, school district, county, police 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, acquifers, 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)**

APPENDIX F

Assumptions
MetroGIS Fair-Share Financial Model and Organizational Structure Project

The MetroGIS Policy Board has endorsed the following assumptions from which to devise a fair-share financial model and appropriate organizational structure for MetroGIS.

Financial/Cost Assumptions:

- Broader funding support for MetroGIS is needed.
- Fair user rates will be established based on perceived benefit to the user.
- Benefits to the user will be defined (financial and non-financial).
- User rates will be set to assure a financially stable MetroGIS.
- A flexible model will be developed as a tool for MetroGIS, allowing modifications based on MetroGIS' changing needs.
- Producers of endorsed primary data (data which is integrated into an approved regional data solution) that is contributed to the MetroGIS data pool will receive nominal compensation from MetroGIS for their participation in the form of a "supplemental data maintenance payment". This payment is to compensate the producer for sharing data to all government at no cost other than to cover modest data reproduction expenses and to defray costs attributable to sharing data with organizations outside of their jurisdictions.
- Producers of primary dataset will not be asked to support tasks or data related activities that exceed their internal business needs. They will be encouraged, but will not be required to update/enhance primary datasets that are inconsistent with regional specifications. (E.g. the amount of supplemental data maintenance payment will be proportionately higher for fully compliant primary datasets.)
- Regional data custodians will be compensated for all tasks in excess of their internal business needs.
- Data consumers will have free access to data obtained from MetroGIS' primary and regional data producers when by telecommunications transfer and shall not pay more than a modest fee to cover data reproduction costs for other means of data transfer.
- Not all primary data is of equal value in terms of counting toward defraying the costs of collaboration assigned to a particular organizational class (cities, counties, school districts, watershed districts, metropolitan, state, federal, and non government.) The model shall recognize the large investment counties have made to develop their GIS capabilities and the significant value of this investment to MetroGIS.
- Financial support for MetroGIS will come primarily from data consumers proportionate to the benefit perceived by organization class.
- Existing formal GIS cost sharing agreements among counties and units of government within their boundaries must be recognized in the fair-share financial formula.

Data Sales Assumptions:

- Intellectual property rights for producers of primary data contributed to MetroGIS shall remain intact.
- MetroGIS will not benefit from sales of data in the form contributed to MetroGIS by primary producers unless authorized by the primary producers.
- Data sales will be "zeroed-out" in the initial fair-share financial model.

APPENDIX G

	Functions Appropriate for MetroGIS		
	(Adopted by the MetroGIS Policy Board -- September 30, 1998)		
	Functions	**Scope**	**Is Function Currently Provided?**
	Coordination and Technical Functions		
1	Promote and endorse voluntary polices which foster coordination of GIS among the region's organizations.	Core	Yes
2	Identify unmet GIS needs with regional significance and act on these needs.	Core	Somewhat
3	Facilitate data sharing agreements and licensing among MetroGIS stakeholders.	Core	Partially -- Interim agreements
4	Develop and endorse standards for GIS data content, data documentation, and data management.	Core	Regionally significant data
5	Require standardized GIS data content, data documentation, and data management for regional datasets.	Core	No
6	Endorse standards for telecommunication protocol and networks.	Core	No
7	Provide a repository of GIS human resources information (centralized job posting/position descriptions).	Desireable	No
8	Develop master contracts for regional GIS projects, when appropriate.	Core	Demonstration Orthoimagery Project
9	Promote development and exchange of GIS applications and procedures that serve GIS needs.	Core	Somewhat
	Data Development and Distribution Functions		
1	Create and maintain datasets for MetroGIS based on identified priorities.	Core	Yes
2	Fill gaps in metadata based on identified priorities.	Core	Partially -- County Agreements
3	Provide a directory of data within region and a mechanism for search and retrieval of GIS data	Core	Data Finder
	Service Functions		
1	Provide technical assistance to participants to retrive, translate, and use data.	Desireable	Some -- Street Centerlines
	Research Functions		
1	Undertake research to meet common regional GIS needs.	Core	Some
2	Promote collaborative funding of pilot projects that meet regional needs.	Core	Ortho project, I-35W pilot
	Outreach Functions		
1	Identify GIS training and continuing education needs and encourage participation	Desireable	No
2	Advocate for MetroGIS needs and desires with state and federal policy makers	Core	Some - NSDI/PUC
3	Maintain liaison relationships with committees/organizations with similar objectives to MetroGIS.	Core	Yes
4	Promote forums for MetroGIS stakeholders to discuss common GIS needs and opportunities.	Core	Yes
5	Publish MetroGIS newsletter.	Core	Yes
6	Maintain MetroGIS world wide web site.	Core	Yes
7	Market MetroGIS data and products	Core	No

APPENDIX H

North Metro I-35W Coalition
8525 Edinbrook Crossing, Suite 5
Brooklyn Park MN 55443
Phone: (612) 493-8450
Fax: (612) 424-1174
http://www.i35w.org

USING GIS IN THE MULTIJURISDICTIONAL PLANNING OF DIVERSE METROPOLITAN COMMUNITIES

Abstract: The North Metro I-35W Corridor Coalition (Coalition) proposes to present an overview of its aims and objectives in helping seven diverse suburban Twin Cities communities respond to rapid metropolitan growth and change. Three years ago, these communities asked themselves: "Can we compete in a global economy if we develop separately and continue to compete with one another? Doesn't it make more sense to share ideas and resources to collectively build more livable communities?" This presentation will focus on how and why the Coalition was formed and how it is managed and maintained. The Coalition will present an overview of its GIS Work Program, which encompasses a number of unique projects designed to enhance the use and effectiveness of GIS within the region. The presentation will detail some of the technical aspects of its development and management.

INTRODUCTION

In response to rapid metropolitan growth and change, seven diverse suburban communities—Arden Hills, Blaine, Circle Pines, Mounds View, New Brighton, Roseville, and Shoreview—have formed a joint powers organization, the North Metro I-35W Corridor Coalition ("the Coalition"). The Coalition seeks to construct an interjurisdictional planning and development framework that is integrated and coordinated at the municipal level. This effort has four primary objectives:

- ♦expanding conventional land-use planning methods by applying livable community goals and objectives;
- ♦approaching physical, social, and economic development issues in an integrated and multifaceted manner;
- ♦working at a subregional level to bridge the gap between regional policies and local circumstances; and
- ♦implementing the policies and strategies outlined in the Twin Cities Metropolitan Council Regional Blueprint.

To begin this work, the Coalition launched two major initiatives: (1) development of a subregional Geographic Information System (GIS) that is accessible to member communities; and (2) a Comprehensive Livable Community Urban Design and Transportation study that also addresses socioeconomic and environmental implications for the subregion's residents, businesses, and educational and cultural institutions. At the heart of the Coalition's work is its concern for maintaining and enhancing quality of life in its communities as the region continues to evolve.

The Coalition has bundled its activities into the following three livable community work areas that form a "Subregional Urban Design and Planning Framework."

♦***Building Metropolitan Towns:*** joint actions that strengthen and create connections—physical, social, and economic—among communities.
♦***Redefining Metropolitan Competitiveness:*** cooperative strategies that position the subregion to attract economic development and support a local economy that values and thrives in livable communities.
♦***Ensuring Healthy Neighborhoods:*** coordinated initiatives to build neighborhoods that support individuals and families throughout their life cycles.

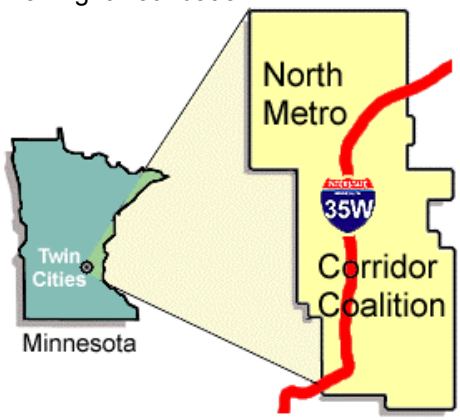
Currently, the Coalition is building a common base of information and data from which it can coordinate planning and implementation programs at the subregional level. The first phase of the GIS initiative has been completed. This puts into place the technological capability to share information across political borders and between departments and agencies. The Coalition also is commissioning studies in the areas of transportation and land use, housing, natural resources and the environment, economic development, and community outcomes. With the information obtained from these studies, along with data and applications from the GIS initiative, the Coalition will continue to refine and augment the subregional livable community urban design and planning framework and will begin to implement subregional programs and policies.

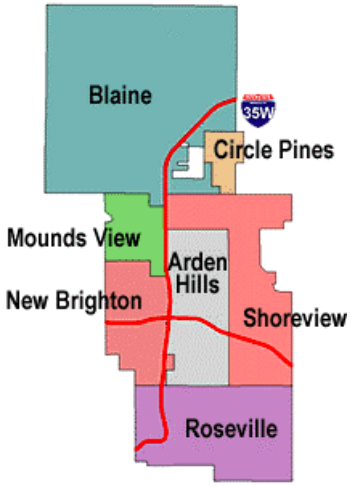
WHAT IS THE I-35W COALITION AND HOW IS IT ORGANIZED?
The I-35W Corridor Coalition is a group of seven Minneapolis/St.Paul northeastern suburban communities located within the North Metro I-35W transportation and employment shed. In December 1996, the communities of Arden Hills, Blaine, Circle Pines, Mounds View, New Brighton, Roseville, and Shoreview entered into an agreement that allows the cities to act jointly to help shape the future of this subregion.

The Coalition is led by a 14-member Board of Directors—the mayor and city manager or administrator from each community—each with one vote. It is assisted by a Community Development Directors Committee, which has one development director from each member city. The day-to-day running of the Coalition is managed by a hired administrator.

To enable the Coalition to remain focused on its objectives, the Committee has formed numerous Task Forces to oversee the development of specified elements of the Coalition work areas. One such group is the GIS Task Force which ensures that all aspects of the GIS program are coordinated and all goals are met.

Under the Community Partners Program, businesses and organizations may join as non-voting members. The Coalition participants include: Ramsey and Anoka Counties, four local school districts, the Minnesota Department of Trade and Economic Development, the Minnesota Department of Transportation (MnDOT), the Metropolitan Council, the University of Minnesota Design Center for the American Urban Landscape and the McKnight Foundation.





WHY HAS IT FORMED?

The Coalition has a broad and multifaceted work program, directed to resolving contemporary issues facing municipal governments in the Twin Cities metropolitan region.

Among the concerns shared by individual Coalition communities are:

- rising congestion on regional and local transportation networks;
- changing demographics;
- aging housing stock that is losing its marketability; and
- shifting economic development patterns and needs.

The operating assumption is that these issues are not confined to municipal boundaries and, thus, are best addressed and resolved through cooperative action.

WHAT UNIFIES THESE SEVEN COMMUNITIES?

The seven member communities of the Coalition share more than just an association with North I-35W—they are part of a subregional setting that has been shaped by common geography, patterns of movement, economics, and cultural connections. Here we identify several of the forces that continue to unify the communities and some of the common issues that could be addressed through subregional planning and collaboration.

Landscape and Natural Resources

Much of the subregion lies within the Rice Creek Watershed, which is characterized by the vast marsh and wetland complexes of the Anoka Sand Plain and the rolling hills and pocket lakes known as the North Ramsey Mounds. The physical forms of these two distinctive landscapes have shaped transportation routes and created islands of residential and industrial development oriented to such resources as lakes or gravel deposits.

Common Issues: Natural resources, the economic core that once drew subsistence farmers and early industrialists, now draw homeowners and businesses seeking amenities and quality building sites. Preserving, restoring, and enhancing these assets as a subregional network holds promise for ensuring property values and attracting new residents and businesses to Coalition communities.

Location and Movement Patterns

Communities within the subregion are conveniently located near job markets in the central cities and along North I-35W and 694. This is both an advantage and a challenge.

Historic transportation network provides multiple commuting routes which, although convenient for Coalitions residents, are equally attractive to outside commuters traversing the subregion. The resulting through traffic creates tensions in neighborhoods and along commercial corridors where cities are anxious to improve pedestrian and transit environments.

Common Issues: The subregional network of transportation systems has great potential to sustain and support economic development and redevelopment while enhancing the livability of Coalition communities. Realizing this potential will require interjurisdictional planning around a common set of transportation and land use planning principles.

Local Economy and Economic Development/Redevelopment

Although historically reliant on Minneapolis and St. Paul markets, employers, and labor pools, the subregional economy is now a competitive unit which draws shoppers and workers from adjoining communities as well as the central cities. Not immune to larger economic forces and trends, however, the subregional economy is on the verge of another phase of redevelopment and development as businesses become even more mobile and workforce training requirements change with increasing frequency.

Common Issues: Under these circumstances, economic development becomes more than site development and financial incentive packages. It broadens to include a full complement of strategies that range from workforce development to subregional approaches to business recruitment and retention to greater diversity in housing choice.

Housing and Community

Many of the Coalition communities began as lake cabin neighborhoods or post-war subdivisions for the do-it-yourself homebuilder. Over time, these neighborhoods blended and connected through the formation of school districts and new municipalities. Public institutions, along with religious and civic organizations, offered the social and political structure around which a larger sense of community has evolved. Now, these same organizations and institutions are being asked to work in new ways to address unstable property values and growing concern for the health of individuals and families.

Common Issues: Responding to this request requires cities to devise unconventional housing programs that address home maintenance and remodeling issues, public infrastructure improvements, and amenity enhancements and to join collaborative initiatives that follow families and individuals as they cross municipal boundaries for work, school, health care, shopping, and recreation.

COALITION FACTS AND FIGURES

Combined, these seven cities form the third largest community in Minnesota by population, with over 155,000 residents located in two counties and five school districts.

With 83 square miles of land, there are approximately 55,000 homes and 4,000 businesses with 85,000 jobs. It is estimated that the number of jobs will grow to 120,000 by 2010. In 1998 alone, there was over one quarter of a billion dollars in new growth.

There are 775 miles of streets, 43 miles of rail line, 3,000 acres of public parks and open space, and 16,500 acres of lakes and wetlands.

WHAT IS THE VISION OF THE COALITION? WHAT ARE ITS GOALS?

In its vision statement, the Coalition declares that members will jointly and cooperatively plan for and maximize the opportunities for regional community development, quality growth, and diversification in the North Metro through a system of collaboration. In addition to these three goals—regional community development, quality growth, and diversification—the Coalition has incorporated the Livable Community Goals established by the Minnesota State legislature in 1995. As a way of meeting these goals, the Coalition has developed the objectives outlined below.

Regional Community Development Objectives:

- Work cooperatively with MnDOT, the counties, and other agencies to plan for transportation improvement, mass transit needs, and other infrastructure improvements along the I-35W corridor to maintain and improve service and to help stimulate business growth and labor availability.
- Develop a joint marketing program among the members to attract and retain quality industrial and commercial tax base and employment.
- Develop a coordinated, collaborative GIS to efficiently share information and develop consistent and cooperative land use policies.
- Develop a current and comprehensive socioeconomic database that can be updated on a regular basis enabling the detailed examination of Coalition neighborhoods.
- Ensure an effectively trained workforce to meet the needs of the business base and ensure that transit options and employee mobility concepts are incorporated into the North Metro transportation system plan to serve member communities.

Quality Growth Objectives:

- Research the business base and the availability of development and redevelopment opportunities.
- Develop a code of ethics to be used by Coalition communities as an attraction and retention tool.
- Develop a collaborative and coordinated effort in other areas of regional municipal interest, including training, resource sharing, and program development.

♦Research and identify contaminated sites; pursue funding sources for their redevelopment and work to ensure quality redevelopment.

Diversification Objectives:

♦Develop a Coalition strategy to ensure adequate life-cycle housing opportunities in member cities.

♦Pursue the use and distribution of all available resources to ensure that housing needs are adequately met.

HOW DOES IT PLAN TO MEET THESE GOALS?

Research and Inventory

The first strategy addresses the joint need to develop a shared information base. Cooperative planning and coordination is made difficult by conflicting or incomplete data on topics ranging from natural resources to socioeconomics to transportation. The Coalition seeks to break through this barrier by developing subregional data sets that provide uniform information and by developing common sets of planning terms that organize and utilize data consistently within the Coalition.

Joint Programs and Policies

The second strategy puts the shared information base to work in the form of joint programs and policies. Housing is a good example. The Coalition plans to use information generated from the housing inventory to understand the diversity of housing opportunities along the corridor, to develop subregional programs for addressing maintenance and renovation issues and, possibly, to adopt a common maintenance code for enforcement throughout the subregion.

Joint Funding

Joint funding is the final strategy envisioned by the Coalition. Like the other strategies, joint funding can be pursued in several ways. Joint applications can be structured around programs administered by the Coalition or for programs that cities administer individually according to specific needs. Also, there is the possibility of joint proposals to the legislature to enable Coalition cities to work in new and creative ways with existing financial tools.

HOW DOES THE COALITION ORGANIZE ITS WORK?

The ambitious goals of the Coalition and the unique partnership of its members require new and innovative methods of working. Guided by the policies and strategies of the Metropolitan Council's Regional Blueprint and by the Livable Community Goals established by the Minnesota State Legislature, the Coalition has drafted a Subregional Urban Design and Planning Framework to help direct its efforts. This framework challenges conventional planning and is built upon:

♦a move away from individual projects and towards integrated subregional systems;

♦information sharing across departments and political / jurisdictional boundaries; and

♦partnership and collaboration in the face of common problems and challenges.

The Coalition's framework serves as a structure around which it organizes work plans, working groups, and financial reporting; sets priorities; creates partnerships; and links individual projects.

WHAT IS THE GIS INITIATIVE?

In 1997, the Coalition embarked upon the construction of its subregional GIS data base. The system provides a more efficient, more effective, and less expensive method of sharing and coordinating information between member cities. This shared data base helps the Coalition identify trends within the subregion, recognize the needs of its residents, and assists in developing programs and policies that address these needs. For example, manipulating this data allows users to:

♦***analyze social demographic information*** in ways that enable Coalition cities to evaluate how effectively policies, services, and programs meet such residents' needs as housing, transit and transportation, and job training;

♦***identify sites suitable for development and redevelopment*** by applying search criteria for querying the GIS base (incorporating information on soil types, floodplains, wetlands, transportation networks, zoning, etc.);

♦***coordinate land uses*** across city lines to avoid conflicts between new development and existing uses and maximize development opportunities;

♦***develop traffic capacity models*** and divert traffic to / from minor arterials to help relieve traffic congestion;

♦***calculate the density of potential transit users*** along selected routes and the community transit centers that will serve them;

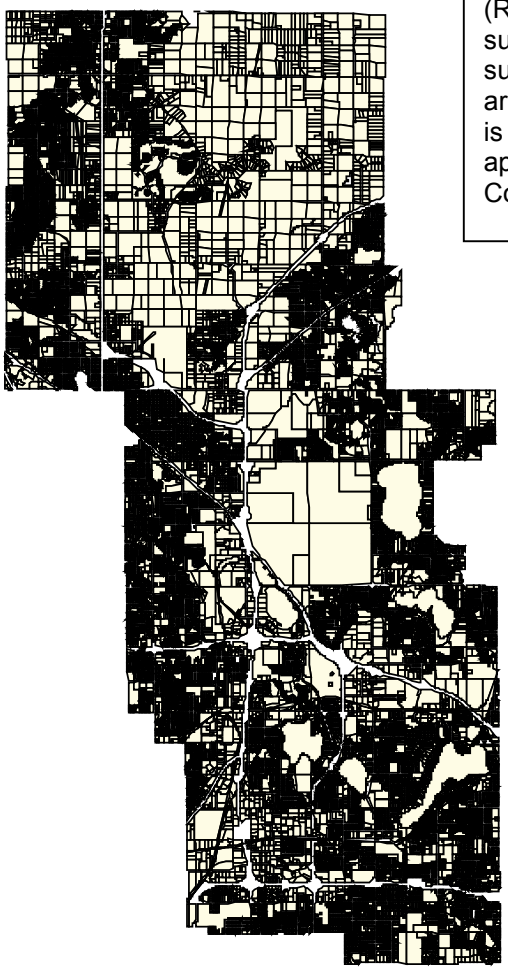
♦***inventory natural resources*** to identify greenway corridors, potential acquisition sites for trails and open space, development and redevelopment sites linked to ecological corridors, and brownfield redevelopment opportunities;

♦***assist new businesses*** in locating within the subregion by displaying available spaces for lease or purchase; and

♦***integrate and analyze diverse data sets*** to provide comprehensive subregional and local information to aid decision-makers in their efforts to achieve Livable Community Goals.

♦***enable cities to "get-up-and-running" with GIS*** much more quickly and cheaply than would be the case if they were to undertake GIS implementation individually.

The foundation of the Coalition GIS is it's parcel-level data base. Consisting of over 55,000 parcels, this base is supplied on a quarterly basis to the Coalition by two metropolitan counties (Ramsey and Anoka). The county support has been critical in the success of the GIS Initiative. A rich array of property-related attribute data is provided, fuelling many of the GIS applications developed to support Coalition decision-making.



BUILDING THE COALITON SUBREGIONAL GIS

Throughout the three-year period from 1997 through 1999, the Coalition GIS Task Force has been guided by the following general work plan:

- develop a fully integrated and maintained GIS parcel-level data base
- establish a dedicated Coalition GIS data server
- establish electronic high-speed data links between Coalition cities
- develop effective data dissemination techniques
- provide GIS training for Coalition cities at multiple levels
- identify and produce custom GIS applications to support the needs of the Coalition

To date, the Coalition GIS has evolved in the following way:

1997 – "Gathering the Pieces"

The first year involved the identification of potential benefactors, data suppliers and data integrators. The Coalition secured a grant from the Metropolitan Council's MetroGIS initiative in support of the Coalition GIS as a subregional, intergovernmental pilot project (http://www.state.mn.us/intergov/metrogis/). As a part of the funding proposal, the Coalition will be sharing the following with other metropolitan local units of government: new GIS applications, approaches to data sharing, and data development strategies.

Agreements were set in place with Ramsey County, who since 1985 have been building and maintaining a highly-accurate digital parcel data base. A cooperative relationship with the Ramsey County GIS Users Group was also established. In addition, agreements were put in place with local cable commissions to secure cable infrastructure to allow rapid data upload and download between communities and the data server.

1998 – "Building the Base"

Phase 1 of the GIS Initiative was essentially undertaken during this year. This consisted of: developing automated parcel integrating and checking techniques; developing parcel integrity reporting methods in order to inform both the data recipients and the data providers about data anomalies; purchase and installation of the Coalition data server; establishment of links to Coalition cities through cable access; creation of data layers derived from county parcel base data and city attributes such as – zoning, existing land use and future land use; production of base mapping; integration of various digital data sets from providers at the state, county and local level.

An important factor in the successful building and maintenance of the base has been the hiring of PlanSight LLC in the role of GIS coordination. PlanSight staff work closely with GIS Task Force Members.

1999 – "Development and Distribution"

The Coalition has constructed a subregional **intranet** "Data Warehouse" that can be used to browse and access information at all scales, ranging from the individual parcel to subregional networks. This on-line service will enable member cities to download base data from the Coalition's central GIS server to process locally, and to upload their own data to be shared with other member cities. The Coalition is utilizing several strategies to build its warehouse: (1) data sharing agreements with agencies and departments of different governments and non-governmental organizations; (2) acquisition of existing data sets; and (3) generation of new data through commissioned studies.

The Warehouse is essentially a "one-stop-shop" for all GIS needs. Users can review metadata and GIS procedures documentation prior to downloading the data of their

choice. This data could cover the extents of their own city or their neighbor, should they want to undertake a project which involves cross-jurisdictional issues. Subegional data sets have also been created.

Another major GIS product delivered in 1999 has been the "On-Line-Atlas". This is a static **internet** mapping product which can quickly and simply deliver address and other city base map images to both Coalition staff and also to the public. It is a precursor to live on-line, query-based web mapping which will be developed at a later stage.

The Task Force has drafted policies on GIS data storage, use and dissemination. Issues of data privacy and licensing are also under close scrutiny.

An important element for the GIS Initiative has been the education of its GIS Users. In-house needs assessments have been undertaken along with ArcView GIS training. Following this, individual one-on-one instruction in utilization of Coalition GIS data was conducted. An informative "GIS FLYER" is posted electronically to all users on a regular basis to keep them abreast of the dynamic nature of GIS technology.

Links have been established with the University of Minnesota Design Center (as a Coalition participant) in the development of their **Livable Community Information System**© (LCIS). This GIS utilizes base data from the Coalition GIS and follows data standards developed through cooperation with the GIS Task Force. The LCIS will identify physical, social, and economic characteristics of livable communities at the neighborhood, municipal, and subregional levels. Once these parameters are agreed upon, the GIS data sets that best describe and measure these characteristics at each scale will be "bundled," and applications developed to offer a multifaceted planning picture. For example, when a city council searches for the best location for a mixed-use development that includes affordable housing, staff can suggest a range of sites with access to transit lines, amenities, schools, health and day care services, livable-wage jobs, and basic goods.

1999 and beyond – "Where do we go from here"

The Task Force will strive to make the Coalition Subregional GIS as user friendly as possible through the continued refinement of the Data Warehouse. In addition, many new data sets will be added to the Warehouse as Coalition studies are undertaken. All consultants who produce GIS-related data will be required to follow data guidelines as directed by the Task Force.

MapObjects web mapping applications will be developed in the near future. This will be possible through a generous ESRI Local Government GIS Startup Grant.

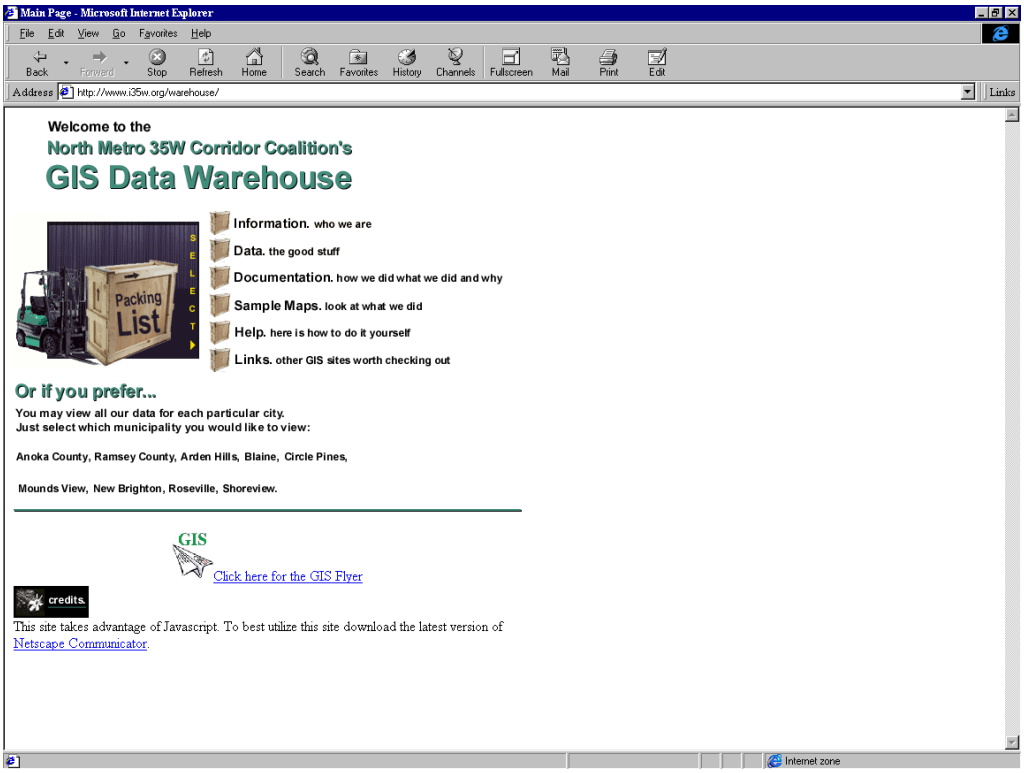
The results of a very exciting Socioeconomic Data Project will also be integrated with the GIS data base. This project is developing current and accurate demographics for all Coalition neighborhoods. It is an innovative approach which merges and synthesizes data from a large number of public data sets. Sources include Coalition partners such as: school districts (school census data), cities (utility data), and other state and local government bodies who provide drivers license and vehicle registration data, property tax data and other pertinent information. The data processing is being undertaken by Insight Mapping and Demographics who operate under a non-disclosure agreement which prohibits the sharing or distributing of household-level profiles. Data is summarized to a block-level and can be integrated with GIS to permit flexible user-defined rollup to any neighborhood, planning district or census area. Data to be delivered includes household and population counts, household type and age characteristics, household turnover data, housing data etc.

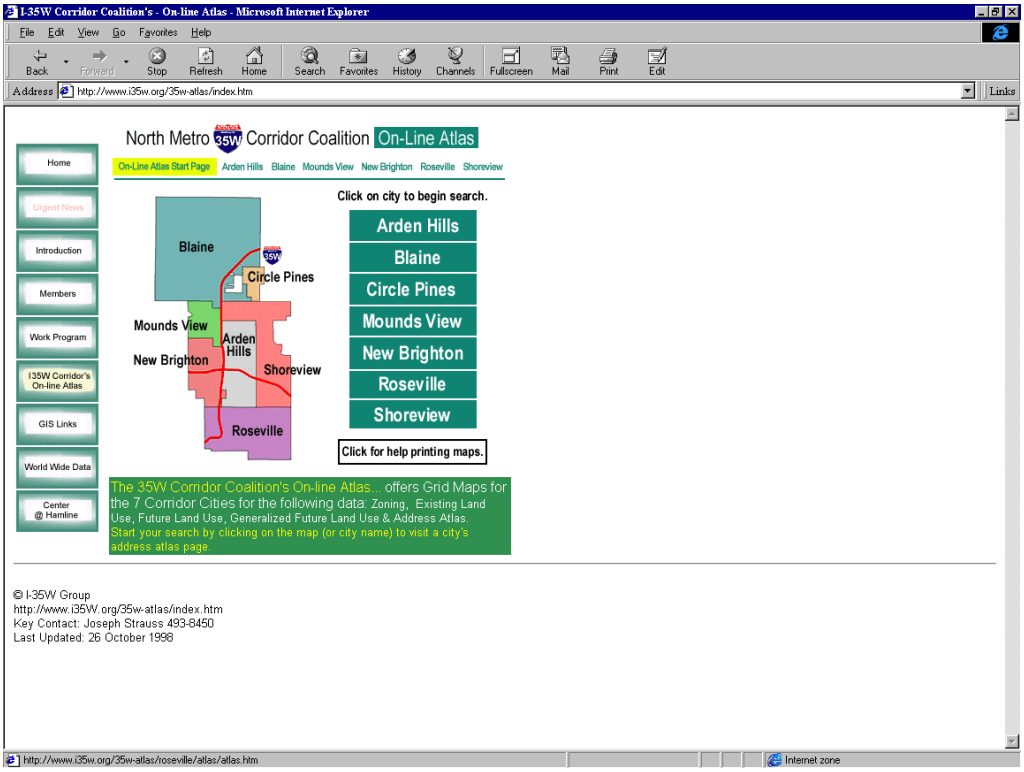
WHAT'S NEXT?

The work plan for the Coalition is constantly evolving as additional information about the subregion becomes available and priorities are recognized. Until the late spring of 1999, the Coalition will continue to oversee and receive feed-back from the five study areas outlined above. At the conclusion of this discovery period, the Coalition will aggregate and synthesize this information. By the end of 1999, a refined framework will prepare the Coalition for the next stage of work that begins to implement subregional programs and policies.

With its unique and innovative approach, the Coalition will continue to serve as a model of subregional planning, sharing its tools and ideas with other communities and planning bodies. The GIS Initiative is a perfect example this. Its techniques and products are made available to its member cities, the Metropolitan Council in its metropolitan-wide GIS effort supporting regional planning, to other Coalition participants and to the public. In addition, it brings those who utilize GIS technology together through the exchange of innovative ideas.

The Coalition has sought support from a wide variety of organizations and individuals, both from within and outside of the subregion. The North Metro I-35W Corridor Coalition truly is a collaborative effort, currently involving a number of local, regional, and state agencies and organizations. As the next stages of work evolve, the Coalition will continue to welcome input and assistance as it strives to maintain and enhance the quality of life for those living and working in the area.





REFERENCES

Lanegran, David and Robert Marcotte. "Development of Communities in Northwest Ramsey and Adjacent Anoka County." In *I-35W Corridor Coalition Comprehensive Livable Community Urban Design and Transportation Study: Phase I, Track 1 Report*. C. Swenson and W. Morrish, ed., 1998.

ACKNOWLEDGEMENTS

Much of the content of these proceedings are based on findings and recommendations included in the ***I-35W Corridor Coalition Comprehensive Livable Community Urban Development and Transportation Study: Phase I, Track 1 Report*** published May 1998 by the Design Center for American Urban Landscape, College of Architecture and Landscape Architecture, University of Minnesota. For information about this report, please contact Joseph Strauss, Administrator.

Other contributors include: David Windle, GIS Coordinator, City of Roseville; Kevin Ringwald, Assistant City Administrator, City of Arden Hills; Carol Swenson, Research Fellow, University of Minnesota Design Center for the American Urban Landscape; Jason Zimmerman, Research Fellow, University of Minnesota Design Center for the American Urban Landscape; Jerry Happel, Principal, PlanSight LLC; John Carpenter, Principal, Insight mapping and Demographics.

Appendix I

MetroGIS

Benefits to Local, County, Regional, State and Federal Organizations

MetroGIS: Benefits

Federal: U. S. Census Bureau

The Organization: The U. S. Census Bureau collects, organizes and distributes social, demographic and economic information for the United States of America.

The Issue: The Census Bureau relies on local input to assure complete and accurate information is available for the decennial census. Local agencies can best respond using GIS tools to speed the process, improve accuracy and assure quick response to census requests.

The Census Bureau uses the TIGER/Line file to support the mapping and related geographic activities required by the decennial census and sample survey programs. The lines in TIGER are used to form census block and other boundaries. While the TIGER data is sufficiently accurate for the Census Bureau and many other uses, its positional accuracy does not allow locally maintained GIS data to be accurately matched to census data. Local agencies can not use TIGER data to effectively fulfill Census Bureau request.

In the Past. Communities have reviewed census address lists and housing counts to verify their accuracy and manually reviewed and edited census boundary information using paper maps.

Today. While many of the same review processes continue to be used, a MetroGIS project is underway to assign census block designations to locally developed GIS road data. The road data, which forms many census block boundaries, is aligned to parcel data. By adding non-road boundaries to the road information complete census blocks can be formed. The result creates an accurate census geographical database that serves local needs.

In the Future. When the work is completed and census boundaries match parcel data, local officials will be able to directly compare the census blocks with parcel data. The number of housing units in a block can be derived from parcel data. Since the local parcel files are continuously updated, they contain the most current information available. Many Census Bureau requests can then be fulfilled quickly using GIS.

Value.

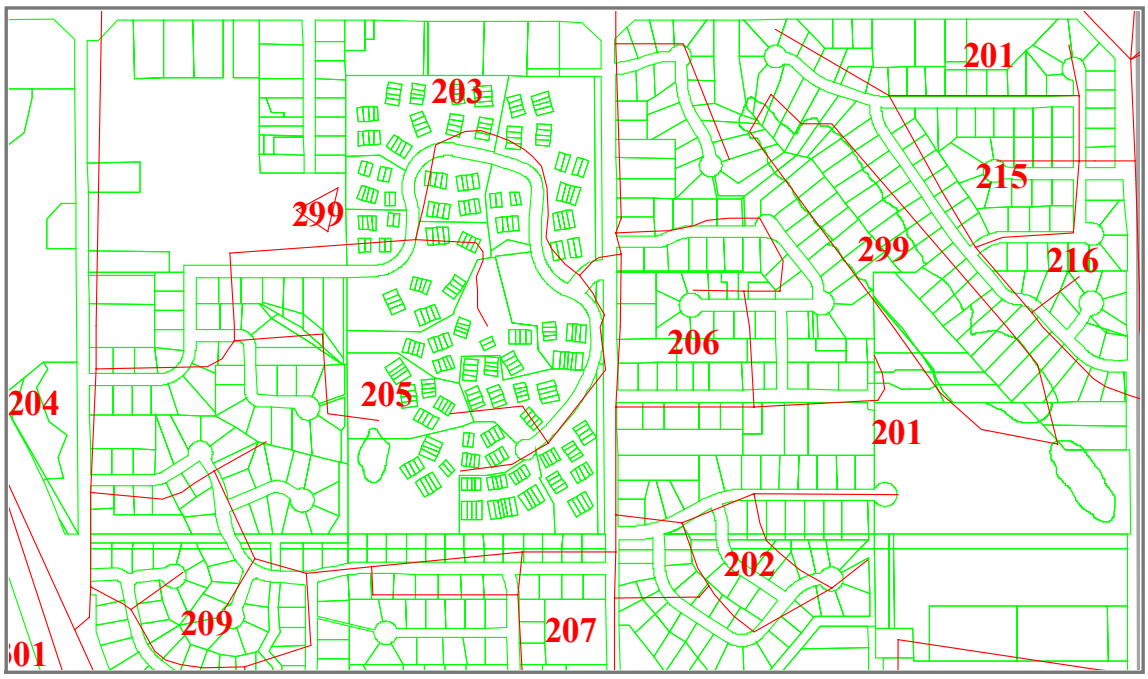
- **Automated procedures save time**. Automated procedures can be developed which will reduce the time local staff spend responding to Census Bureau requests for local input. Census Bureau requests often have short timelines making quick response critical. Requested information will be delivered quicker and with less effort than in the past.

- **Mid-decade estimates will improve**. Aligning census geography to local geographic data will make it possible to effectively use new parcel and land use information to estimate population and demographic change.

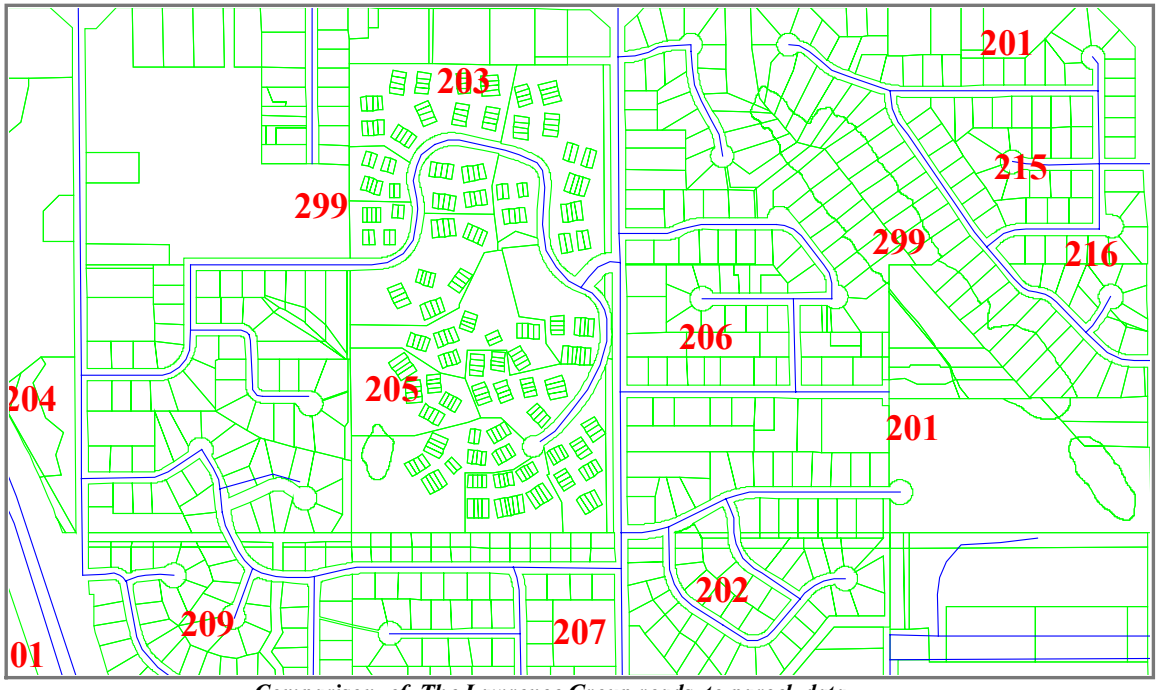
- **Accurate local geography lays groundwork for TIGER improvements.** An essential principal of the NSDI is to make local data available at the national level. By building census geography that matches locally developed and maintained geography, the foundation is built which will allow GIS information to flow from local government to the federal government.

Matching Census Boundaries to Local Parcel Information

City of Arden Hills



Comparison of TIGER to parcel data



Comparison of The Lawrence Group roads to parcel data

1998 Ramsey County Parcels

1999 Lawrence Group Roads

1990 U.S. Census TIGER

101 1990 Census Block Number

MetroGIS: Benefits

State: Minnesota's Department of Children, Families & Learning

The Organization: Food and Nutrition Service is a division within the State of Minnesota's Department of Children, Families & Learning.

The Issue: The Department of Children, Families and Learning (MnCFL) is responsible for determining eligibility for family child care providers participating in the Child and Adult Care Food Program (CACFP) in Minnesota. More than 40 million federal dollars are dispersed annually to over 15,000 providers located throughout the state who are administered by 11 sponsoring organizations.

Approximately 7,500 providers are located in Twin Cities metropolitan area. Geography is the basis for Tier I assistance. To be eligible, child care providers must be located in an area where at least half of the children are eligible for free and reduced price school meals, based on school data or 1990 U.S. Census Bureau data. Accurate locations of the child care providers had to be determined and referenced by geographic coordinates before eligibility could be resolved. This process was undertaken by the State of Minnesota's Land Management Information Center (LMIC).

In the Past: Prior to the availability of The Lawrence Group (TLG) data, geo-locating child care providers in the Twin Cities area was accomplished using address matching functions with the U.S. Census Bureau's TIGER street data. The process was typically only 65% successful, even less so in the high-growth suburban areas. Unmatched addresses required either a site visit by the provider's sponsoring agency, at which time a GPS based coordinate was determined, or a telephone call to the provider by LMIC staff. In the latter case, staff would work with the provider while viewing a digital map to best determine their location. This was a time consuming process.

Today: Geo-locating child care providers using address matching processes and the TLG data is typically 95% successful, minimizing additional staff time. Furthermore, the location is usually more precise than a GPS (non-differential) reading. The quality of the location can be very important since eligibility for federal funds may vary from one side of the street to the other.

In the Future: In late 1999, sponsoring agencies will be able to determine Tier I eligibility for potential and existing providers within the Twin Cities area via a MnCFL web site currently under construction. The TLG data will be the backbone for this "on-line" address matching system.

Value:

- **Reduced Costs.** Because the TLG address base is more accurate and up-to-date than TIGER, improved address matching results reduce the staff time required to locate eligible child care providers.

- **Improved Locational Quality:** Providers can be geo-located more precisely with the TLG data thereby reducing errors in eligibility determination.

- **Faster Public Service:** Using the TLG data via MnCLF's web site will make the eligibility determination virtually instantaneous thereby improving the service child care providers receive from sponsoring organizations.

Elementary Attendance Area:
Minneapolis Special, SD No. 991

Sponsor ID: 8625536
Provider's Choice, Inc.

Sponsor's Provider ID: 6890

CACFP AREA ELIGIBILITY

JANE DOE

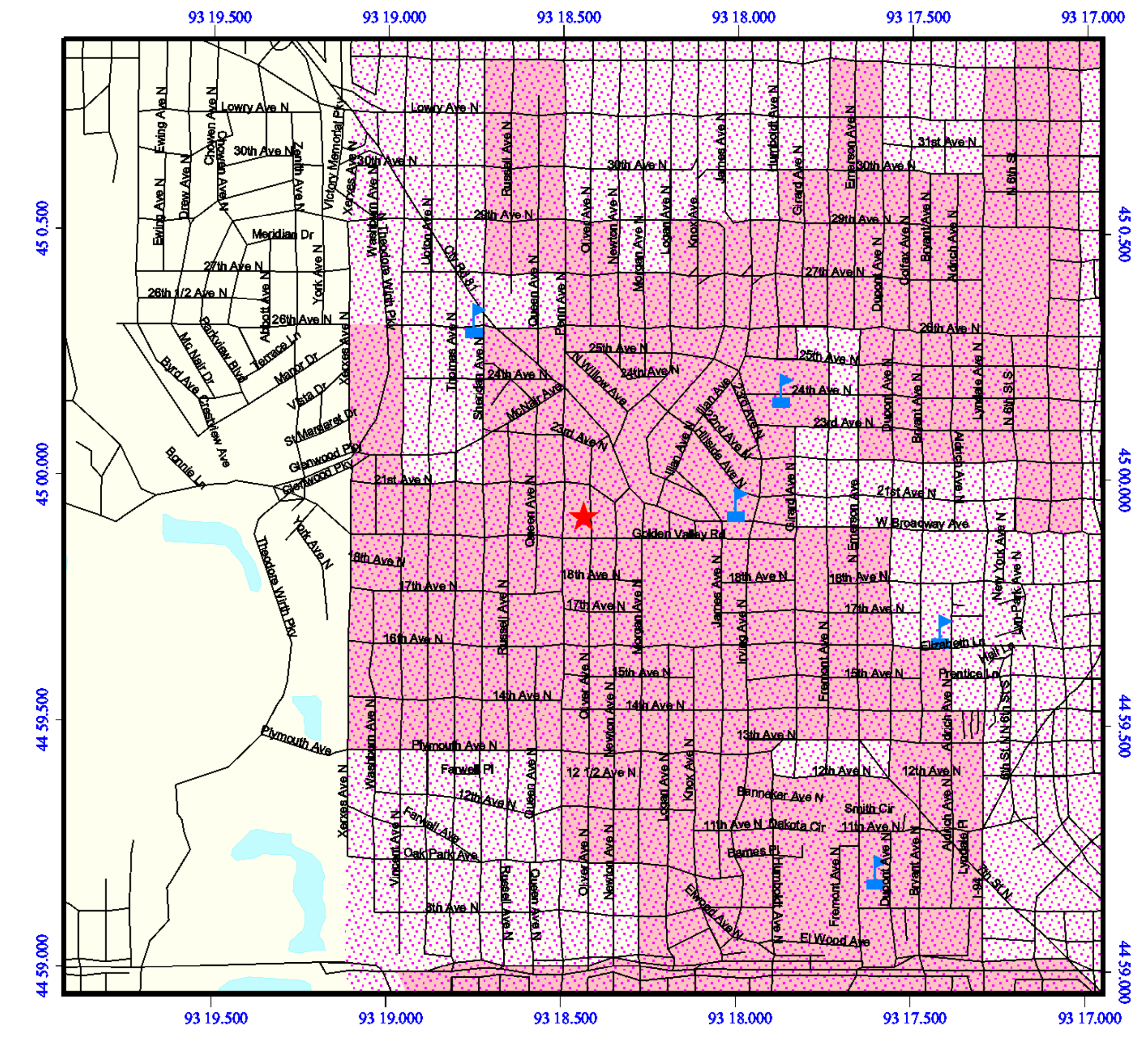
000 DRAFT AVENUE
MINNEAPOLIS, MN 55411

CFL Tier Eligibility: TIER I

Tier Determination Start Date: 1998

Provider Map Coordinates:
DM Lat: 45 00.359
DM Long: 93 18.306

This provider was located using GPS coordinates (+/- 25-100m)



Map Key

- Current Child Care Provider
- Other Providers Managed by this Sponsor
- Other Child Care Provider(s)
- Public Elementary School Building
- Eligible School District
- Eligible Elementary School Attendance Area
- US Census Eligible Block Group
- Road
- River
- County Boundary
- Lake

Map Disclaimer

The Minnesota Department of Children, Families and Learning (CFL) and the Land Management Information Center (LMIC) do not warrant the results you may obtain by using this map. This map is provided 'as is' without express or implied warranties, including warranties of merchantability and fitness. In no event will CFL or LMIC be liable for any consequential, incidental or special damages, including any lost profits or lost savings, even if a CFL or LMIC representative has been advised of the possibility of such damages or any claim by any third party.

HENNEPIN COUNTY, MN

MINNESOTA DEPARTMENT OF Children Families & Learning

0.25 0 0.25 0.5 0.75 Kilometers

0.1 0 0.1 0.2 0.3 0.4 0.5 0.6 Miles

Prepared for the Department of Children, Families and Learning by the Minnesota Office of Strategic and Long Range Planning, Land Management Information Center. Based on SY1998-99 MDCFL and school district information.

Map updated on: 1998
g:\lmic\cflfdc\cflfdc1\CD_maps\PCI_JANE.EPS

Map No. 1

MetroGIS: Benefits

Regional: Metropolitan Council

The Organization: The Metropolitan Council conducts long-range planning in coordination with local units of government and other organizations to guide growth and development in the Minneapolis and St. Paul metropolitan region. The Council also operates the regional transit service (Metro Transit), wastewater collection and treatment services, and the metropolitan housing and redevelopment authority.

The Issue: A proposed site for a new State Motor Pool and Metro Transit garage facility has been identified on the east side of downtown St. Paul. An environmental assessment work sheet (EAW) must be completed to determine the impact of this proposal. Using the most current and accurate information for this process is critical to a full and complete discussion of the issues the garage presents.

In the Past. Little digital information was available in the past. Producing maps which showed the location of utility services, roadways, neighborhood boundaries and environmental features required manual drafting of individual maps. This became especially complex when those features needed to be combined on one map.

Today. The Council requested relevant GIS information from the City of St. Paul. The information included digital ortho imagery produced cooperatively by the Capital Architecture and Planning Board and the City of St. Paul. This imagery was created using aerial photographs from the first cooperative project undertaken by the MetroGIS initiative.

In the Future. Additional information such as local utility network and detailed street rights-of-way data will be available from the City of St. Paul as they complete additional GIS data and make it available to participants in MetroGIS.

Value.

- **Data Development Cost Savings**. The same data can be used by more than one organization. The original aerial photographs were shared with Ramsey County, which in turn shared the data with the City of St. Paul. The city cooperatively developed ortho imagery with the Capital Architecture and Planning Board and finally the imagery was shared with the Council for its EAW process. Four organizations have used the data each time adding value and increasing its usefulness to other organizations. A few thousand dollars extra would have been spent by each organization or they would have made due with less data. (Estimated Savings: $8,000)
- **Increased Data Quality**. The amount of detail visible in available data has been increased. Without MetroGIS, the Council would not have the high-resolution information available for the EAW. Descriptive information would be less precise both for use in the EAW process and for public presentation of the information. It would take longer to explain the location and characteristics of the proposed site in public hearings or require additional expense in preparing materials for the hearings. (Savings: 1/4 hour of public hearing time and/or $1,000 in extra graphic presentation costs).
- **Better Decision-Making.** As MetroGIS matures sharing data will become easier and each participant can focus on maintaining data critical to their mission. All MetroGIS participants benefit by easy access to high quality data produced by the organizations that know the data the best. Although detailed utility information was not available, the Council would have benefited from such data. The additional staff time needed to determine local utility alignments and impacts would have been avoided. The accuracy of that determination would also have been improved. (Estimated Savings: 8 hours of staff time. What is better decision-making worth?)

Which Image Would You Use for Decision Making?

Both of these images show the proposed site for a new combined State Motor Pool and Metro Transit bus garage. The above image is from 1991 USGS 20,000 foot aerial photography (DOQs). The image shown below is from a 1996 MetroGIS cooperative demonstration to collect aerial imagery at 5000 feet. Four organizations cooperated to produce the latter GIS product. None of the organizations paid for the entire effort, but all have access to the final product for decision making.

MetroGIS: Benefits

County: Hennepin International Trade Services

The Organization: Hennepin International Trade Services is an organization within Hennepin County government which provides services to businesses involved in international trade.

The Issue: A study of import and export businesses was conducted to determine ways in which Hennepin County can support the development of these businesses. While many of these businesses have headquarters in Hennepin County they frequently have facilities outside the county.

In the Past. Six months ago 88% of these businesses were located to within approximately one block of their true location. Accomplishing this task required more than 40 hours of staff time and the cooperation of Hennepin International Trade Services and the Metropolitan Council. Because of the lack of addressing data standards, incomplete data and competing priorities at the two organizations, the work was spread over more than one year.

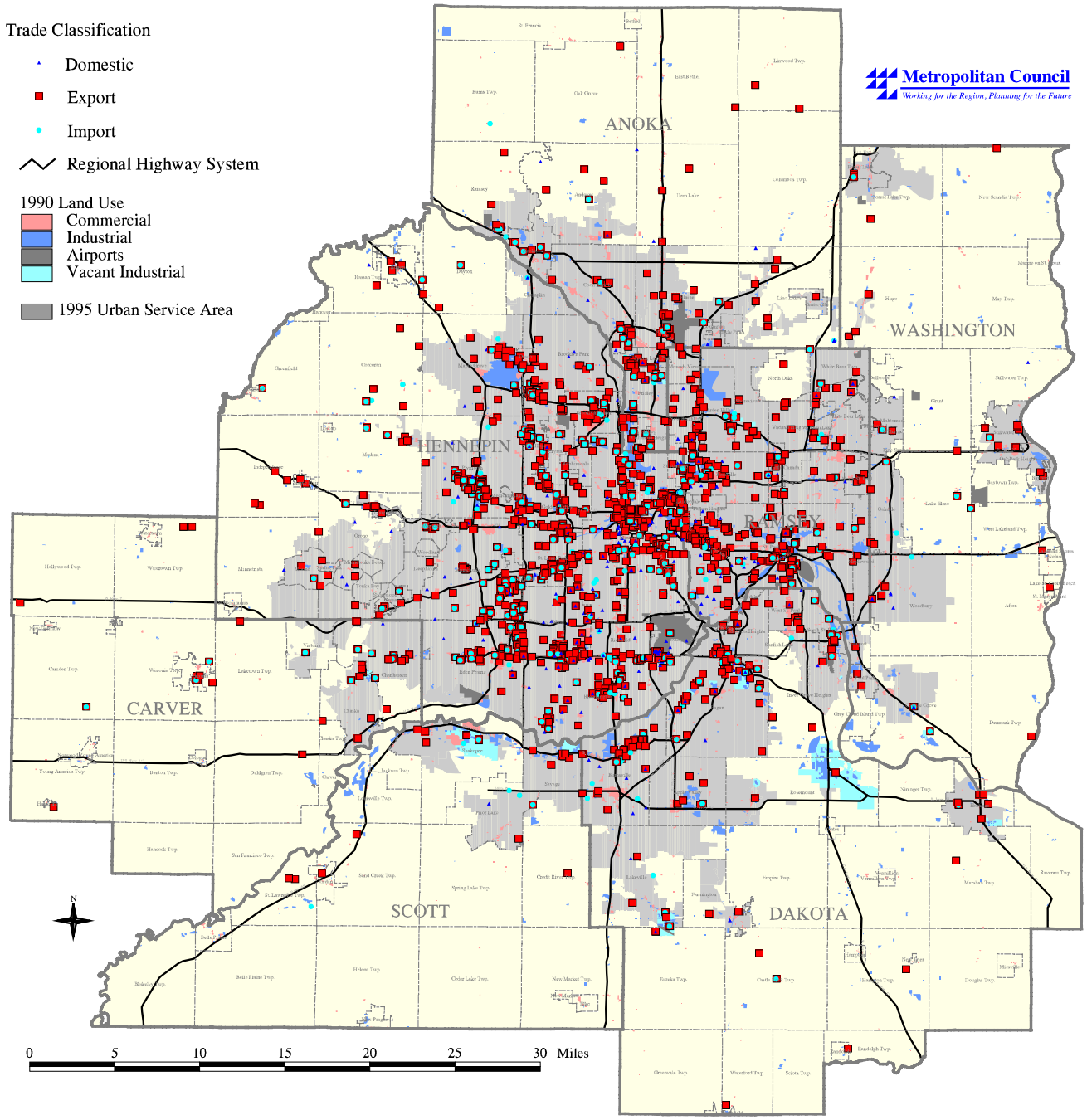
Today. With the use of TLG street centerline data made available through the MetroGIS initiative, the businesses can be located faster and with greater precision. The number of businesses which can be located with this process is the same or greater.

In the Future. Hennepin International Trade Services could produce a similar map in a few hours using addressing guidelines developed by the MetroGIS initiative and a future address matching application based on those guidelines. It would be possible for Hennepin International to regularly track import and export business development trends and assess the impact of their efforts.

Value.

- **Improved Data Completeness**. More import and export businesses can be mapped through an improved address matching process which uses TLG data and adheres to addressing guidelines. For example questions that could be answered more completely are: Where are all the medical equipment exporters located and what percentage of them are in Hennepin County?
- **Improved Data Quality**. The quality of information can be improved through the address matching process. As is often the case when data are first mapped in a GIS, some of the Hennepin International Trade Services data were incomplete. This became obvious when the first printed map did not show any importers or exporters in the eastern metro area. Corrections were made to the original data that improved the quality of the map and the data itself.
- **Reduced Staff Time**. Staff time required for locating import and export businesses will be reduced through access to region-wide street centerline data, standardized addressing specifications and shared address matching applications.
- **Increased Data Accuracy**. Improved precision means that the locational characteristics of import and export businesses can be more accurately described. A question that could be answered more accurately might be: Near what urban services and commercial and industrial establishments are electronic component assemblers located?
- **Increased Timeliness**. Shared data access, standards and applications also decrease project development time. By using data standards and applications that are meant to work together, Hennepin International would experience fewer delays due to process development time. By using shared data, standards and applications, Hennepin International would no longer be dependent on another organization to complete priority work.
- **Reduced Consultant Costs**. Hiring consultants becomes less costly when the consultants are familiar with MetroGIS data, standards and applications. The consultants can spend less time writing applications, developing data and organizing projects and more time producing desired results.

Twin Cities Metropolitan Area
Locations of International Trading Companies
Headquartered in Hennepin County



The original data table, containing business names, addresses and five-digit zip codes, was processed using postal coding software which assigned nine-digit zip codes to records for which adequate addresses were available. The resulting data file was then geocoded to the Metropolitan Council's "Zip+4" coverage using the ArcView 3.0 geocoding process. This resulted in an 88% match rate, or, geographically correct placement of 2,932 of 3,334 records.

MetroGIS: Benefits

Cities: Minneapolis Public Works Department

The Organization: The Minneapolis Public Works Department (MPWD) creates comprehensive engineering plans for all capital improvement projects, including: street, sewer, water and traffic improvements and coordinates GIS mapping for all City of Minneapolis departments. To perform these functions the MPWD builds, maintains and distributes comprehensive property, planimetric, topographic, utility, and digital ortho photography mapping databases within the corporate limits of Minneapolis.

The Issue: The MPWD only maintains engineering and GIS mapping data within the corporate limits of Minneapolis. However, many capital improvement projects and GIS requests extend beyond the City's corporate limits. A recent request for engineering and GIS mapping on University Avenue at the Minneapolis/St. Paul border illustrates the potential of MetroGIS.

In the Past: Prior to MetroGIS, similar requests were either overlooked or painstakingly completed.

Not only does the border between Minneapolis and St Paul separate two cities but it is also the border between Hennepin and Ramsey counties. Each of these four agencies has a unique GIS system, with distinct maps stored in different coordinate projections. In addition, capital improvement projects involve non-public utility companies, such as Northern States Power Company, the local electric utility, which also have data stored in a unique system.

Creating capital improvement maps beyond the corporate limits of Minneapolis was an arduous task for MPWD. It included finding the proper contact at each agency, who would extract the electronic map, and transmit it to MPWD. Then GIS technicians would convert the map to the local coordinate system and symbol nomenclature, and combine it with MPWD maps.

In General, only the highest priority projects warranted this kind of effort.

Today: The task is made simpler with the beginnings of MetroGIS in place. Certain map data sets, like the road centerline and municipal boundary files, are available via MetroGIS and are already loaded on the MPWD system. Agreements are also in place to make additional datasets available to all MetroGIS users. These map databases include property parcels, planimetric and digital ortho photography.

Working relationships built within MetroGIS have also helped MPWD identify the key data stewards in communities adjacent to Minneapolis.

In the Future: The value to all MetroGIS participants will increase exponentially with access to GIS data sets from multiple agencies. For example, data sets from multiple agencies were used to create this powerful yet sublime map. It not only shows what can be done with a mature MetroGIS central clearinghouse in place, it also shows what users will easily and quickly be able to do from their desktop.

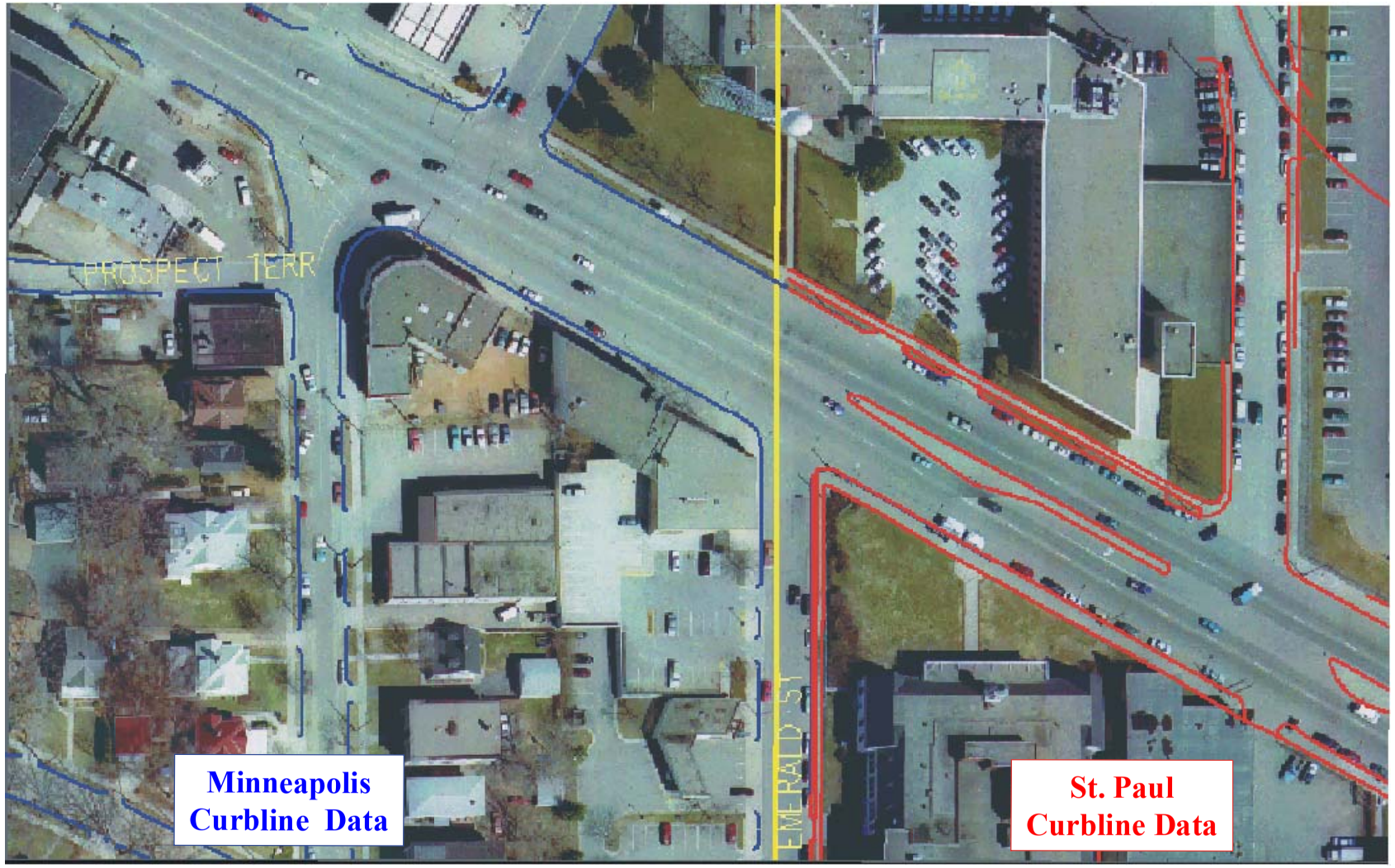
Value:

- **Quick Turnaround**: With the central MetroGIS map clearinghouse available, it will be possible to create complex engineering and GIS maps that extend beyond Minneapolis limits in hours instead of days or weeks, which was the case without MetroGIS.

- **Reduced Costs**: Less handwork with quicker turnaround will translate into less cost.

- **Accurate and Current Data**: By sharing GIS data through MetroGIS, agencies that originate the data can easily share the best available information with others. A good example is the TLG road centerline data set that is available to MetroGIS participants. After the TLG data was initially loaded into the MPWD GIS system, the Minneapolis portion was compared against more accurate Minneapolis data. The corrections were sent to the data vendor and quickly implemented on the original TLG data. An updated TLG road centerline data set was returned to Minneapolis and loaded into their system. At the same time, the updated TLG data was available to all MetroGIS users.

Multiple County Planimetric Fit



The separate Minneapolis and St. Paul planimetric data files match at the common city boundary.

MetroGIS: Benefits

School Districts: Lakeville

The Organization: Lakeville School District serves 11 individual schools in the counties of Dakota and Scott. Lakeville is a rapidly growing outer-ring suburb in the metropolitan area. The number of students being served by the school district is also growing as a result of the population increase.

The Issue: Decisions about where to locate new school facilities, programs, and school boundaries need to be made to meet changing student population distributions.

In the Past. Before MetroGIS, school siting decisions in Lakeville were made without the benefit of GIS data. Sites were analyzed for suitability. However, without access to GIS information about parcels, it was impossible for the school district to map the residence of pre-school age children relative to the potential new school sites.

Today. Through the MetroGIS agreements, parcel data from Dakota County has been provided to the Lakeville school district. Scott County is expected to provide parcel data to the school district soon. The district will be able to analyze the distributions and concentrations of different age populations. Better decisions will be made about where to locate new facilities, where to target special programs and service delivery; and how to more efficiently route buses.

In the Future. As more and more data (such as the Street Centerline data set and socioeconomic data) become available through MetroGIS, Lakeville school district will continue to increase its ability to match the needs of families with resources.

Value.

- **Reduced Costs**. The Lakeville school district will benefit from MetroGIS in a number of ways. The GIS data sharing agreements have created conditions which allow districts to obtain GIS files from counties and cities at a fraction of the cost that would have been incurred if the district had developed that information itself. Lakeville wants to build a GIS but is in a municipality that does not have existing GIS centerline data. Use of the Lawrence street centerline data through the MetroGIS initiative has added a valuable data set to Lakeville School Districts GIS.

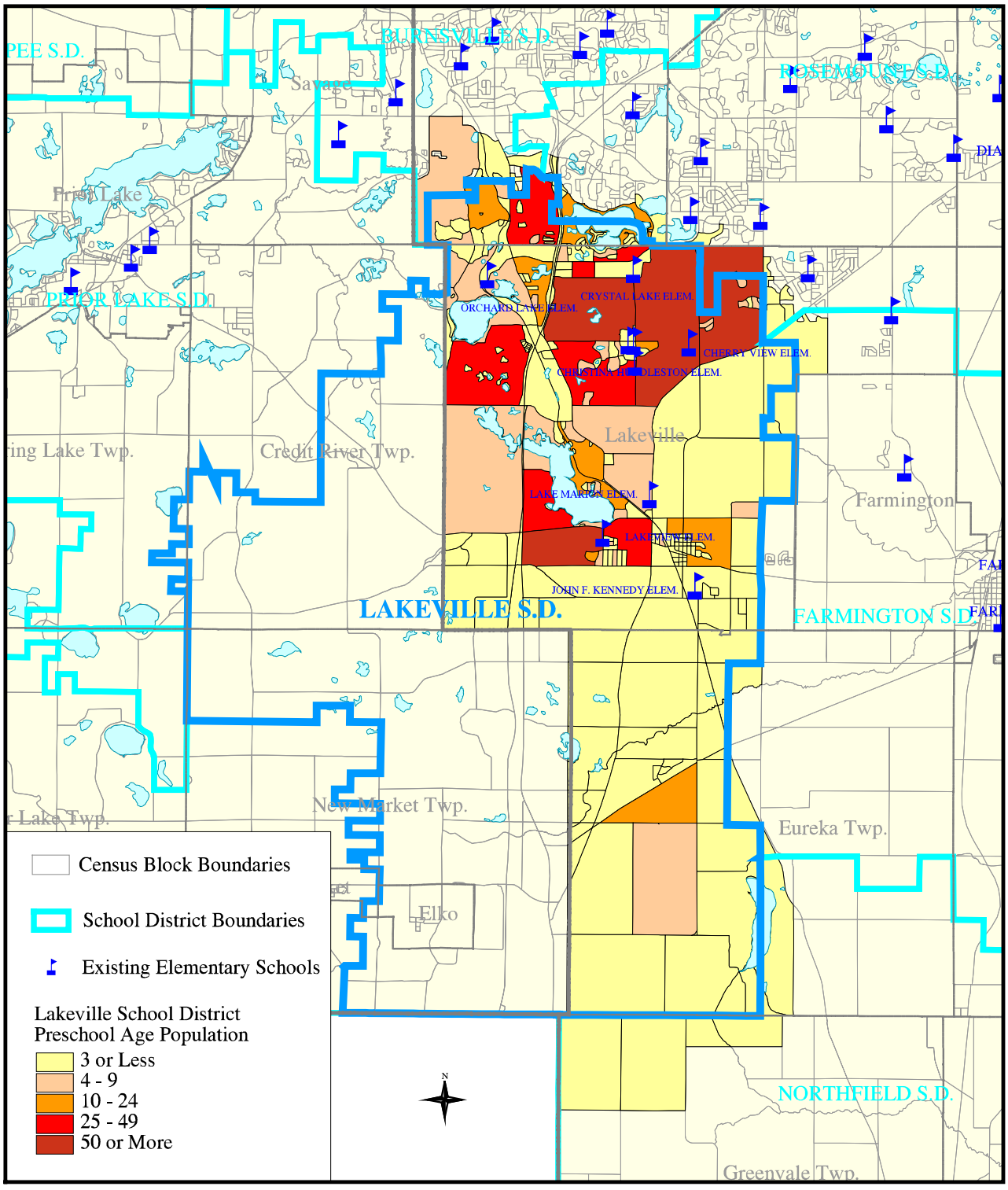
- **Common Language**. Another less obvious benefit to Lakeville School District is that GIS is a common language that all units of government can use. By promoting this common language the MetroGIS effort has also facilitated greater communication between school districts, cities and counties.

- **More Accurate, Current Information.** Through the use of county parcel databases, The Lawrence Group street centerline data set, and other data available through MetroGIS, the Lakeville School District will be able to base decisions on the most current, accurate information available.

- **Identifying local unique characteristics and needs.** Development of a GIS using MetroGIS resources will allow Lakeville School District access to information specific to their geographic area. Local unique characteristics and needs can be more readily available than is possible with less specific data.

1997 Distribution of Preschool Age Population in the Dakota County* Portion of the Lakeville School District

Summarized by 1990 Census Block



* Scott County data delivery is pending.

Data Sources: Lakeville School District; Dakota County; the U.S. Census Bureau; The Lawrence Group; Metropolitan Council

Metropolitan Council
Working for the Region, Planning for the Future

MetroGIS: Benefits

Watershed Districts: Ramsey Washington Metro

The Organization: The Ramsey Washington Metro Watershed District which straddles the boundary between Ramsey and Washington Counties is charged with managing water resources through regulations and construction projects.

The Issue: The Ramsey Washington Metro Watershed District advocates the sealing of abandoned wells to help preserve the quality of the region's ground water. Critical areas for sealing abandoned wells have been identified. However, determining which wells are within the critical areas is a complex task best completed with the use of a GIS and data available from other government agencies.

In the Past. Previously, the process of determining whether a well is in a critical area involved using paper maps and information about the nearest street intersection. County parcel maps have improved the watershed district's ability to accurately locate wells, but often well owners do not have enough information to locate the well. (E.g. property identification number).

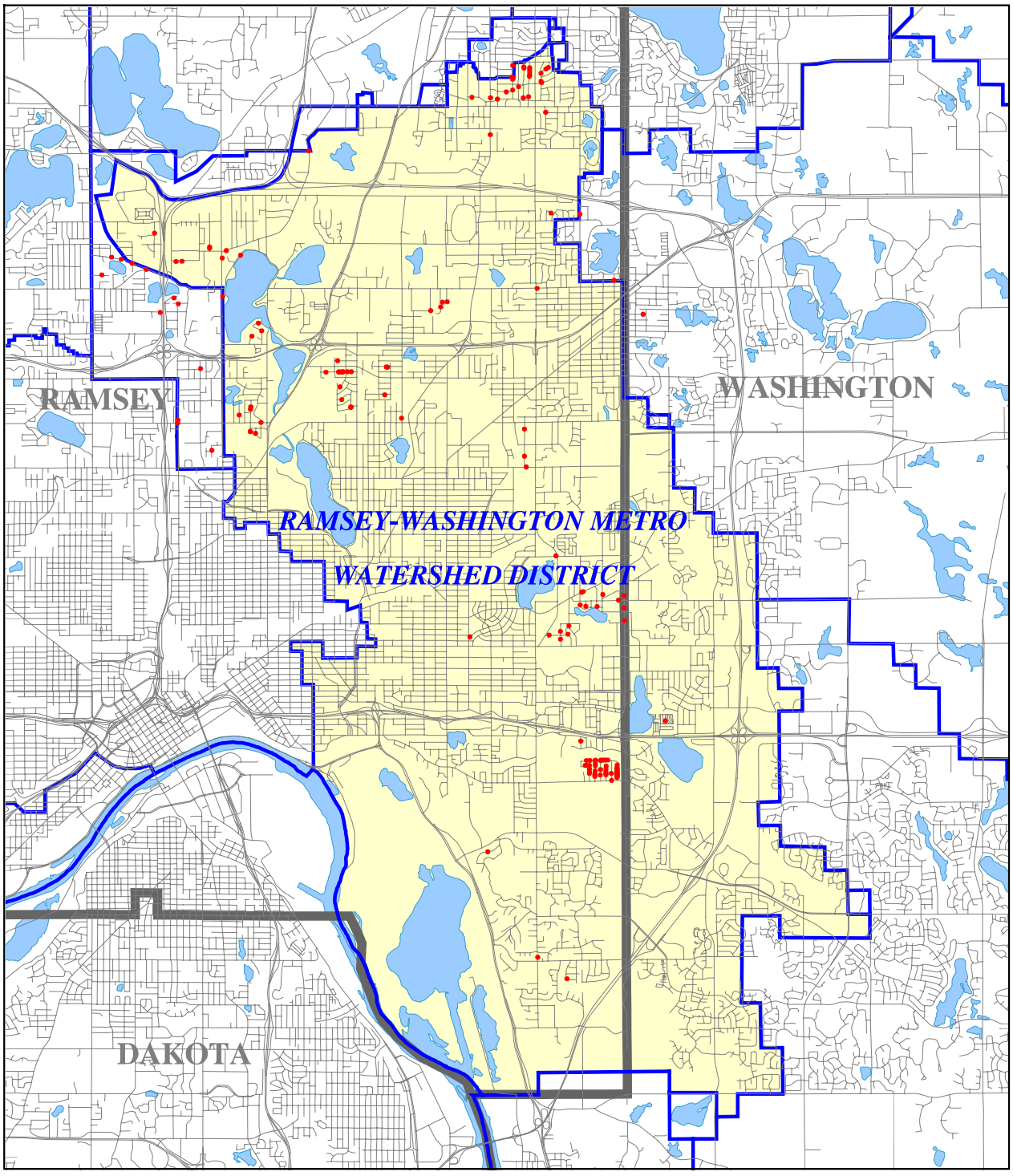
Today. The use of county parcel GIS data through MetroGIS data sharing has improved the watershed district's ability to accurately locate wells. The availability of street centerline data has provided another method for locating wells by using street addresses.

In the Future. Improving integration of street centerline and parcel data, establishing standards for sharing parcel data between counties and improving address information will all help improve the accuracy with which abandoned wells can be located.

Value.

- **Faster Public Service**. The use of both county parcel data and street centerline data increases the effectiveness of watershed district staff in determining a well location when a well owner calls in to inquire about eligibility for the well abandonment program. Staff time is reduced and citizens are satisfied with the service they receive.
- **Reduced Programming Costs**. It will eventually become possible through the MetroGIS initiative, to translate county parcel attribute data into a region-wide standard. This will increase the value of parcel data in well abandonment programs throughout the region, because the same computer programs can be shared between watershed districts. One well abandonment application can be written and shared among all interested watershed management organizations. (One program serves 10 organizations.)

Ramsey-Washington Metro Watershed District



The Ramsey-Washington Metro Watershed District straddles the boundary of Ramsey and Washington Counties. The well symbols represent wells which have been properly abandoned through the Watershed Districts well abandonment program.

DATA SOURCES: Ramsey-Washington Metro Watershed District; Ramsey County; Washington County; The Lawrence Group; Metropolitan Council