Neighborhood Planning and GIS: Case Studies from the Minneapolis Neighborhood Information System

by Jeffrey K. Matson

This article is the second in a three-part series on the Minneapolis Neighborhood Information System (MNIS), a community-focused capacity-building project that assists neighborhood organizations in acquiring data, geographic information systems (GIS) analysis, and mapping capability to meet their revitalization goals. The first article, which appeared in the Spring 2004 issue of the CURA Reporter, discussed the history and background of MNIS, as well as the goals and overall achievements of the project to date. This article takes an in-depth look at three of the participating neighborhood organizations and focuses on how they have made use of MNIS data and technical support to bring GIS technology into their workplaces. A closer look at the membership requirements, data available to MNIS members, and training methods used will also be discussed.

MNIS Membership
Since the inception of the program, MNIS membership has increased from 6 to 12 community organizations representing a total of 17 neighborhoods (Figure 1). To encourage active participation in MNIS and to meet the stipulation of the federal research grant that funds the project, MNIS neighborhoods must agree to a set of annual membership requirements. These include the following:

- Neighborhood boards must approve membership and sign a formal letter of acceptance naming a primary and alternate MNIS representative.
- The organization must agree to MNIS’ Acceptable Use Policy.
- The organization must pay dues of $250 annually (charter members exempt through 2004).
- Staff representatives are expected to attend informational meetings and trainings to become proficient in the use of GIS.
- Neighborhoods must complete one map, GIS project, or database each quarter.
- Neighborhoods must submit quarterly usage reports detailing MNIS use in their organization.

Generally participating organizations have reacted favorably to these requirements because they keep the organization engaged in the project and provide a means to incorporate GIS into the organization’s regular activities.

MNIS Data
The MNIS program is founded on the principle that neighborhood organizations should have access to reliable and current data about their residents and neighborhoods. Although data provided by the City of Minneapolis are central to the program, participating members use a variety of data sets from a multitude of sources. Data used by neighborhoods range from City parcel information, U.S. Census demographic information, and GIS base layers such as roads and waterways to regional transportation and recreational amenities information, natural resources data, and primary data collected by neighborhood organizations.

City of Minneapolis Data. The City of Minneapolis Business Information Systems (BIS) department aggregates data from multiple City offices and agencies to create the MNIS data set. Hennepin County Tax Assessor information—as well as Minneapolis Department of Planning and Zoning, Housing Inspections Office, and utility billing data—are available to participating MNIS organizations. Each property in the city is assigned a variety of attributes that can be mapped: ownership and address information, tax status, housing condition, zoning district, permits issued, etc. Neighborhoods use these data to create mailing lists, identify areas to target resources, verify planning and zoning classifications, and analyze Neighborhood Revitalization Program (NRP) investments.
**U.S. Census Data.** The 2000 U.S. Census provides an incredible amount of demographic information, much of which is vital to the work of neighborhood organizations. Many community organizations are interested in finding answers to simple questions such as the ethnic and racial makeup of their neighborhoods or how community demographics have changed over time. More complex questions and relationships also can be addressed using U.S. Census data—for example, the relationship between homeownership and poverty in a particular neighborhood or community. Data from the U.S. Census are perfectly suited to GIS and mapping applications and can be used to isolate variations within a neighborhood or show how a particular community compares with neighboring communities. Currently MNIS provides U.S. Census data down to the block level for participating members, and MNIS has recently been working to provide neighborhood-level profiles of basic demographic, social, economic, and housing characteristics. Census data are available from a number of sources.

**Neighborhood Data.** Some of the most valuable MNIS data come directly from the neighborhood organizations themselves. Primary data collected by staff and volunteers who have local expertise and intimate knowledge of their community adds value to any data set. Neighborhoods have created data for programs such as NRP activities, block club membership, community garden planning, and invasive species removal projects. Because neighborhood staff are on the front lines of community planning, they are able to identify and intervene on problem properties, work with developers and consultants on new housing and commercial properties, and coordinate with health and human services agencies when relocating or establishing community facilities.

**MNIS Training**
The vital elements in GIS and MNIS are the users themselves and the training that is provided so users can work successfully with a geographic information system. The typical MNIS user is a neighborhood organization staff person, not a GIS specialist. The goal of the program is for neighborhood staff to learn to use the available software and data sets to create maps and databases without needing to rely on an outside expert. Learning about GIS and MNIS through systematic training sessions is essential for participants to be able to use the system to its full potential and contribute to the MNIS collaboration. Staff at MNIS provide ongoing quarterly training sessions for neighborhood staff and volunteers, nonprofit community-based organizations, and City of Minneapolis staff working on the MNIS project. Training sessions involve project-based learning and focus on the tools that are most applicable to the business of a neighborhood organization. Periodically, scholarships are made available to neighborhood staff to enroll in GIS courses at the University of Minnesota.

The MNIS approach to training neighborhood staff includes three facets: getting access to and becoming familiar with data; practical applications of layouts, images, and maps; and learning to use GIS software. The program offers training and support in using City of Minneapolis, U.S. Census, crime, school district, and other types of data. With more than 20 attributes assigned to each parcel, becoming familiar with the MNIS data does take time. Neighborhood staff are kept abreast of updates and changes to the data, as well as new features on the interactive MNIS Web site. Before the MNIS data download Web site was launched, City data were distributed via MNIS staff. With the debut of the City’s MNIS Web site, MNIS users are now able to access data anytime.

Neighborhood staff use maps to communicate with a variety of stakeholders. Maps are used in neighborhood board and committee meetings, presentations to the City, and grant proposals. Through MNIS trainings, neighborhood staff learn how to create effective layouts, how to incorporate maps into written materials, and what types of media can be used to present maps.
From simple poster boards or flyers to sophisticated PowerPoint presentations, neighborhoods use maps in many different formats.

Neighborhood participants are exposed to GIS computer software and become familiar with the data through training sessions and one-on-one visits with MNIS staff. Training programs range from beginning level to advanced and are focused on what MNIS users want to learn (based on feedback and evaluations at earlier training sessions). The MNIS staff regularly visits neighborhoods to help with projects onsite using GIS software.

The remainder of this article consists of case studies of three MNIS participants: Longfellow Community Council, Hawthorne Area Community Council, and Northside Residents Redevelopment Council. For each participant profiled, we discuss several representative MNIS projects and the impacts of these projects on neighborhood revitalization.

Case Study 1: Longfellow Community Council
The Longfellow Community Council (LCC) was a charter member of the Minneapolis Neighborhood Early Warning System (MNEWS), the precursor to MNIS, and was one of six Minneapolis neighborhoods to divert into the MNIS program in 1999 NRP funds slated for housing demolition programs. The LCC board and executive directors have been long-standing supporters of MNIS. In addition, LCC has encouraged all staff, interns, and any interested volunteers to participate in MNIS trainings and to use GIS for support of their work within the organization. To date, LCC has completed GIS projects in the areas of housing, land-use planning, environmental studies, and demographics. Below are descriptions of several projects undertaken by LCC during the last few years.

**Project 1—Lead Exposure Risk.** Working with MNIS, the Longfellow Community Council developed a set of criteria to identify properties in the neighborhood that might be at risk of lead exposure due to lead-based paint in the home or lead pollutants in the air. The Longfellow neighborhood, like most residential neighborhoods in Minneapolis, has a high percentage of homes built before 1950, as well as many old industrial properties and several high-traffic transportation corridors. These are just some of the factors that increase lead exposure risk in children. The Longfellow community used four indicators to map the risk of lead exposure, including concentrations of children in the neighborhood, building condition, age of housing, and proximity to transportation corridors. Data for the project were obtained from the U.S. Census Bureau and the City of Minneapolis.

Properties were assigned a risk score based on: the number of indicators present and the severity of those indicators. For example, a property that had a below-average building condition rating, was built before 1950, and was on a block that had more than 11% school-aged children received a score of 5 (high risk). Using a GIS software program called ArcView, the results for each parcel in the Longfellow community were mapped to show areas of high, moderate, low, and minimal lead exposure risk in the neighborhood (Figure 2).
As additional data become available—for instance public health data—the risk scores may be revised or updated. Having identified patterns of risk in the Longfellow community, LCC staff are now able to target outreach and educational efforts to inform residents in high-risk areas about the dangers of lead exposure in children and the warning signs for lead poisoning. Additional information about lead exposure and the project results will also be published in a future edition of the Longfellow View, a neighborhood publication that is mailed to all residents.

**Project 2—Neighborhood Housing Program Analysis.** The Longfellow Community Council has made literally hundreds of grants and loans to neighborhood residents and businesses—from small grants for basic home maintenance to large commercial remodeling loans—during the last 10 years. The goal of these programs is to maintain the quality of existing housing stock and provide opportunities for small businesses that can serve the needs of residents. The Longfellow Neighborhood Housing Program Analysis project was a simple exercise in creating a database of program activity and a set of maps showing the distribution and amount of dollars funneled to the community.

This project provides an excellent example of primary data collection and archiving of neighborhood-based information. From a series of spreadsheets and paper records, the data were imported into a Microsoft Access database where the tables were joined with other housing data, namely parcel records from the City of Minneapolis. These data were then geocoded by address to a parcel map of the neighborhood using ArcView GIS software. Geocoding is the process by which a list of geographic features (in this case, property addresses) is indexed against a base map and turned into points on the map (see Figure 3). The geocoding process also retains any attribute data related to each address—such as loan or grant type and amount—which in turn can be displayed on the map.

There were several important outcomes to the Longfellow Neighborhood Housing Program Analysis. First, no City of Minneapolis agency is charged with collecting this type of data. By helping LCC to collect and archive this type of data, the project increased the capacity of the organization to maintain its own records of housing program activity. Second, the maps that were produced as part of the project can be used for neighborhood meetings, fundraising opportunities, and other community forums to highlight the coverage of LCC programs and to illustrate the equitable distribution of funding in the community. Finally, the basic housing program data can be combined with City of Minneapolis parcel data on
homeownership, property value, or building condition to allow further analysis of the effectiveness of such programs on the housing stock in Longfellow and to help with planning for future investment in the neighborhood.

Case Study 2: Hawthorne Area Community Council
The Hawthorne Area Community Council (HACC) is one of the founding members of MNIS and has continued to support the efforts of the program despite staffing changes within the organization. Through the years, HACC has taken full advantage of the resources MNIS has to offer by attending trainings to develop internal GIS capacity and by working directly with CURA-supported graduate and undergraduate student research assistants on GIS-related projects. To date, HACC has completed projects on housing and land use, economic development, and neighborhood asset mapping, and has worked collaboratively with other neighborhood organizations in the city. Several of these projects are discussed below.

Project 1—Vacant Lots and New Construction Mapping. At one time, Hawthorne was home to the highest number of vacant lots per neighborhood in the city of Minneapolis. Additionally, there was a significant problem with boarded-up units in the neighborhood. The neighborhood decided to address the problem of vacant and abandoned lots by facilitating new home construction in the neighborhood. To date, more than half of the new homes have been completed.

Working with several CURA-supported students from the University of Minnesota, HACC then attempted to assess the impact the new homes had on the community. This included a spatial assessment of where new construction was occurring and where opportunities for redevelopment remained in the neighborhood. Using GIS software and data from the City of Minneapolis, the Minneapolis Community Development Agency, and HACC, a series of maps was created showing the existence of vacant lots, boarded buildings, and new construction in the neighborhood over time (Figure 4). Although many vacant lots remain in the neighborhood, the maps show a redevelopment “domino effect.” Owners of vacant lots tend to hold onto these properties until after construction of new homes, hopeful that it will result in higher prices. The results of this project will be used as an evaluation tool for future redevelopment policy and funding decisions.

Project 2—Zoning Disposition Project. In early 2003, the Minneapolis Community Development Agency (MCDA) proposed a change to its lot disposition policy that appeared to affect only a handful of the neighborhoods in Minneapolis and that limited the neighborhoods’ input in the decision-making process. Part of the city’s zoning ordinance, the lot disposition policy dictates the manner in which the city redevelops vacant lots that are owned by the MCDA. The proposed policy change was a response to the need for more affordable housing units throughout Minneapolis and would have allowed for both redevelopment of vacant lots previously deemed too small for building and an increase in residential density in some areas of the city. A group of neighborhood organizations, led by the Hawthorne Area Community Council, was concerned about these changes because many of these lots are in already high-density areas with low relative property values.

The Hawthorne Area Community Council sought to demonstrate the impact of the policy changes on affected neighborhoods through the use of demographic, crime, and housing data. Working with MNIS staff, HACC initiated the Zoning Disposition Project, which had several objectives:

- improve communication between communities impacted by the MCDA policy changes
- give communities a say in the neighborhood development process
- get MCDA commissioners to meet with residents of affected communities
- stop the proposed changes to the lot disposition policy

This project involves incorporating data from the U.S. Census Bureau, the City of Minneapolis, and the MCDA into various charts and maps to show the characteristics of the impacted neighborhoods and how they compare with neighborhoods in the rest of the city. To date, demographic analysis has been completed and many of the maps have been created. Several presentations on the topic have been given, including one to the Minneapolis City Council.

Although the project is still ongoing, results thus far have been encouraging.
One immediate impact of the project was to show city officials that the neighborhoods most impacted by the proposed policy change were areas with high minority populations, high crime rates, high poverty rates, and little park or recreational land (Figure 5). As a result, the density portion of the zoning change was tabled for further discussion and the organizations involved have continued to work with City officials on a viable solution. This project represents a model of collaboration that MNIS seeks to encourage among its members. Staff at HACC brought together many neighborhood organizations—several of which were not previously members of MNIS—to form a broad and effective coalition. It is the hope of HACC and the other organizations involved in the project that their collaborative efforts will not cease once the disposition policy issue is resolved, but will instead lead to ongoing partnerships around issues of common interest.

**Case Study 3: Northside Residents Redevelopment Council**

The Northside Residents Redevelopment Council (NRRC) has been a member of MNIS since early 2002. The MNIS representative from NRRC has a background in geography and GIS, and consequently the organization has been one of the more active MNIS participants in recent months. Since joining MNIS, NRRC has completed several small projects on housing and land-use planning that directly relate to issues facing the neighborhood. It is common for NRRC to work with MNIS staff to create poster-sized maps for community meetings that help to convey information in a clear and understandable manner and keep residents better informed. In addition, MNIS facilitated a collaboration between NRRC staff and a group of University of Minnesota graduate students enrolled in a GIS course to undertake an evaluation of the housing programs NRRC has participated in during the last 10 years. Several NRRC projects are discussed below.

**Project 1—Land-Use Planning.** A basic use of GIS software is simply as a tool to help people better see what is going on around them. For a land-use planning project, NRRC staff created two maps to highlight areas of potential redevelopment in the neighborhood. In one of these areas, located along Plymouth Avenue, NRRC plans to rehabilitate the Homewood Apartments and develop several sites owned by the Minneapolis Community Development Agency and NRRC (Figure 6).

The maps NRRC created have been used at numerous neighborhood and city planning meetings to inform residents, planning agencies, private developers, and city staff of the vision the neighborhood has for these areas. The maps also have helped residents better understand long-range land-use planning issues faced by the neighborhood. The result has been neighborhood board approval of an application for hundreds of thousands of dollars in affordable housing funds from the Neighborhood Revitalization Program’s (NRP) affordable housing trust fund. The proposals for affordable housing funds have gone to the NRP Policy Board and the organization is awaiting a decision for final approval.

**Project 2—Neighborhood Revitalization Program Housing Analysis.** In the spring of 2004, NRRC staff teamed up with a group of University of Minnesota students enrolled in an Urban GIS course on a project designed to analyze NRRC’s Neighborhood Revitalization Program (NRP) Phase I housing programs. The objective was to produce maps that would summarize the accomplishments of the NRP Phase I programs during the last 10 years (Figure 7) and provide a visual aid
The data used in the project came from seven different sources and thus required a significant amount of processing and analysis to convert all of the information to a common format. Once the data were suitable for GIS analysis and the geocoding process was complete, the variables that were requested by NRRC were aggregated in total units or total investment at the block and zone levels (zones are geographic units that were created by NRRC to evaluate and plan for the equitable distribution of NRP funding). Additional analysis was conducted to compare the difference in market value of the parcels between the beginning of NRP Phase I in 1993 and the end of the program in 2003. Finally, a series of maps was created, each depicting various investments or activities during NRP Phase I.

The maps show a relatively even distribution of housing units across the six NRRC zones. However, homeownership rates are far higher in the western Willard and Hay zones than in the eastern Near North zone. Given that NRRC’s largest NRP program, the Home Improvement Loan Program, provided home improvement loans to existing homeowners, it is no surprise the Willard-Hay communities—which have higher homeownership rates—received more funding than the Near North.

The connection between NRP housing investments and property values in the Near North neighborhood is less clear. It is likely that a loan made to a homeowner increased the value of that property; however it is impossible to tell whether or not neighboring properties enjoyed any “halo effect” from the investment.

Summary

The case studies of MNIS neighborhoods presented here show the diversity of projects undertaken by participating neighborhoods, as well as the important role GIS can play in the work of a community organization. In addition to describing selected MNIS projects, this article has also highlighted the MNIS training philosophy, the types of data that community organizations gain access to through MNIS, and the contributions members of MNIS are expected to make to the program.

We believe that the success of the Minneapolis Neighborhood Information System program to date has resulted from several factors. Most important is the community-driven nature of MNIS. Neighborhood groups were present and active during the design, development, and implementation of all aspects of the program, including data delivery, training, and GIS project development. As a result, community organizations have been able to realize both the potential and the importance...
The projects themselves stem from real neighborhood issues and all have been designed by neighborhood staff. Another key to success has been the collaborative nature of the program. Many of the project examples described here have shown how neighborhoods have partnered with other neighborhoods and the University of Minnesota to create more robust and wide-reaching projects.

The final article in this three-part series on MNIS will provide an evaluation of the program as required by the Department of Commerce’s National Telecommunications and Information Administration, which supplied major funding for MNIS. The evaluation will examine what has been accomplished through MNIS members’ use of GIS during the past three years, as well as the effects MNIS has had on member organizations. The future of MNIS and possible expansions of the program will also be discussed.

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The Fourth Annual Community GIS Exposition will be held November 10, 2004, at the Continuing Education and Conference Center (formerly the Earle Brown Center) on the University of Minnesota’s St. Paul campus. The theme of this year’s expo is “Empowering Communities to Undertake Grassroots Change.” The expo will showcase projects completed by members of the Minneapolis Neighborhood Information System (MNIS), the St. Paul GIS Consortium, and local government agencies, and is intended to build collaboration among GIS users in the Twin Cities metro area and to create and move forward a comprehensive GIS agenda for the region.

Sponsored by the Minneapolis Neighborhood Information System (MNIS), the St. Paul Community GIS Consortium, and CURA’s Neighborhood Planning for Community Revitalization (NPCR), the expo will include a poster session highlighting GIS projects; breakout sessions on ArcGIS and university and online GIS resources; and presentations on MNIS, the St. Paul GIS Consortium, and local government GIS applications.

More information about the expo, including how to register, will be available soon at www.cura.umn.edu.