

# MAPPING THE FUTURE OF COMMUNITY DEVELOPMENT WITH GIS

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Geographic Information Systems (GIS) is a computer mapping technology with the capacity to revolutionize community development through advanced data analysis. This article argues that when used effectively, GIS can better enable community-based organizations to achieve their missions of alleviating poverty and building strong communities. The author provides a brief overview of trends in community mapping, such as university/community partnerships, and covers several ways that GIS maps can be utilized in community development projects. The article then discusses challenges in using GIS in community mapping efforts, and offers several best practices and strategies for promoting successful community mapping efforts.

## INTRODUCTION

The “digital divide” is a technological disparity that separates population groups, but also exists between organizations. It can often be observed between the private and non-profit sectors, as well as between large and small non-profits. Most small community-based organizations have not fully embraced new technology and Internet resources, due to either high costs or a lack of understanding of the benefits. These technologies can offer efficient, low-cost solutions to community development organizations, such as enhanced recruiting capabilities and information distribution through Web sites, blogs, and RSS feeds. It is imperative for community-based organizations to close the technology gap in order to achieve crucial goals in poverty alleviation, community building, and asset creation.

A geographic information system (GIS) is a computer mapping program with the capacity to revolutionize community development. Originally a tool used by professional geographers, cartographers, and surveyors due to limited availability and high costs, collaborative partnerships and Web-based applications have made GIS more accessible and affordable for individuals and community-based organizations.

GIS programs have three main capabilities: mapmaking, geocoding, and spatial analysis.<sup>[1]</sup> Mapmaking can create a reference map that displays geographical information, or a thematic map, which illustrates a pattern of specific data. Geocoding refers to using spatial coordinates to plot specific geographic points. The most powerful capability of GIS software is spatial analysis, which can examine the interaction of variables such as ethnicity, age, or income in a specific location over time.<sup>[2]</sup>

This article argues that GIS is an invaluable tool for community development when used effectively. The first section provides a brief overview of trends in community mapping and covers several ways that GIS maps can be utilized in com-

munity development. The second section discusses challenges in using GIS in community mapping efforts, and offers best practices and strategies for promoting community mapping efforts.

The intended audience for this paper is decision-makers of community based-organizations,<sup>[3]</sup> although it is also relevant for local government officials, academics, and other groups interested in community development issues. Primarily, the aim is to convince local non-profit directors and their boards of the significant benefits of community mapping, while at the same time realistically outlining the potential costs and pitfalls related to such efforts.

## NAVIGATING NEIGHBORHOODS: THE COMMUNITY MAPPING MOVEMENT

Although community mapping has its origins in the nineteenth century (John Snow’s maps of cholera cases in the London epidemic of 1854 and Jane Addams’ neighborhood surveys around Chicago’s Hull House are two prominent examples<sup>[4],[5]</sup>), two trends in the past twenty years have helped pave the way for the modern GIS-based community mapping movement. The first trend is a focus on performance measurement and accountability in the non-profit sector. Many non-profit executives realized they could maximize services by adopting the kind of stringent budgeting, finance, and management practices utilized in the private sector. As a result of the focus on performance measures, many human service organizations began to undertake projects such as community needs assessments and asset mapping projects to plan strategically for service delivery. For example, in the 1990s the United Way began to promote social indicator projects so that community organizations could track local progress on issues like child health, social welfare, and quality of life issues.<sup>[6]</sup>

The second trend is the growth of community/university partnerships, with many universities engaged in initiatives to

share resources with underserved neighborhoods.<sup>[7]</sup> Community-based participatory research (CBPR), which combines the research and analytical expertise of professional researchers with the local and institutional knowledge of community members, has been a centerpiece of this movement.<sup>[8]</sup> CBPR has expanded to GIS in the form of Participatory GIS (PGIS) and Public Participation GIS (PPGIS).<sup>[9]</sup> Essentially the same concepts, these efforts assume the same goals as CBPR within the more specific research mode of GIS.

These two trends—non-profit accountability and university/community partnerships—have led to a proliferation of community mapping efforts in recent years. These efforts can be sorted into five general categories:<sup>[10]</sup>

#### *What's Going On In Our Community?*

GIS can help organizations better understand how their communities are changing, both for better and for worse. Many communities have implemented online databases in which the public can identify attributes of properties in a specific geographic area. Neighborhood Knowledge Los Angeles, which allows users to map features such as tax delinquent properties, building permits, at-risk affordable housing, code complaints, and local non-profit organizations, is an example of this type of project.<sup>[11]</sup>

#### *What Can We Do About It?*

Community mapping projects can identify the need for expanded systems of community service and support in underserved neighborhoods, or for persons with special needs. An example of this kind of project is the Reentry Mapping Network, a partnership between the Urban Institute, the Annie E. Casey Foundation, and fourteen community-based organizations throughout the country.<sup>[12]</sup> The project identified supportive services for former prisoners and gaps in the service system by tracking prisoner re-entry in a specified area. This information was used to facilitate cooperation among various stakeholders in the larger community.

#### *What Can the Market Do About It?*

GIS mapping projects can also help communities connect to the marketplace. Communities can identify areas of future redevelopment and revitalization, such as vacant plots or abandoned properties, with Neighborhood Knowledge Los Angeles. Further, they can make suggestions for intended development, such as affordable housing, preferred commercial services (e.g., banks, grocery stores), or public transit. Community maps also allow neighborhoods to organize opposition to undesirable land uses. For instance, communities experiencing gentrification might not wish to see high-end housing or upscale shops in their neighborhoods, while blighted neighborhoods might oppose additional liquor stores, payday lenders, and pawn shops.

#### *What can the Government Do About It?*

Community-based organizations can employ GIS mapping to connect residents to elected officials and government benefits and services. For example, the New York Public Interest Research Group Community Mapping Assistance Project created an online tool, “Who Represents Me?,” to provide residents with the names of their elected officials.<sup>[13]</sup>

#### *What Next?*

Finally, groups can use community mapping to display project progress and outcomes more clearly, which can help raise and maintain necessary funding. Further, even after a project's aims have been met, the tool can be a resource for future collaborations. The Richmond Neighborhood Indicators Project, a successful revitalization planning effort in Richmond, Virginia, is highlighted in several publications as a model for future GIS community mapping work.<sup>[14]</sup>

### **BEST PRACTICES AND STRATEGIES FOR SUCCESS**

The intent of this section is to serve as a resource for organizations undertaking GIS community mapping projects. Outlined below are five best practices that were identified through an examination of many community-mapping projects. Each practice includes specific strategies to address common challenges and roadblocks.

#### *Plan Thoroughly*

It is critical to develop a strategic plan that demonstrates how an organization wishes to use GIS. The intended user of the mapping product should be clearly identified in order to guide decisions about what type of system and what kind of maps should be developed. For example, in

a community with very low rates of Internet access, an online mapping database would probably not be a good investment of resources.

A common criticism of GIS mapping is that it can take up more money, staff time, and resources than originally planned. Therefore, conducting at least a preliminary benefit-cost analysis at the start of the project is essential. Open-source GIS software might be available for free or at a fraction of the cost of proprietary versions, but there might be other costs for these products, such as technical assistance needed to customize the software for a specific project. Initial investment in high-quality technologies and data sources can save headaches later on.

#### *Expect the Unexpected*

Developing a plan for a community mapping project does not ensure that the project will unfold exactly according to that plan. As one community leader stated, “To be honest, we had no idea what this project would entail, financially or in terms

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of staff time. But we always find a way to keep it going and make it better.”<sup>15</sup> Unexpected outcomes are likely to occur, and it is unlikely that even the most thorough planning will account for every detail. As such, maintaining flexibility is an important attribute. Community priorities and goals might change with time, and successful initiatives are those that maintain the flexibility to change once the process is underway.

Organizations should also recognize that the process of planning and implementing a community mapping initiative can be as beneficial as the end result. Participants in community mapping projects have indicated that while the final products created in such efforts are useful to the community, intangible improvements in quality of life, neighborhood relations, and students’ understanding of new communities might be the most significant outcomes of all.<sup>16</sup>

#### **Prepare for Sticky Issues**

Some problems are endemic to most community mapping projects: privacy concerns, resistance to technology, and neighborhood politics. Although the data used in GIS projects is typically available to the public, mapping this data tends to make it more readily available. Policies such as mandatory password protection, offering the maps at a central location, or providing only summary data have been some ways that organizations have responded to privacy concerns when providing data at the neighborhood or parcel level.

Community conflict is likely to arise at some point. While conflict is a natural part of community discourse, disruptive conduct can be an impediment to progress. To minimize these distractions, set ground rules in all meetings and be sure to invite all parties to the table at the start of the project. Also, allowing full participation early on can help to avoid later, larger problems with community acceptance and project implementation. Despite the benefits of the technology, some groups and individuals will not see the value in a GIS mapping project. Taking the time to address these concerns, however, is vital to the success of a project.

#### **Find Creative Funding Sources**

Creative funding strategies are always a critical issue for community mapping efforts. Potential budget items include: data collection costs (purchasing and staff time), GIS costs (computer, software, and training), distribution costs (printing, creating presentations, outreach/marketing), and staying up-to-date (data management, updating maps).<sup>17</sup> Some foundations and other funding entities offer planning grants and operational funding for mapping initiatives. Consider pooling resources by teaming up with other non-profits or community

partners, exploring open-source or Web-based GIS software to cut program costs, or outsourcing. For example, the Green Info Network provides low-cost GIS services to other non-profit organizations.<sup>18</sup>

#### **Build Strong Partnerships**

Successful community mapping models generally include representatives from a broad coalition of local stakeholders, including community-based organizations, local governments, colleges/universities, and community intermediary groups.<sup>19</sup> Aim to include at least one member from each of these institutions in your initial meetings. A number of successful initiatives cited strong relationships with local public officials as a key factor, noting that those officials provided access to crucial local data. Improving access to these data sources is a significant way that local governments can support community mapping efforts.

Equally important to building strong partnerships is to have patience with the process. A leader in the Richmond Neighborhood Indicators Project explains: “We learned that when you are setting up a GIS project, a participatory process is extremely important. When you are trying to build trust, having partners at the table is critical. The whole process takes time.”<sup>20</sup> In this sense, collaboration is not a best practice; it is a “must” practice.

#### **CONCLUSION**

Community mapping projects have the potential to revolutionize the community development field in two ways: first, as bridges across the organizational digital divide, and second, as models of effective partnerships that can also serve as best practices for more traditional forms of community development. GIS mapping projects can enhance the effectiveness and capacity of community-based organizations, and can also propel a community into action by illustrating local trends and indicators. These are fundamental goals of community development organizations working to combat the effects of poverty, discrimination, gentrification, and crime.

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#### **ENDNOTES**

1 “Mapping Texas Communities: An Introduction to GIS & Community Analysis,” New Urban Research, Inc., Austin, Tex., February 2007.

2 City of Austin, “City of Austin Demographics Map Library,” <http://www.ci.austin.tx.us/census/>.

3 Specifically, the audience for this paper is U.S. local non-profit organizations focusing broadly on issues of community development. I use the terms non-profit organization, community-based organization, community development organization, and human service organization interchangeably throughout the paper.

4 Steven Shapin, “Sick City: Maps and Mortality in the Time of Cholera,” *The New Yorker*, 6 Nov. 2006.

5 Action for Change, “Raise Your Voice: Community Mapping Guide,” <http://www.actionforchange.org/mapping/history>.

- 6** United Way of America, "Outcome Measurement Resource Network," <http://national.unitedway.org/outcomes/library/satrpts.cfm>.
- 7** Beth Savan, "Campus and Community: Partnerships for Research, Policy and Action," in *Creating Knowledge, Strengthening Nations: The Changing Role of Higher Education*, ed. Glen A. Jones, Patricia L. McCarney, and Michael L. Skolnik (Toronto: University of Toronto Press, 2005), 195.
- 8** Agency for Healthcare Research and Quality, "Community-Based Participatory Research: Conference Summary," <http://www.ahrq.gov/About/cpcr/cbpr/cbpr1.htm>.
- 9** Collectively I refer to these efforts as "participatory GIS."
- 10** These classifications are informed by Josh Kirschenbaum and Lisa Russ's November 2002 report, *Community Mapping: Using Geographic Data for Neighborhood Revitalization*, which outlines five categories of community mapping activities. I have renamed the categories but the general classification structure is attributable to Kirschenbaum and Russ. Josh Kirschenbaum and Lisa Russ, *Community Mapping: Using Geographic Data for Neighborhood Revitalization* (Oakland, Calif.: PolicyLink, 2002).
- 11** Neighborhood Knowledge Los Angeles, <http://nkla.sppsr.ucla.edu>.
- 12** The Urban Institute, "The Reentry Mapping Network," <http://www.urban.org/projects/reentry-mapping>.
- 13** New York Public Interest Research Group, "Who Represents Me? New York City," <http://www.cmap.info/netmaps/MyGovernment/NYC/MyGovernmentNYC>.
- 14** Loren Blackford and Lisa Mueller, "Partners Power GIS," National Housing Institute: Shelterforce Online, <http://www.nhi.org/online/issues/126/gispartner.s.html>; and Local Initiatives Support Corporation, "Mapping for Change: Using Geographic Information Systems for Community Development," <http://www.lisc.org/content/publications/detail/835>.
- 15** Local Initiatives Support Corporation, "Mapping for Change: Using Geographic Information Systems for Community Development," 17.
- 16** The WUNMAP Project: Community-Based Mapping Through Student-Resident Interaction, "Overview and Data," [http://www.uoregon.edu/~wunmap/about\\_wunmap.htm](http://www.uoregon.edu/~wunmap/about_wunmap.htm).
- 17** Kirschenbaum and Russ, *Community Mapping: Using Geographic Data for Neighborhood Revitalization*.
- 18** Green Info Network, <http://www.greeninfo.org>.
- 19** Often foundations or national community organizing groups such as LISC, Appleseed, or ACORN serve in this role.
- 20** Kirschenbaum and Russ, *Community Mapping: Using Geographic Data for Neighborhood Revitalization*.