

Scaling-Up as a Grand Challenge for Public Participation GIS

By Dr. Timothy Nyerges¹, University of Washington
(Sep 20, 2005)

Source: Directions Magazine http://www.directionsmag.com/article.php?article_id=1965

Does it matter whether public-oriented decision processes and outcomes are transparent, accountable and fully informed? Participatory decision making is as old as democracy. From national elections to local land-use planning, participatory decision making exemplifies the democratic maxim that those affected by a decision outcome should participate directly in decision processes.

For years, a GIS has been called a decision support system (Cowen 1988). When we connect GIS with participatory contexts we get “participatory GIS,” (PGIS) (Harris et al. 1995, Jankowski and Nyerges 2001) or a “public participation GIS” (PPGIS) (Nyerges, Barndt, Brooks 1997), or community integrated GIS (Craig, Harris, and Weiner 2001). The term *public* is defined by the *American Heritage Dictionary Fourth Edition* as “the community or the people as a whole or alternatively a group of people sharing a common interest as in the reading public. The term participation is defined as the act of taking part or sharing in something.” Given that the term *public* is an adjective qualifying *participation* in PPGIS, the term PGIS is actually the broader, more inclusive, of the two phrases – although some researchers prefer to restrict use of “PGIS” to participatory development within [developing countries](#). In the late 1990’s, the phrase “community integrated GIS” became preferred to refocus research effort on community (Craig, Harris and Weiner 2001). Whether we use “participatory” or “public participation” or “community integrated” does not matter, as public is commonly constituted of diverse groups with varying interests.

Regardless of the label, individuals as part of the public and groups within the public are often marginalized in public decision processes. Groups/communities traditionally marginalized, i.e., under-represented in decision processes at macro scales, are now organizing with the help of action research projects. For [example](#), within the City of Milwaukee, in a project called *Making Connections*, residents helped with GIS maps to form a story about community development potential. In [another example](#), drawing on local knowledge of indigenous peoples, participatory 3D modelling helps visualize landscapes for protected area management in Southeast Asia. In a [third example](#), local knowledge from Native American tribes is sensitive to tribal cultural history. Unfortunately, GIS data recording of such knowledge could be exploited for development purposes and/or to protect culturally sensitive sites. In the studies above, as well as in most PPGIS activities, participation focuses on smaller groups rather than larger groups.

When examining an ability to give the public a voice in democracy, marginalized voice is a fairly pervasive problem. Practically speaking, the general public is constituted of many diverse groups – even if we consider the public as a *whole*. The *general public* is actually a marginalized group when it comes to participation processes, as there is no single, directed voice in the public.

Despite many federal, state and local laws that require public participation, research about local governance indicates that large-group participation in publicly oriented

¹ Timothy Nyerges is a Professor in the Department of Geography at the University of Washington, currently serves as the Research Committee Chair of the University Consortium for Geographic Information Science, and was recently program chair for the URISA 2005 PPGIS Conference. His research interests include participatory GIS for integrated management of land use, transportation, and environmental conditions in urban areas.

decisions commonly involves little *meaningful participation*. Meaningful participation can be defined in terms of *access to voice* (a deliberative process) and *competence of knowledge(s)* (an analytic process) that fosters *shared understanding* about values, interests and concerns that underlie the recommendations/choices to be offered/made by those with a stake in the decision ([National Research Council 1996](#)). Meaningful participation is a hallmark of a healthy democracy, particularly deliberative democracy in contrast to representative (make a vote) democracy.

Deliberative democracy involves empowerment wherein a reasoned discussion among people promotes shared understanding on a topic followed by consensus building. Although interest in deliberative democracy has existed for over 100 years ([Gastil and Levine 2005](#)), research and practice has blossomed since the late 1980's. Over the past decade, hundreds of deliberative democracy events of varying sizes have occurred across the world. A synthesis of case studies appears in a *Deliberative Democracy Handbook* ([Gastil and Levine 2005](#)). Several of the chapters deal with location-based issues, and thus GIS could be useful. However, no chapters actually refer to GIS, a seeming disconnect and latent opportunity. Of special note, some deliberative events have involved thousands of people at once. In 2002, [AmericaSpeaks](#), a not-for-profit organization located in Washington D. C., organized a 21st Century Town Meeting at the Javitt's Center in New York City that brought together more than 3,000 people to discuss redevelopment plans for the World Trade Tower site after September 11, 2001. Unfortunately, such activity comes at great expense, requiring hundreds of facilitators at multiple levels of responsibility.

Research about analytic-deliberative decision processes has shown that meaningful public participation is possible and decision outcomes are improved ([National Research Council 1996](#)). The analytic component provides technical information that ensures broad-based, competent perspectives. GIS has provided technical information in such processes as maps can represent changes in landscapes. The deliberative component provides an opportunity to give voice to choices about values, alternatives and recommendations. Unfortunately, such public participation has been expensive and time consuming, and involved small to medium-sized groups (10-15 people). Working through analytic-deliberative participation in small to medium-sized groups in face-to-face settings is a start, but scaling analytic-deliberative participation to large groups is a challenge – as scale matters.

In addition, whether groups are better supported in face-to-face settings or in asynchronous settings is still an open research question. It is often thought that face-to-face participatory settings are superior to asynchronous participatory settings. It only seems reasonable. However, [Dowling and St. Louis \(2000\)](#) have shown that an asynchronous nominal group process was more effective than a face-to-face nominal group process, at least in a small group setting – a challenge to anecdotal feelings about face-to-face participatory processes.

Based on the following three observations: (1) public participation is mandated by many federal, state and local laws encouraging core democratic process; (2) the Internet is growing in popularity and access is getting better even for under-represented groups as reported in several studies; and (3) asynchronous, structured participation methods have been shown to be at least as good and in some cases superior to face-to-face participation; perhaps an Internet platform combining GIS (i.e., data management, spatial analysis and geovisualization) technologies, decision modeling technology, and communications technology into a geospatial portal to support an analytic-deliberative process might be one way to foster meaningful participation in large groups as well as hold down the cost to all who wish to participate. This rationale is the basis of the US National Science Foundation-funded research activity called the Participatory GIS for Transportation ([PGIST](#)) Project. The principal research question for the project is: What Internet platform designs and

capabilities, particularly including GIS technology, can improve public participation in analytic-deliberative transportation decision making within large groups?

Addressing that question involves intensive interdisciplinary work. From experience on several large interdisciplinary projects over the past decade, getting researchers to work with one another has been equally as challenging as getting stakeholders to work together. The commonality of that challenge and the one for analytic-deliberative public participation involves resolving mismatch of language meanings, e.g., the meaning of transportation-based valued-concerns. Computer-supported resolution of mismatched meanings among many people is at the core of the grand challenge. Certainly, this essay is not the first to recognize this challenge. Other literature, e.g., dealing with boundary objects in science and technology studies, recognize a similar challenge. The difference here, however, is in recognizing that scale really matters, and is particularly constraining when working in a computer-mediated setting. For those who see the World Wide Web as promoting anytime, anywhere and anytime work, it just isn't so as yet in connection with analytic-deliberative work at large, participatory scales – what just might be considered a grand challenge for PPGIS work.

References

- Cowen, D. 1988. GIS versus CAD versus DBMS: what are the differences? [*Photogrammetric Engineering and Remote Sensing*](#), 54, 11, 1551-1555.
- Craig, Will, Trevor Harris and Daniel Weiner (Editors) (2001) [*Community Participation and Geographic Information Systems*](#). Taylor and Francis.
- Dowling, K. L. R. D. St. Louis 2000. Asynchronous implementation of the nominal group technique: is it effective? [*Decision Support Systems*](#) 29:229:248.
- Gastil, J and P. Levine 2005. [*The Deliberative Democracy Handbook*](#). San Francisco: Jossey-Bass.
- Harris, Trevor M., Weiner, Daniel, Warner, Timothy A., and Levin, Richard. 1995. Pursuing social goals through participatory geographic information systems. Redressing South Africa's historical political ecology. In Pickles, J., ed., [*Ground Truth: The Social Implications of Geographic Information Systems*](#). New York: Guilford Press. 196-222.
- Jankowski, P. and Nyerges, T. 2001. [*Geographic Information Systems for Group Decision Making: Toward a Participatory, Geographic Information Science*](#), London, Taylor & Francis.
- National Research Council 1996. [*Understanding Risk: Informing Decisions in a Democratic Society*](#), Washington, D. C., National Academy Press.
- Nyerges, T, M. Barndt, and K. Brooks, 1997. Public Participation Geographic Information Systems, *Proceedings, Auto-Carto 13*, Seattle, WA, American Congress on Surveying and Mapping, Bethesda, MD, pp. 224-233.