# Emplaced Mapping and Narratives within the Participatory Planning Process

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## Abstract

Digital methods of documentation paired with participatory-action research are used by the authors in a participatory landscape planning process. Facilitated Volunteered Geographic Information (f-VGI), photo mapping, and route mapping using online interfaces are employed in the field, enabling the collection, storage, retrieval and interpretation of data collected by users in real time public meetings. Integration of digital methods and technologies support powerfully communicative landscape planning, by enabling rich, visual and narrative data collection in conjunction with public involvement in content analysis.

## 1 Background

Two great challenges facing small communities are obtaining an accurate picture of the workings of the existing built environment and gaining an understanding of how the built environment performs relative to local needs. If local decision making can be related rigorously to landscape performance, then decision makers can work with efficacy to guide the future of their communities (CORBURN 2002). In small communities, financial resources and expert staff are unavailable and complex decisions fall on the shoulders of lay leaders. This setting necessitates communicative planning, collaborative learning and discovery (KEMMIS 2001), and rich explanations of problems and solutions imbued with local experience (INNES 1998).

As a proven viable method for both gathering geo-referenced information and providing a real-time / real-space learning opportunity for residents, the authors have implemented participatory planning techniques (as a component of the GeoDesign process) in more than 50 rural communities to help plan safe routes to schools, create better trails, and plan for disaster recovery. The integration of digital methods of environmental mapping and data capture with communicative planning and participatory-action research frameworks (BARGOLD 2010) allows narrative forms of knowledge and value-laden local geography to become explicitly and appropriately engaged during the planning process. Earlier efforts in the realm of digitally supported communicative planning (AL-KODMANY 2001) emphasized how well various methods reduced "the communication gap" between designers and residents. The approach described here proposes a partial erasure of boundaries between expert "knowledge creators" – the planner / designer – and the resident / client, which is enabled by the digital methods paired with facilitated content analysis. Framed as an action

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research process, the analysis of place performance and factors affecting the performance are explored jointly in a facilitated research / learning process.

Understanding that community residents do not frame their perception or description of place in abstract technical terms employed by physical planners, the authors consciously employ visual and spatial media in the action research / analysis process. Residents / collaborators are asked to explore their environment, capturing information about their community in response to prompt questions. The results are uploaded to a server and shared on-site in a public meeting, allowing participants to see the raw data, and participate in interpreting them with the planners / designers. Mapping visual quality, routes, places of special significance, areas of conflict or features that cause problems, along with notes from residents, creates a rich, multifaceted description of place, systems and performance.

### 1.1 ILR Community Visioning Program and Local Transportation Systems

The Iowa's Living Roadway Community Visioning Program assists residents of small rural communities map, analyze and create proposals for local transportation systems. Transportation elements include trails, sidewalks, local streets, and primary highways; related programs include health-related exercise, leisure and tourism, in addition to access to essential services and mobility needs of seniors, children and disabled individuals. Because the program seeks to build on local needs and desires, users are invited to share their experiences and insights of the local system as a foundation for developing proposals. This participation is implemented through geospatial surveys, focus groups and photo-mapping workshops.

## 2 Methods

The authors utilize participatory geospatial analysis within an investigative and participatory planning process, emphasizing involvement of users during both data collection and content analysis phases of the program. For the purpose of this paper, these phases will be referred to as unique projects. The first project uses a web-based geo-enabled survey tool for an asset- and route-mapping process that allows citizens to identify and map the concerns they have regarding barriers to walkability, to map the locations of the routes they walk or bike most frequently and to map the locations where they wish additional routes could be created. The second project extends traditional focus group methodology to include collection of visual data through the use of GPS-enabled cameras to locate and comment on features or qualities relevant to the group discussion. After uploading the photos to a geospatial platform developed by the authors, the data become available in real-time for all focus group participants and project leaders to query and analyze during the facilitated workshop. Each of these methods is described in more detail in the following section.

### 2.1 Geospatial Survey

The survey is conducted as a random-sample survey where selected residents are mailed a postcard that provides the web address and a unique login ID for the survey. Residents that do not receive a postcard are also welcome to complete the survey and are identified as

self-selected respondents. All participants fill out a series of demographic questions to ascertain the amount of physical activity in which they engage as well as other transportation-related preferences. Respondents confirm their place of residence that is depicted on a map based on their street address information. If their place of residence is inaccurate on the map, respondents have the option to "move" their residence, represented as an icon of a house, to the correct location. Respondents are then asked if they walk, bike, or run and if so how often. If the respondent answers that they participated in any one of these activities at least once per month, a new map that has been zoomed and centered on the location where they live is displayed. Respondents are then prompted to "draw" with the mouse the route(s) they use. Participants complete a unique map for each form of physical activity in which they indicated that they engage in. Additionally, each participant is asked to identify on the map any routes they wish would have sidewalks or bike lanes added to allow them to walk or bike more easily.

An assets and barriers map interface is also included as part of the survey and allows the user to drag and drop icons to the map to locate barriers that they believe make it difficult for them to walk, bike or run. Barriers may include lack of sidewalk, vegetation encroaching the sidewalk, or locations where it is difficult to cross the street (see figure 1).


**Fig. 1:** Mapping interface allows users to locate assets and barriers on a map of their community by selecting an item from the panel on the right and then clicking on the map to locate and provide comment.

## 2.2 Photo-mapping Focus Group

Focus groups of distinct users are organized, supported by and facilitated with geospatial information. The focus group discussion revolves around uses, destinations, assets and barriers; motivations for travel; and qualities important to satisfying desires for travel. During the discussion, a facilitator transcribes participants' comments on a physical map to capture the relationship of space, distance, and locations to necessary and desired uses. Following the discussion, participants explore the community and document specific instances of barriers or assets using cameras with built-in geo-location. The choice of asset

or barrier is determined by the user, but must be related to the group discussion and supported by comments that explain the image and the related issue. These data are uploaded to a server and later examined during a facilitated community workshop (see Figure 2).

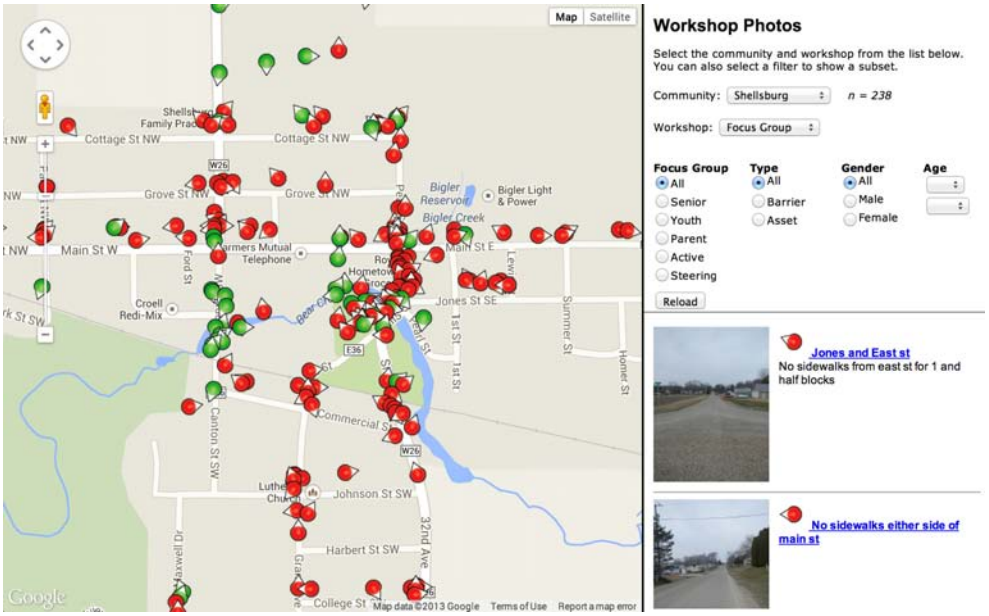


**Fig. 2:** A photo mapping interface presented during the workshop allows users to filter the data to show only points submitted during a certain workshop or to limit the data by attribute. Photo markers are color-coded and point in the direction the photo was taken. Clicking on a point displays a thumbnail of the photo along with participant comments while clicking on a photo from the list on the right displays a high-resolution copy of the image.

## 3 Technical Processes

Both the survey and the focus group projects required the implementation of three main technical components: data entry, data processing and the display of results. Data for both projects are stored in MySQL and Microsoft SQL databases. Connected to an ArcGIS SDE, the Microsoft SQL facilitated data requiring complex geoprocessing steps, whereas the MySQL provided a local database that could easily populate the participatory interfaces in situations where Internet access was limited.

Data entry for both projects included traditional AJAX forms with error checking. The map interfaces in project one utilized Google Maps for both the routes and barrier mapping. To visualize the routes identified by respondents, the geometry of the routes was transferred to the SDE where it was geoprocessed to produce a weighted route map (see Figure 3).

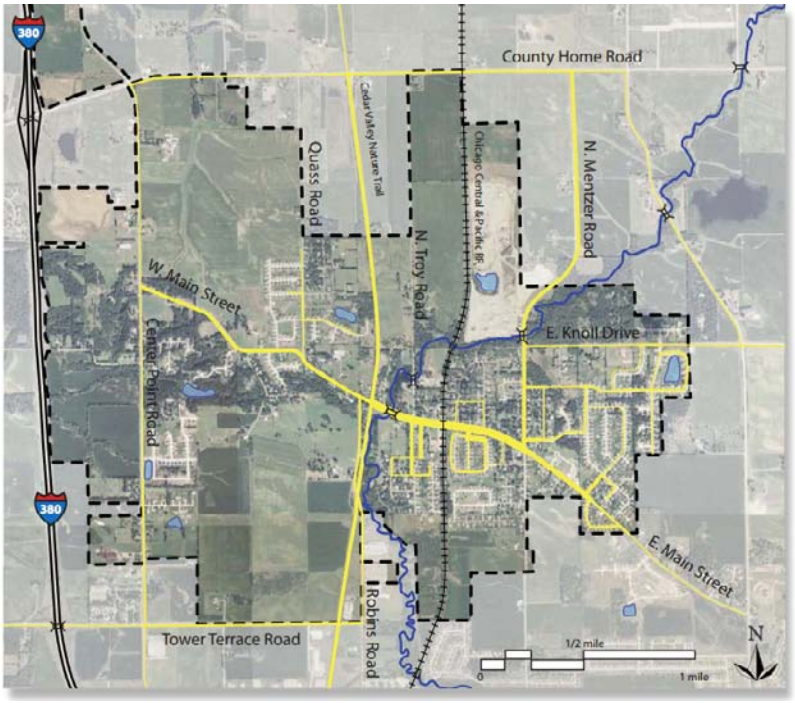


**Fig. 3:** User routes illustrated using weighted lines clearly show the most popular routes in this community.

The photo-mapping project utilized Nikon CoolPix cameras. During the workshop, each participant is provided a clipboard and a camera. As the participant takes pictures they record on a "low-tech" paper worksheet information (e.g., if the item is an asset or barrier) on what is depicted in each photo. When participants return the cameras and worksheets, workshop staff uploads the photos and transfer the worksheet information into the database. As photos are uploaded, scripting developed by the authors extracts the geo-coordinates and camera-view direction and resizes the photos. This information is also entered into the database where it can be used by the display component of the project.

To create an effective and user-friendly display of the results, the authors developed a data engine to query and display the data to an interface that could be easily used. The jQuery JavaScript library, PHP, JSON and a little bit of code from the Esri JavaScript API worked perfectly to develop a user interface that can be displayed on multiple Internet browsers – therefore extending the project team's ability to engage more citizens.

## 4 Content Analysis

With the assistance of expert facilitators in both the survey and the focus group projects, participants are able to see the digital data collected within their community in an online display. Routes, images, and associated comments are displayed within a map context,

relating data elements to familiar places. Facilitators open the online interface and explain the data to participants, guiding them in the discovery of similarities and differences in user perspectives and common threads of thought ranging from the concrete, such as physical connections, to the abstract, such as aesthetic qualities and underlying drivers for aesthetic preferences such as memory, place attachment and cultural associations.

The authentic expression of place experience enabled by digital media in photos and first person commentary or annotation is important in empowering some users, such as children and the elderly, to communicate their particular needs and express their perspectives on landscape change. Whether operating at a landscape scale or at a site scale, the digitally enhanced process of exploration, discovery, reflection and communication provides a narrative about place, people and landscape that resonates with local values and experience. This process effectively reveals how fleeting landscape phenomena, such as snow drifting or flooding, affect place perceptions, landscape use and the reliability of built infrastructure.

Content analysis can be conducted the same day that data are collected if the participants have been recruited in advance by the local project steering committee. The primary benefit of this timely data analysis activity is that participants more quickly "read" the data, becoming intrigued with differences that emerge. Residents with contrasting physical needs can explore differences in landscape performance; those of different generations can explore differences in perceived usefulness of landscape elements, qualities or features. The significance or impacts of the content captured in the data is explored with the assistance of the facilitator, allowing the first interpretation of the data to occur in real time with participants. Thus the final analysis has within it emplaced narratives, reflective of the experience of residents who participate in the inquiry.

# 5 Discussion

Both participatory approaches help participants understand the variety of needs and preferred qualities of community landscape and how the landscape affects behaviour, and provide documentation of landscape performance in terms understandable to local audiences (BADENHOPE 2005). Some of the findings regarding landscape preferences from this participatory, action-research process are predictable and are reinforced by the literature. For example, residents' efficacy in maintaining activity levels or getting to school relates directly to continuity of sidewalks, provision of adequate lighting, and lack of physical barriers (NASER 2008). Within this digitally supported process, abstract systems and less visible perceptual barriers also become evident and understandable to users / participants. Other findings are not quite as predictable, particularly those related to life patterns and personal histories of local residents in relationship to particular places. It is here that the notion of "emplaced narratives" becomes instrumental in revealing hidden dimensions of human environment interactions that affect transportation use and behavior. The influences of place attachment, place identity and community sentiment are revealed through collaborative exploration and discussion of places and their importance in supporting individual and community life activities. As an example, children may resist an objectively determined safe crossing because it is near "the scary woods" or adult walkers may prefer to walk in a cemetery because they "like local history" and value "connections to the past." This information is particularly useful for local decision makers and landscape

architects charged with creating physical plans and designs that work to allow a particular use and express qualities associated with a particular place. Ultimately, these same local decision makers may use this evidence and resident narratives to convey the necessity and value of changes embodied in resulting landscape proposals.

In the crowdsourcing projects presented here, facilitated Volunteered Geographic Information (f-VGI) is critical to maintaining quality. Whereas VGI allows users to provide voluntary, unsolicited information on their own, f-VGI utilizes predefined criteria and prompts users to respond to a set of queries or directives that guides the range, type and spatial extent of the information to be provided (SEEGER 2008). In the first case, the data collection is quite bounded; while in the second, the nature of the landscape and the qualities to be documented emerge from the focus groups. Both methods provide a mechanism for the nature of landscape systems to be explored prior to the crowdsourcing activity. In this way, rigor and empowered participation are intertwined in local planning.

A key element of a GeoDesign framework is maintaining quality of the data and analysis, while opening the inquiry to public audiences. As discussed by visual ethnographers, digital media and methods have created unprecedented opportunities for capturing content in an enthnographic-driven research process (PINK 2012). Framing questions based in literature, participatory but guided digital assessment, and facilitated content analysis provide structure that ensures quality and empowerment in landscape knowledge construction.

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