As rural America faces increasing pressures to develop its open spaces, many communities need help in assessing land-use alternatives. Geospatial software and hardware incorporated into comprehensive decision-support systems (DSS) may be one way to help. More affordable, user-friendly, and analytically robust than ever before, these systems are helping communities explore potential environmental, economic, and social impacts of various land-use alternatives. In a pilot community demonstration, RGIS-Pacific Northwest explores the strengths and weaknesses of a DSS as it is used to help one rural community make sound land-use decisions.

The city of Roslyn, along with other communities in the central valleys of Washington state, is facing its future. It has come in the form of a large master-planned resort community that offers both promise and pitfall.

Small communities like Roslyn are not alone. Communities in many states are experiencing increased development pressure as growth pushes urban areas ever-outward, swallowing agricultural land and undeveloped, often pristine, open spaces. Besides losing precious land and cultural resources, many communities face rapidly increasing demands on their physical and social infrastructures.

Involving citizens

Among the ways today’s planners are addressing rapid, uncontrolled growth are policies promoting “smart growth,” a controlled, comprehensive, community-supported planning approach to population growth. An important facet of smart-growth policy making is public participation. It makes sense to involve community members in the decision-making process, as they are the ones who are affected by planning outcomes. And it makes sense for citizens to participate and share their knowledge and concerns. Ultimately, everyone benefits when citizens contribute to their community’s future.
Despite the good intent in smart-growth legislation, citizen motivation is often lacking. Public meetings, hearings, workshops, and citizen-advisory committees have been typical venues for public participation. But in reality, lengthy meetings, jargon-laden language, and difficult concepts have hindered citizens from becoming more involved. Increasingly, planners are looking for ways to make community planning more inviting.

Improving access
Geospatial technologies, such as GIS, have become useful tools for community planning. Besides offering powerful analytical capabilities, methods that involve interaction and real-time analysis help engage citizens and boost their interest in the planning process. Until recently, these technologies have not been readily available to, or easily understood by, the
and the DSS software can provide the analysis in minutes. The real-time format promotes and supports public debate and decision making.

- **System transparency**
  The modified DSS are more “transparent” to users. They are more easily understood and operated by lay persons than in the past.

- **Visualization**
  Superior graphics and visualization capabilities help communicate ideas clearly at public forums, which successful public participatory decision-making often requires.

**Roslyn applies decision-support system**

Recently, RGIS-Pacific Northwest applied their selected version of a DSS, Community Viz, to support spatial decision making in Roslyn, a rural community beset by an impending population boom (see “Boom or Bust,” *Land Information Bulletin*, 2003). Roslyn, population 1,017, is witnessing the construction of the first master-planned resort approved under the Washington State Growth Management Act. This new development could revitalize Roslyn and other communities that have long been at the mercy of a boom-bust economy. However, skeptical residents of Roslyn fear the resort could accelerate population growth in a region that is not prepared for it, resulting in environmental degradation, reduced access to recreational lands, and unwanted changes to community structure.

Modified GIS and communication tools that are designed to enhance the participation process have been developed and are being tested in community settings. Readily available, and more user-friendly than ever before, these modified tools are a powerful means for engaging and empowering citizens during the planning process. We refer to these modified technologies, which are designed to support spatial decision making, as decision-support systems (DSS). They are also sometimes referred to as spatial decision-support systems (SDSS), and planning support systems (PSS). The DSS discussed in this publication is called Community Viz, developed by the Orton Family Foundation (see sidebar, previous page). Decision-support systems, such as Community Viz, offer a number of valuable features:

- **Real-time analysis**
  Decision-support system development integrates the analytical and spatial capabilities of GIS, including improved visualization technology operating in “real time.” For example, someone in a meeting may raise a question that requires analysis. A GIS technician can retrieve the pertinent data “on-the-fly” and the DSS software can provide the analysis in minutes. The real-time format promotes and supports public debate and decision making.

**Areas subject to development pressure (blue) dominate the community of Roslyn’s northern edge.**
The Roslyn community needs to visualize and better understand the implications of rapid development pressures that are sure to accompany the new resort. To assist Roslyn, and as part of a pilot study to evaluate the usefulness of Community Viz, RGIS-PN has held educational workshops in the community. The purpose is to demonstrate how Community Viz can support spatial decision making at the community level.

Lessons learned
How a community perceives the usefulness of a new tool or strategy in the land-use decision making process may be as important as the functionality of the tools themselves. Are they understandable? Do they engage people or confuse them? Are they difficult to use?

To uncover strengths and weaknesses of decision support systems, workshop participants were asked to comment on the effectiveness of Community Viz. Here is what they reported.

Strengths
* **Multiple alternatives.** Many participants thought Community Viz was useful in its ability to create, compare, and contrast multiple alternative scenarios for land use.

* **Real-time analysis.** The real-time analysis was deemed very beneficial. The capability to generate nearly instantaneous responses to queries concerning impacts of development options made the process both efficient and engaging. Traditionally these queries would be recorded, investigated at a later date, and the results presented at a future meeting. In the past, the time lag and lack of continuity contributed to dwindling citizen interest.

* **Visualization capabilities.** Many participants agreed that the visual and dynamic capabilities of Community Viz helped make ideas, questions, and concerns easily understandable for the general public. Because many people tend to be “visual thinkers,” visualization techniques aid lay persons in their understanding of spatial problems. People reported that Community Viz, due to its strong incorporation of visual techniques built into each component’s functionality, was a valuable addition to community decision making. One workshop participant commented that it “helps people make useful, informed comments at public meetings; the visual aids are priceless…” The comments were a good indicator of how important high-quality, accurate visualization tools and methods are for engaging citizens and other stakeholders.

Weaknesses
* **Technological discomfort.** Not everyone is technologically inclined or comfortable with electronic processes. Unfamiliarity with DSS technology and computers in general could alienate individuals or groups during the decision-making process. This runs counter to the objectives of this technology, which aims to promote increased community participation. Ease of use and transparency are crucial to the design of DSS tools to prevent alienating community groups.

* **Lack of data.** Access to high-quality data is essential for a DSS to produce meaningful results. The cost of developing site-specific data could be expensive, representing a potential barrier to DSS implementation.

* **Cost.** The costs of DSS software and hardware can be considerable. Roslyn, for example, has a limited annual budget for maintaining community services. Investment in DSS tools that have expensive start-up costs are not feasible, especially if they require additional personnel training. If this technology is to benefit rural communities it will need to become more affordable.

* **Distrust of outside entities.** Some community members said they were hesitant to rely on outside institutions/agencies to guide the use of the DSS for community decision making. There were concerns that outside entities might not be aware of, or sensitive enough to, community dynamics. Without appropriate sensitivity, power shifts among political groups within the community could marginalize certain community voices, resulting in their decreased involvement in decision-making processes.
Addressing community concerns

Cost and technical-expertise barriers have been overcome in Roslyn by establishing a partnership with RGIS–Pacific Northwest, which has acted as a GIS/DSS technology-training center and spatial data provider for the community. Previous PPGIS research has shown that similar strategies have been successful in bringing the benefits of decision-support technology to resource-poor communities.

To address sensitivity issues, volunteer community members, who are perceived to have greater understanding and sensitivity toward community entities, can be trained in the use of the DSS. These “technical chauffeurs” could then guide the use of decision-support tools, thereby preserving the community’s interests and ownership over the process.

Based upon Roslyn’s support and interest in Community Viz, RGIS-PN is currently training volunteer community members to incorporate GIS software and Community Viz into their decision-making framework. The hope is that Roslyn citizens will become progressively more engaged and gain a greater sense of ownership over their community’s decision-making process.

Future directions

Participant feedback in this project has been beneficial for determining participant-perceived strengths and weaknesses of a DSS, such as Community Viz. Feedback has provided valuable insight into how a DSS can be applied at the community level in a real-world, decision-making process. However, these technologies are not, in and of themselves, “decision makers.” They should be carefully applied in conjunction with other decision-support methods and tools. If integrated thoughtfully, they are a powerful means for helping rural community planners and citizens make sound land-use decisions.

The success of this pilot community project has aroused curiosity from nearby communities interested in incorporating the technology for their own spatial decision-making activities. Successful application in Roslyn could become a template for other rural communities to follow.

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This bulletin was produced by the National Consortium for Rural Geospatial Innovations. RGIS brings geospatial technologies and the benefits of the Information Age to rural America, where land is fundamental to rural economies and ways of life. Learn more about RGIS at www.ruralgis.org.

Additional support provided by the USDA Cooperative State Research Education and Extension Service (CSREES).