

BIOGRAPHICAL INFORMATION

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Specific Responsibilities

Bob serves as the Vice President of GIS Services for The Schneider Corporation identifying opportunities to deliver Schneider's innovative line of GIS services targeted at local governments, utilities and private industry.

Past Experience

With more than 30 years of professional experience, Bob has been involved with GIS production, consulting, and software related projects for 26 of those years. He has played an integral part in over 200 GIS projects for utilities and local government entities in the U.S., Canada, Europe and New Zealand. These projects represent over \$300 million in contracted services. Prior to his involvement in the GIS industry, Bob worked for an electric utility for 13 years where he developed and implemented computer applications and IT support systems.

Educational Information

BS, Electrical Engineering, Purdue University,
MBA, Indiana University, Finance

Professional Memberships

GITA
Indiana GIS Council, Homeland Security Group
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INNOVATIVE ECONOMIC DEVELOPMENT

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ABSTRACT

Communities faced with the challenge of attracting and retaining industrial and commercial businesses to increase economic development can increase their effectiveness and decision making processes through the use of GIS and 3D visualization. The ability to communicate visually proposed plans for developments, determine the potential visual impact on surrounding areas, and educate the public about how these proposed developments appear is simplified by allowing users to move through the project site, changing the displayed vantage point on the fly. 3D visualization acts as a design development providing users the ability to:

Interpret Proposed Plans in Context--Accurately portrays proposed improvements and allows a community to review plans and fully understand the proposal and its impact before anything is ever constructed.

Educate the Public--Promotes public education by providing an opportunity to visually explore the alternatives, in a hands-on, interactive manner.

Attract Business--Aids economic development by offering a realistic picture of proposed developments to attract businesses to a community.

Learn how 3D modeling interfaced with GIS helps overcome the challenges of economic development and enables community leaders to interpret proposed developments in context, educate the public on the proposed developments and promote visual aesthetic appeal.

INTRODUCTION

Across the country, communities continually develop vision statements that state a desire to grow and obtain prosperity while maintaining community values, quality of life and the environment. Leading communities are turning to GIS technology to turn these seemingly disparate goals into a unified plan. At the core of the technology development is modeling various economic development scenarios that merge demographic, economic, cadastral and infrastructure data which can be studied in order to make informed decisions.

Until recently, GIS has primarily been used for historical (that is backward-looking) applications. These are applications where using historical data is sufficient to empower the applications. The shift is to use GIS for forward-looking applications such as economic development. The driving factor in this shift is the realization that the ability to visually communicate each scenario along

with the ramifications is key to the use of technology for economic growth. The solution for many leading local governments is the integration of 3D, GIS, and Internet access to address and eliminate the problems imposed by geography.

A typical site selection involves complex tabular queries and spatial (theme-on-theme) analyses. This complexity makes it next to impossible to use a generic GIS as a powerful real-time analytical demonstration tool. Yet, the use of GIS with 3D for site selection and marketing typically offers the quickest return on investment.

This paper looks at the obstacles that impede the use of GIS for economic development, discusses changes in implementation to better facilitate use for economic development and presents two case studies using GIS for economic development applications.

OBSTACLES TO USING GIS IN ECONOMIC DEVELOPMENT

Three main obstacles faces by using GIS for economic development are the lack of visualization; the lack of accessibility to data and the concept that GIS is not easy to use. Planning commissions, developers, zoning boards, and financial institutions are accustomed to viewing plans either as a scaled 3D model or as architectural renderings. Data that may be available typically cannot easily be correlated (e.g. demographics and rent, demographics and mortgage rates).

The complexity of the systems and the processes and raw functionality of GIS have made it difficult to produce maps and reports for a typical user. Users are required to think like GIS technicians as compared to thinking like economic developers. Traditional GIS offers only the ability to produce 2D views that require studying and understanding symbology and line types in order to interpret the data. Now, through the use of 3D visualization, users receive superior multimedia and analytical presentations.

UNDERSTANDING THE IMPACT THAT INFRASTRUCTURE, LOCATION AND VALUATION HAS ON ECONOMIC DEVELOPMENT

Overstatement or understatement of infrastructure impacts location decisions and potentially a community's commitment to new businesses. The World Bank reported businesses in less-developed (that is, poor infrastructure) countries suffer as much as a 30% loss of profitability because public infrastructure is grossly inadequate. According to USDA statistics, 23 new jobs are created for every \$1M invested in electric infrastructure. Even though there are consequences of infrastructure there are yet no direct economic measures.

When the multiplier effect is taken into consideration, new manufacturing jobs create over three times as much return to the local economy as do service jobs: \$500,000 versus \$150,000 on average. This explains why many economic development organizations target the manufacturing sector heavily. However, it is not to say that other economic development strategies may not be more appropriate for a specific area. For example, such strategies may involve targeting tourism, software development, back offices or health care services.

Case Study 1 -- City Of Noblesville, Indiana

The problem Noblesville expressed was a desire to create a model for a corporate campus that could be proactively used for economic development. Their concept was to develop a digital model that would be an effective marketing tool used to attract business without requiring extensive trips and/or research to the area (that is, the model would be used to sell locally and nationally). Noblesville understood that eliminating site selection trips saved on analysis time, travel and money and at the same time kept everyone more focused inside and outside the company. The ability to model scenarios and view them with potential businesses would also speed up project turnaround time which ultimately would bring new businesses to the community faster. Noblesville was confident that as a direct result of this approach, an economic development research team would have an easier job justifying the community with a GIS to its executives and board of directors.

The model needed to be technically accurate in order to allow planning, engineering and construction analysis. The first phase of the model was designed to focus on an un-built corridor; however, the model needed the ability to expand and incorporate the remainder of the campus area. The plan included incorporating aerial photography and intelligence extracted from their existing GIS into the economic development model. Tools that allowed adding as-built information for construction in the campus area were recognized as needed.

The Noblesville solution was designed for users within the total enterprise. Noblesville wanted the solution to make effective use of 3D integrated with GIS and internet access as a way to reinforce their image of a leading-edge technology community. The solution needed to provide the “look and feel” of the corridor. It was decided to create two models in order to provide a visionary model as well as an existing model. The user interface requirements were defined simply to make the technology easy to use. The economic development user wanted to be able to turn layers/data on or off with a simple click. The criteria for acceptance was that the user must be able to navigate anywhere within the model within 2 to 3 clicks.

To better ensure universal access, the solution was designed to execute without requiring the installation and/or acquisition of additional software by any prospective user. The designed solution was to make the model accessible over the internet to any prospective realtor or business throughout the world. To accomplish the goal of universal access, the solution was designed for users that have either high or low bandwidth access. The high bandwidth access allows user interaction with the 3D model. A low bandwidth access provides a gallery of still pictures, and printed materials without interaction. The solution included a Wizard for first-time users that could be used for a preset demonstration and/or tour of the model. Beyond allowing access to traditional GIS information, Noblesville recognized the need to link to detailed information such as a contact for locations and detail about existing building sites. It should be noted that Noblesville also decided to create a website as well as a CD to increase the ability to distribute the data model.

As forward thinkers, the Noblesville community believed the portal for access was more important than the data. This is a different thought process than the traditional emphasis on protecting the investment in data.

CASE STUDY 2 – US 31 CORRIDOR IN CARMEL INDIANA

Carmel is one of the fastest growing communities in the US. The community goal was to protect their upscale image, preserve the environment, and maintain the quality of life without sacrificing economic prosperity. Within the community, US 31 is one of the main traffic arteries for commuter and merchandise transport. Increased traffic congestion was creating frustration for commuters and delays for product shipment while growth was being impeded by these situations. The problem was that the proposed solution from the controlling government entity for any changes to the US 31 corridor, the State of Indiana, negatively impacted the location of new businesses and did not fit the public relations “image” projected by Carmel.

As compared to the state, Carmel’s vision for the best solution was to use 3D and GIS together to portray a preferred solution. A main requirement was to illustrate new engineering concepts of entrance and exit ramps in order to gain public approval and support. An additional goal of the solution was to assist potential businesses in determining location. The results of the Carmel solution not only gained State approval but also were instrumental in securing institutional businesses in the form of hotels and restaurants at entrance and exit locations.

CONCLUSIONS AND RECOMMENDATIONS

The impact of large factories on a local economy can amount to billions of dollars over the life of the plant. If GIS helps achieve a positive decision towards locating one of these plants in a community, their GIS and years of hard work are paid at once.

An application-oriented multimedia GIS is needed to take full advantage of GIS in industrial site selection.

System design must be centered on the requirement of 3D visualization, GIS, and Internet access being tightly coupled. This multimedia GIS is the best technology to deal with eclectic and location-based site selection data. It offers the benefits of traditional database and multimedia systems while adding powerful spatial, analytical, map publishing and data integration capabilities.

Solutions should include multiple view options to accommodate low bandwidth and high bandwidth users. The high bandwidth model should include animation and sound. Within the model, include metadata, legacy data, and links to other systems.

Think regionally not just locally. That may require development of regional standards to allow accessibility. Look for other sources of data beyond the typical census data which may not be the most current data available.

Keep an inventory of available locations. Include contact information for the location and include information about the site or links to the site. Many relocating or expanding companies have short product cycles and therefore cannot take the time to build facilities from the ground up. Therefore, they often focus exclusively on existing buildings. Communities without available or appropriate buildings find themselves at a strong disadvantage. To remedy to the situation, they may build a facility before finding a buyer or tenant. This is a risky but sometimes

necessary strategy. Even when buildings are well designed and are expandable, they may stay on the market for years if they are not well located. GIS can help reduce this risk by selecting the right location.

Think as an economic developer not just a GIS expert. The result will be implementation of an application-oriented GIS accessible to every economic developer involved in the community. Application oriented GIS implies a focus on applications, empowered by the GIS, as compared to back-office GIS or tool box GIS. The applications oriented GIS has important characteristics missing in traditional GIS including ease of use through extensive use of forms and close focus on the economic development process; speed, thanks to the built-in economic development functionality; and a consistently professional and pleasing look. To further enhance the economic development model, consider spatial area characteristics (e.g. location of schools, zoning, crime statistics).

For economic development and enterprise users, good addresses are needed. What is good for tax mapping purposes is not sufficient for public safety, economic development or other critical and forward-looking systems. When designing the ideal solution, consider true enterprise-wide needs for address accuracy. Economic development involves a lot of other players: location consultants, engineering firms, lawyers, lawmakers, planners, commercial real estate agents, the society as a whole and, obviously, the expanding or relocating companies.

Because the valuation of infrastructure impacts the economic development scenarios and potential community investment in an economic scenario, the community should compute asset value based on life cycle cost. Life cycle cost includes more than design and construction costs. It also includes maintenance and operations cost. This gives a truer picture of the infrastructure's value and the ability of the infrastructure to provide required service levels for new businesses. True value of infrastructure impacts economic decisions.

For the future, start thinking about how to depict a time-series of data. Right now there is no available data to support the time-series model. Additionally no software for analysis is currently available.

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