

Planning Is the Key to Success for Community Fiber Projects

Bringing advanced telecom services to an entire community is a complex undertaking. The standardized process developed by the authors helps planners ask and answer the right questions, in the right order.

By James Goldman ■ *Purdue University*, Brent Engle ■ *InfoComm Systems*, and Stephen Mayo ■ *Inteleconnect*

Planning a communitywide telecommunications project requires grappling with many kinds of complex issues. Solutions that work in one community may fail in another due to variations in state and local laws and economic development philosophies. What can planners do to assure the success of their fiber-to-the-home or fiber-to-the-curb initiatives?

The instinct of many would-be system builders is to jump straight into the technical details. But as fascinating as these issues may be, they are the wrong place to start. Planners first need a “big picture” to provide the underpinning for the technical details; they also need to address managerial and financial issues that are every bit as critical to the project’s success as the technology is.

In our experience with more than 30 deployments, we have developed a standardized planning process that ensures that planners address the right issues in the right order, while accommodating all of the local variations that planners are likely to encounter. Using such a standardized planning process yields higher success rates, more satisfied clients and fewer unpleasant surprises.

MetroMorphosis: Planning from Strategy to Operations

Our planning process, called MetroMorphosis, can be used effectively for communitywide fiber, wireless or FTTH/FTTC projects, whether in a municipality or a new development. It can also be used for telecom projects that serve government and educational

facilities, public safety agencies or commercial customers.

Unlike some other planning tools, MetroMorphosis produces outcomes that are specific and detailed enough to convert into concrete action. The multi-layered approach to planning illustrated in Figure 1 ensures that broad applicability does not result in the loss of important detail.

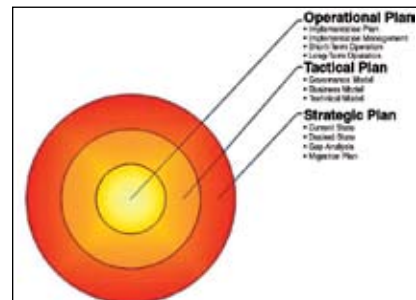


Figure 1. Multi-layered Approach to a Standardized Planning Process

The planning process starts with strategic – high-level, long-range – planning; works through detailed design and implementation; and concludes with planning for steady-state operations.

The **Strategic Plan** provides detailed analyses of the current state and desired state of the telecommunications climate, then compares the current with the desired state in order to identify where the current state falls short. A migration plan is developed to address these gaps and chart a critical path toward development of the desired state.

- The **Current State Assessment** provides a level set for project

consultants and coordinators. It clarifies the current telecommunications environment, the potential impact of FTTH/FTTC, the existing processes for using telecommunications to spur economic development or home sales, and the developer’s ability to support major projects.

- The **Desired State Assessment** paints a picture of the optimal telecommunications environment. In this step, planners provide strategic direction by outlining requirements for the new telecommunications platform. These requirements include current and future goals and needs of community residents and the education, government, industry and social service sectors.
- During **Gap Analysis**, planners compare the current state with the desired states of the telecommunications, administrative support and regulatory environments. The outcome of this step shows where changes need to be made and provides insights into how to move forward.
- The **Migration Plan** consolidates recommendations into a concise plan of attack that charts a critical path toward the deployment of FTTH/FTTC or another telecommunications platform.

The **Tactical Plan** may follow the strategic plan immediately or after a hiatus of months or even years. It addresses

the detailed governance, business and technical aspects of telecommunications infrastructure design. It includes steps such as right-of-way preservation, RFI/RFP development and process management, detailed outside plant design, network engineering and financial feasibility analysis.

The **Operational Plan** covers implementation and deployment of the telecommunications infrastructure, along with associated project and resource management issues. It also addresses what is needed to run and maintain the infrastructure – everything from staffing and customer service to day-to-day network operations.

A 360-Degree View from the Telecommunications Platform

In our experience, planning for telecommunications projects typically centers around technology and engineering issues. But a planner who ignores or shortchanges financial, administrative, management, governance and regulatory issues runs the risk of ending up with a project that is technically feasible but ultimately cannot be implemented.

We have adopted the term “telecommunications platform” to refer to the 360-degree view encompassing all the relevant aspects of the project. A telecommunications platform is a means for encouraging the deployment of telecommunications and services in a region or development.

A municipal telecommunications platform can benefit economic development both directly and indirectly. These benefits depend on the community’s size and its specific goals, but certain benefits are independent of scale and scope:

- Simply by gathering information about business and residential demand for telecommunications services, a community or region appears in vendors’ eyes as a place that is easier to do business with.
- Providing ubiquitous connectivity (access, capacity, and service) throughout the community eliminates the digital divide.
- A competitively neutral telecommunications infrastructure removes artificial barriers to entry for competitive service providers.

- The community gains more influence over service quality and public rights-of-way permitting.
- The community’s awareness and documentation of its telecommunications infrastructure and services helps keep future initiatives aligned with its goals. The telecommunications platform is a

proactive approach to providing telecommunications services to meet present and future needs.

The Planning Matrix

The three layers of planning – strategic, tactical and operational – can be combined with the three legs of the telecommunications platform – technical,

Planning Component	Technical	Business/ Financial	Governance, Management & Regulatory
Strategic Plan	<ul style="list-style-type: none"> • Identification of incumbent and potential competitive service providers • Capabilities/ assets/ services of potential partners • Restrictions on use of assets/ capabilities of any potential providers • Assessment of relationship with service providers • Desired technical outcomes 	<ul style="list-style-type: none"> • Definition of vision and purpose of the project • Desired economic development outcomes • High-level business model • Identification of funding sources and associated requirements and restrictions 	<ul style="list-style-type: none"> • Investigation of applicable federal, state and local regulatory issues • Identification of potential stakeholders • Evaluation of alternative organizational structures
Tactical Plan	<ul style="list-style-type: none"> • Detailed network design and engineering • RFP (Request for Proposal) development leading to selection of vendor(s) and service(s) 	<ul style="list-style-type: none"> • Initial funding plan and budget • Projected revenue model 	<ul style="list-style-type: none"> • Memorandum of understanding re: organizational structure • Necessary legal work
Operational Plan	<ul style="list-style-type: none"> • Implementation project management • Network management 	<ul style="list-style-type: none"> • Customer service and billing/front-office operations • Financial management/back-office operations • Marketing 	<ul style="list-style-type: none"> • User group forums • Rate setting and analysis

Figure 2. The planning matrix is a framework for organizing a large number of activities.

business/financial and governance/management/regulatory – to form a 3x3 planning matrix. Figure 2 illustrates some of the activities appropriate to each cell of the matrix.

**Using the Planning Process:
Dealing with Service Providers**

One activity that should begin during

the strategic planning stage is consideration of how the community will work with service providers. Typically there will be a state-regulated telephone company (ILEC, or Incumbent Local Exchange Carrier) and a locally franchised cable television operator (MSO, or Multiservice Operator) already serving the community. A new community may ac-

tually intersect two or more of these service providers. It is essential to establish agreements with service providers and have a documented plan for access and service provisioning for the entire area.

This can become quite complicated. For example, in one new development we are working with, the territory is divided between the service areas of Incumbent Telco A and Incumbent Telco B. The front half and entry to the development is in Incumbent A’s service area, while the back half is in Incumbent B’s service area. Incumbent B says it has no public right of way available to serve the community, but Incumbent A will not serve the community unless Incumbent B will release the property to them. Incumbent B will not release the property without an exchange of an Incumbent A service area elsewhere, which Incumbent A will not provide. As of now, the homeowners do not have access to telephone services from either company.

Developers of new communities have several options for dealing with service providers. They can negotiate better deals with incumbents in exchange for exclusive marketing agreements that give them first access to the new homeowner. For example, they may ask for free services in recreation buildings and sales offices, or for wireless coverage in community open spaces.

Developers also have the option of bringing in private telecommunication companies or competitive local exchange carriers (CLECs). A CLEC may be a company that is not incumbent anywhere, or it may be the nonregulated side of an ILEC. Typically, private service providers will propose a complete triple-play package (telephone, video and Internet) including on-property infrastructure.

Another, more recent type of provider will build and operate a fiber-to-the-home backbone on the property and contract with multiple service providers to bring services to the community. There are many possible types of agreements. Typically these providers offer a discounted package of services, fiber-to-the-home infrastructure, and exceptional customer service in exchange for

Planning Success Story: Anson, Indiana

Asset	Leadership / Oversight	Management Mechanism(s)	Revenue / Investment Mechanism(s)
• Conduit duct system	• Developer • Consultants	• Contracted maintenance to service providers	• Asset exchange • Free conduit duct for the developer

Anson is a master-planned community in central Indiana. The developer envisioned telecommunications as a key driver for businesses and residents to locate in the newly formed community and therefore commissioned the creation of a telecommunications master plan. The master plan included a design for a five-conduit fiber system with 4-inch conduits that would serve as a backbone platform for service providers to roll out fiber-based voice, video, and data services.

Putting the conduit in the ground at the outset would preserve the integrity of public rights of way and easements, and also preserve the aesthetics of the newly constructed roads and landscaping throughout the community.

The conduit system design was released in an RFI sent to telecommunications service providers. Of the dozen responses received, two service providers were selected to utilize the conduits: the incumbent telephone and cable companies.

Because the developer did not want to incur the ongoing costs of owning and operating the conduits, it proposed the following memorandum of understanding:

1. The developer would agree to market both service providers as “preferred providers.”
2. The developer would allow the service providers to locate portions of their infrastructure within developer-owned rights of way.
3. The developer would include the conduit system in a joint-trenching effort to save time and money during utilities construction.
4. The service providers would adjust the conduit design to their specifications, within reason, and would fund and manage its construction themselves.
5. The developer would receive ownership of one conduit to hold for a yet-to-be-determined future private use, to further supplement telecommunications and technology in the community.

By leveraging its advantages of private easements and marketing opportunities, the developer was able to negotiate a communitywide conduit system and its own duct – at the very least, an asset with significant cash value.

exclusivity, a long-term contract of five to 10 years, and a fixed service fee, typically from the homeowner association.

Issuing a Request for Information (RFI) early on may provide enough information to help determine the correct technology plan for your development. This process should define the goals of the developer and the capabilities and costs of the service providers who are most likely to be successful in this project.

In a new community with public streets and access, incumbent providers have the option to be included in the rights of way and to service the new residences. The developer can also choose to

Planning a communitywide telecommunications project requires grappling with many kinds of complex issues. Solutions that work in one community may fail in another due to variations in state and local laws and economic development philosophies. What can planners do to assure the success of their fiber-to-the-home or fiber-to-the-curb initiatives?

include other service providers within the community. If the streets are public, the incumbents are usually bound to provide services, although there is some flexibility with regard to expense to reach the community with facilities. Different states and service providers may have different policies on construction.

If the new community will have private streets, the incumbents are still usually required to provide services – again, the policies concerning construction expenses may differ according to state and service provider. However, the developer can decide to use competitive service providers along with or instead of the incumbent providers. If the developer chooses to exclude the incumbent service providers, they are released from their obligations to serve the community as the provider of last resort.

Allocation of the costs for bringing infrastructure into a new community varies from state to state and among service providers. Typically the developer is responsible for providing a utility easement to each home and an “open trench” for installation of services such as power, telephone and CATV. It is still common for service providers to direct-bury copper/coax cable into developments, although in targeted growth markets there is a trend toward also including a small conduit for installing fiber at a later date.

If the development is going to use a direct-buried copper/coax solution, the developer should strongly consider adding a “shadow” conduit for the future.

Planning Success Story: St. Joe Valley Metronet

Asset	Leadership / Oversight	Management Mechanism(s)	Revenue / Investment Mechanism(s)
<ul style="list-style-type: none"> • Conduit duct system 	<ul style="list-style-type: none"> • Board of Directors • Consultants 	<ul style="list-style-type: none"> • Condominium fiber model • Owned and operated by private entities 	<ul style="list-style-type: none"> • Asset exchange

St. Joseph County, located in northern Indiana, is home to the University of Notre Dame and other private colleges. Building on its educational assets, St. Joseph County has positioned itself as a regional center for telecommunications.

In 2001 the St. Joseph County Economic Development Corporation, looking to capitalize on economic and workforce development, began investigating the potential regional effects of advanced telecommunications. This effort yielded a telecommunications strategic plan for St. Joseph County. The largest telecommunications users in the region, when consulted for their feedback on the plan, said they wanted access to dark fiber, which was largely unavailable in St. Joseph County at that time. From this request, the concept of a dark fiber infrastructure – now known as the St. Joe Valley Metronet – was formed.

The mission of St. Joe Valley Metronet (SJVM) is “to encourage technology-based economic development by providing state-of-the-art telecommunications infrastructure at cost-effective prices.” Its goal is to offer readily available, cost-effective access to high-speed telecommunications for local businesses, education and healthcare institutions, and government agencies.

As a nonprofit company initially funded by seven local stakeholders, SJVM provides a dark fiber network (that is, fiber with no electronics or services) utilizing existing municipally owned conduit. The infrastructure is carrier neutral and vendor independent, and is connected to neutral points of presence with multiple service provider alternatives. Currently, more than 20 service providers offer services on the network. Fourteen different services are provided, including a rich array of business services beyond the “triple play.”

Certainly in any mixed-use development or master-planned community the developer should consider including a central connection point (building, vault, room in a common-space building, and so forth) where services providers can connect their off-property services. This central site would also be the point where all conduits connecting the buildings within the development con-

nect. The developer can then negotiate agreements with service provider for use of this “private” infrastructure.

Selecting Services

Today it is common to see cable television/Internet packages from MSOs and DSL telephone/Internet packages from ILECs. (Of course, there are still many rural markets where neither DSL

nor cable modem services are available.) In urban and developing markets, incumbents have introduced “triple play” packages with rate advantages to customers choosing all three services. Comcast, Cox and other cable operators have added VoIP telephone services, while companies like Verizon with its FiOS service have added video.

Services are typically negotiated as part of the vendor selection process as an outcome of RFP development in the tactical phase of MetroMorphosis. A list of potential services to be offered to residents of a development could include any or all of the following:

- Telephone, including local and long distance calling and custom calling features
- Internet access and email
- Television, including not only linear channels but gaming and Video on Demand channels
- Security
- Community intranet
- On-site technology support
- In-home technology packages including wiring, whole-house audio, installation of flat-screen TVs, intercoms, medical alerts, and integrated “connected home” packages.

Detailed in the sidebars are several success stories illustrating the results achieved from following a complete and coherent planning process. The localities described here have been able to work constructively with providers to develop telecommunications infrastructures that provide valuable assets, world-class services and economic development for their communities. **BBP**

About the Authors

James Goldman is Professor and Associate Department Head, Purdue University (www.tech.purdue.edu/cit). He can be reached at 765-494-9525. Brent Engle is Senior Network Engineer at InfoComm Systems, Inc. (www.infocommsystems.net). He can be reached at 765-497-3090. Stephen Mayo is President, Inteleconnect, Inc. (www.inteleconnect.com), and can be reached at 734-944-6694.

Planning Success Story: Columbus, Indiana

Asset	Leadership / Oversight	Management Mechanism(s)	Revenue / Investment Mechanism(s)
<ul style="list-style-type: none"> • Conduit duct system 	<ul style="list-style-type: none"> • Oversight Committee • Consultants 	<ul style="list-style-type: none"> • Contracted maintenance to service providers 	<ul style="list-style-type: none"> • Revenue sharing

Columbus is located just south of Indianapolis in south central Indiana. To promote the city's attractiveness and economic viability, Mayor Armstrong and his Technology Advisory Committee created the eCOLUMBUS initiatives, including:

- The Greater Columbus Conduit System
- Wireless Columbus
- FTTC (Business)
- FTTH (Residential)
- Inter-Community Fiber

The city defined its goals as achieving world-class status for its telecommunications infrastructure and services; ensuring that Columbus residents, businesses and visitors have readily available access to reliable world-class voice, video and data services at a reasonable price; creating an economic advantage for Columbus residents, businesses and visitors; and encouraging commerce and economic growth.

In addition, Columbus anticipates that eCOLUMBUS will provide benefits such as improving public safety communications, awareness and responsiveness; promoting innovative solutions for Columbus consumers; improving visitors' experience of Columbus; and promoting Columbus's brand and image.

In the summer of 2007, the Greater Columbus Conduit System was created to encourage the deployment of fiber based services to Columbus businesses and residents. Selected via an RFP process, Smithville Digital was selected to offer FTTC service to the community utilizing the Greater Columbus Conduit System.

In this newly created public-private partnership, the City will be responsible for building out the Greater Columbus Conduit System backbone and providing Smithville Digital an easement to maintain and utilize this infrastructure. In exchange for granting this easement, the city will share in the revenues generated by Smithville Digital's use of the system for FTTC deployment. Smithville Digital will build out the last-mile FTTC network to customers and will be responsible for all network design, installation, operations and customer service.



An open network, a world of choice

In an open-access broadband network powered by PacketFront, users are free to instantly choose from multiple competing services – not just a select few. Network operators benefit from greater profitability through lower operating costs and increased revenues per user. As pioneers of open-access, we're leaders in municipal FTTH deployments. And with multiple deployments around the globe, we're transforming communities and broadband businesses. Everywhere.

OPEN UP