

# INFORMATION TECHNOLOGY

## *Telecommunications Networks and Computer-Based Services*

### GOAL

Promote universal, affordable open access to information technology (IT) infrastructure and telecommunication services at a globally competitive level to ensure an improved quality of life and economic opportunity in a networked world.

### BACKGROUND

Historically, communities located near transportation networks—oceans, rivers, railroads, highways, and skyways—enjoyed economic growth because agricultural and industrial goods, if not produced there, at least passed through on the way to market. Primarily because they were positioned to provide access to needed infrastructure and services for aggregated commercial activity, such communities grew, increasing wealth and improving quality of life for many. A hundred years ago, with respect to transportation, this goal might have read to “promote universal, affordable open access to rails and roads and the services that can be reached by them.” Eighty years ago, with respect to Electricity and Telephony, it might have read to “promote universal affordable access to electricity and telephone services.” Clearly, any community that did *not* fulfill these goals had difficulty competing economically with those that did.

The same principle applies today regarding information technology. The difference is that, in a networked world, in a technology-intensive global economy, people and capital need *not* be physically co-located with the businesses and industries they serve. One can enjoy the best of both worlds: the quality of life in a place like Blacksburg *and* many of the services and economic opportunities available in large cities. However, one can do this only if:

- a) the Town’s IT infrastructure becomes and remains globally competitive; i.e. connected to, and on a par with, high speed global networks (Internet2 and National Lambda Rail), and
- b) the Town’s leaders—civic and business—take advantage of the opportunities such infrastructure provides.

Most components of municipal infrastructure—water, sewer, electricity, and roads—are relatively static, governed by well codified technical and legal standards. In addition, models by which municipalities can provide such utilities are well understood. Not so with Information Technology. Not only is IT dynamic, it is pervasive and unique such that all departments have their own IT-related goals that can be met only through specialized IT systems and applications. All of these needs must be considered in the Town’s overall planning processes. Though implementation strategies will be vastly different, the Town must plan for information technology with an effort comparable to that directed toward other critical municipal infrastructures, just as for water, sewer, electricity, and roads. A first step in this endeavor is illustrating the Town’s existing fiber network and prioritizing needed key connections. The Town’s fiber network should complement other public or private existing fiber networks located within Town on the Virginia Tech Campus or the Virginia Tech Corporate Research Center.

In preparing for the future, the Town must monitor the following developments:

**1. Technological Convergence:** Traditional information and media technologies continue to merge into a single new (digital) medium. That medium consists of *infrastructure* (networks, computers, and other devices that move, store, and manipulate data) and *services* (the interactions and transactions available via that infrastructure, such as voice, video, and the World Wide Web). All of these services are now digitized and can technically be delivered over any physical network infrastructure: today, the traditional telephone network (twisted pair copper), traditional radio- and television- type networks (wireless or coaxial cable), the electrical network with broadband over power lines (BPL), and even broadband over gas lines.

**2. Pervasive and Increasing Demand:** The proliferation of network applications, for both commercial and government services, and the pervasiveness of devices that can use them, guarantee increasing demand for both network access and capacity. All other things being equal, communities in which residents can be “always on” a reliable, secure network with adequate capacity will improve their chances to prosper in the new economy.

**3. National Public Policy:** Today, our telecommunications networks are proprietary: that is, they are open only to those who can afford to rent access from and pay tolls to the owner. They also are more expensive than comparable services in other developed countries. Even now, a national debate is engaged. Will our national information technology policy

- a. be like our transportation policy: promoting open and unfettered access to roads and highways and to all competing businesses and services located thereon, hence providing an “information superhighway” as a *public good* for residents;
- b. leave the infrastructure as it is today: in the hands of private enterprise (i.e., mostly the telephone and cable companies) and hence, a *private good*, an “information super-toll-road,” available only to those who pay the toll, and possibly with access to only those services whose providers have themselves paid a toll to *be* accessible; or
- c. be a hybrid that will evolve over the years ahead.

**4. The Role of the Town:** Regardless, social and economic prospects in the community, and quality of life, will be affected by actions at the national, state and even the local level, the impacts of which may include, but are not limited to:

- a. limiting local control over rights-of-way with respect to commercial IT build-out requests,
- b. eliminating or bypassing franchise fees as a source of local revenue,
- c. expanding Universal Service Fees to cover more than telephone service, and
- d. prohibiting municipalities from providing IT infrastructure and services to the public.

The Town must follow this debate carefully as part of its planning.

Insuring the availability to citizens of critical utilities is a civic responsibility. Assuming this responsibility for IT requires methodologies for assessment, planning, and operations analogous to those for other utilities. Such a methodology must address questions of *infrastructure*, *services*, and *access* that include, but are not limited to, those below, while taking into account that the answers may change at any time:

### **1. Municipal IT Infrastructure:**

- What is legal and what policy adjustments will the law permit/demand?
- If the Town may play a role in providing IT infrastructure:
  - a. What should the Town's IT infrastructure look like?
  - b. Should the Town build and operate its own infrastructure or not? In either case:
  - c. Should it provide infrastructure for its own operations (internal)?
  - d. Should it provide infrastructure to service providers and citizens (external)?
  - e. How may and should it handle access to its rights of way?
- What new revenue models will be possible?
  - a. Should the Town be leasing infrastructure *to* or *from* private providers?
  - b. What other arrangements with private providers should be considered?
- How will the Town track change, evaluate its status, plan, and manage for these possibilities?

### **2. IT Services:**

- What IT services should the Town itself provide?
- What IT services should the private sector provide?
- What services should be provided at no direct cost to the customer?
- For which services should cost be recovered?

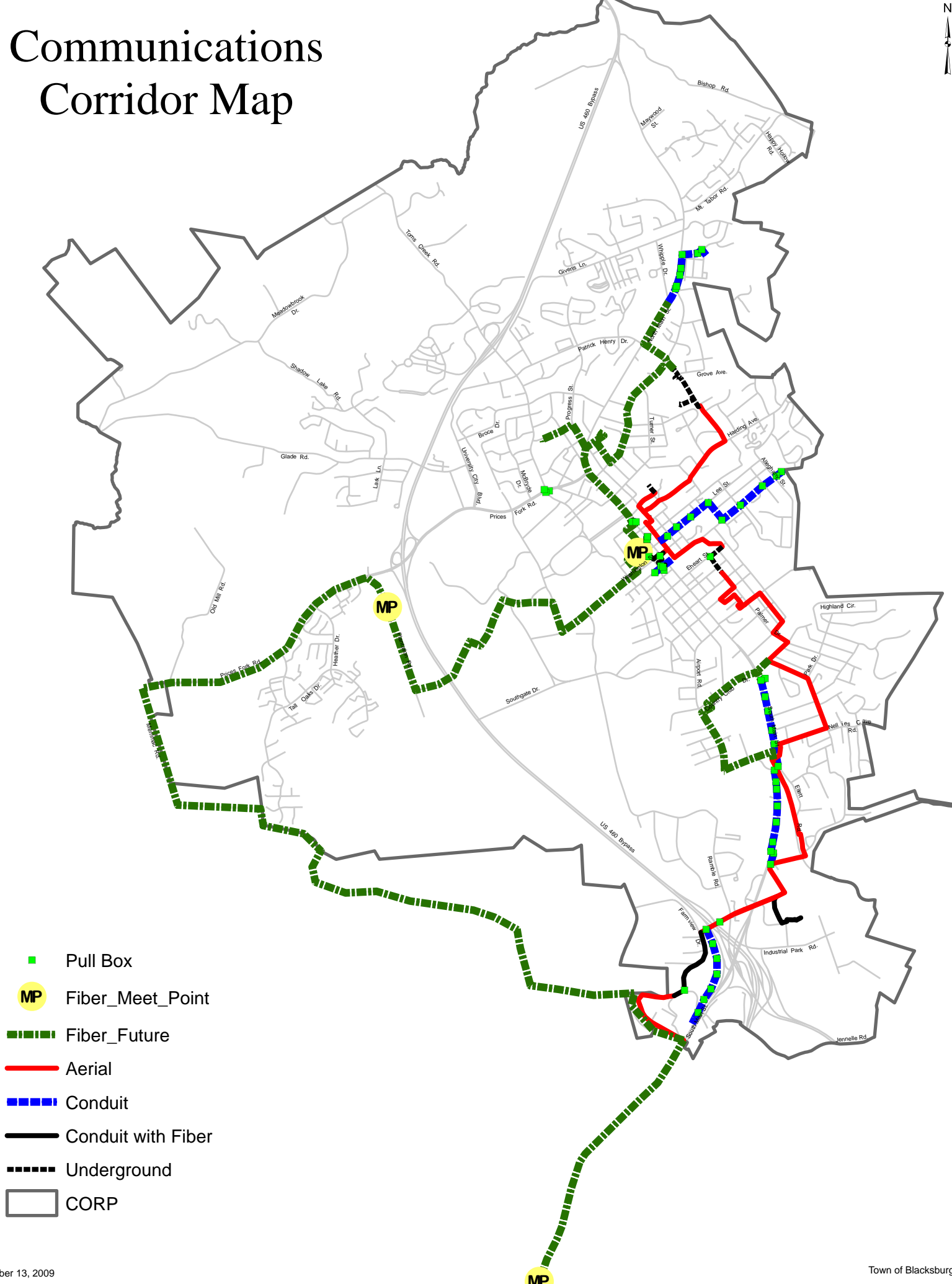
### **3. Access:**

- What responsibility does the Town have to be sure all citizens have access?
  - a. To infrastructure?
  - b. To some or all services?
- How will the Town fulfill these responsibilities?

Just as the Town's transportation and utility infrastructure networks are carefully designed, maintained and expanded, the Town's information technology infrastructure network needs to be designed, maintained and expanded. This holistic management approach to infrastructure planning is just one example of the Town's information technology innovative achievements that complements the Town's economic development and environmental sustainability goals.

Expansion opportunities of the Town's fiber infrastructure network can occur through public, public/private or private development projects. The Communication Corridor Map that follows on the next page illustrates existing and future fiber & conduit locations within the Town of Blacksburg. The Communications Corridor Priority Construction Chart, located in the Blacksburg Administrative Manual, details key connections needed to complete the fiber infrastructure network within the Town. Any proposed development within the Town should be reviewed and evaluated for conformance, as well as for possible network expansion opportunities as illustrated in the Communications Corridor Map and detailed in the Communications Corridor Priority Construction Chart.

# Communications Corridor Map



## **INFORMATION TECHNOLOGY COMMUNITY FACTORS**

- The Town of Blacksburg has been widely recognized for information technology achievements and sees itself as an innovative leader in connecting members of the community to one another, and to the world, via the Internet.
- The Blacksburg Electronic Village (BEV) is a unique vehicle for implementation of cooperative community technology projects.
- Virginia Tech, the Town's largest corporate citizen, is a source of cutting edge technology and national political leverage. A strong partnership is highly advisable.
- The Virginia Tech Corporate Research Center, already home to more than 100 companies and growing at a healthy rate, is both a magnet and an incubator for enterprises in the computer technology, biotechnology, and wireless communications fields, among others.
- While the community is highly connected in many locations, a “digital divide” still exists between social-economic classes and across generations.
- Citizen expectations for network-based, on-demand services are increasing and will continue to increase as E-commerce applications become more prevalent and drive up demand for access and bandwidth.
- To be economically competitive and to satisfy local demand for converged services, fiber optic lines need to be available to homes and businesses and to keep pace with both Virginia Tech's infrastructure upgrades and the rollout of such technology in larger metropolitan areas.
- An enhanced technology network supports the implementation of the Town's environmental sustainability goals by promoting economic opportunities that reduce air pollution by lowering the number of miles traveled by vehicles.
- In the more urban areas of Town, site design for new development and redevelopment does not always optimize opportunities to expand the Town's fiber optic network.
- Because of Blacksburg's Tier III status (small market size), large incumbent telecommunications companies have traditionally been slower to provide new infrastructure and services here as opposed to Northern Virginia areas that promise higher returns per dollar invested. To date, no commercial announcements, no plans, no requests to the Town, and no projects have begun with developers related to Fiber to the Premises (FTTP) in Blacksburg.
- As a regional initiative, the New River Valley Planning District Commission is actively pursuing collaborative relationships with telecommunications providers. Blacksburg's participation strategy is not yet clear.
- Issues of security, privacy, and identity authentication are of critical importance as the Town implements technology initiatives.
- Although demand for wireless communication services is high, telecommunications towers are difficult to locate, often creating conflicts between citizens and wireless providers.

# **INFORMATION TECHNOLOGY**

## **Objectives and Action Strategies**

- A. ***Envision it:*** Establish and maintain a vision of, and goals for, the Town's globally competitive IT infrastructure and IT-related services.
1. Establish and execute a visioning and planning methodology in collaboration with appropriate partners, focusing on the needs of people, businesses, industry, governments, educational institutions, and non-profit groups rather than on technology itself.
  2. Share goals and objectives and conduct joint planning with and among commercial service providers.
  3. Coordinate and collaborate with private enterprises in helping to meet Town IT infrastructure goals.
  4. Determine the benefits and costs to the Town, versus private entities, of owning and providing IT infrastructure and/or services.
  5. Help reinvigorate and use the Blacksburg Electronic Village as
    - a) a liaison between the Town and the university with respect to IT planning and needs, and
    - b) a field laboratory for experimentation with IT infrastructure and services with vendors.
  6. Strengthen the partnership with Virginia Tech and the BEV on an ongoing basis for joint technological planning, consulting, and investment.
  7. Support innovative technology-based economic development opportunities.
- B. ***Build it and Share it:*** Establish public and private partnerships to undertake projects connecting any major public or private facility with fiber optic services.
1. Support the New VA Corridor Technology Council and other regional telecommunication organizations as they work to build IT-related relationships in the region.
  2. Participate in the NRVPDC telecommunications initiative to establish fiber connectivity to all localities in the NRV.
  3. Continue to partner with Virginia Tech and BEV and surrounding jurisdictions to further the community's technology infrastructure.
  4. Encourage private developers and builders to consider telecommunications infrastructure in their planning, specifically the installation of Fiber-to-the-Premises.
  5. Assist and encourage utility providers to cooperate with mutual undergrounding of conduit and other assets to assist the private sector builders.
  6. Explore the possibility of a conduit bank for open access use by any telecomm utility or other entity.
  7. Coordinate with the Montgomery County Public School System to ensure the needed information technology services and infrastructure are accessible.
  8. Create government-to-government connections between information systems in Montgomery County and at the state level.
  9. Complete the connection of all Town facilities with fiber optic cable.
  10. Arrange for ubiquitous open wireless access in Downtown at no charge to the itinerant user: a "wireless village."
  11. Facilitate the creation or expansion of community technology centers allowing public access to technologies that may not be available in the home.
  12. Encourage active participation and financial support of WTOB by the cable franchisee(s) and other telecommunication service providers.

13. Establish a technology training facility for Town employees.
  14. Review and amend the Zoning Ordinance to require development plans submitted for review and approval to incorporate Information Technology infrastructure such as conduit and pull boxes and easements for future connections.
  15. Pursue opportunities to install Information Technology infrastructure in maintenance or new construction projects by the Town, Virginia Tech or other government entities.
- C. **Use it:** Apply infrastructure and applications to make the municipal workplace and technology services better, faster, or less expensive; and to provide services that cannot be provided any other way.
1. Have all departments establish a prioritized list of their IT-related needs, projects, services, and investments to guide each department independently and the Town's collective IT investments.
  2. Continue to upgrade the Town's website to implement the latest technology advances, including making technology services more accessible with on-line registration and payment for all Town services and programs.
  3. Continue to expand GIS services internally to staff and externally to the general public via services such as Blacksburg WebGIS.
  4. Continue the transition toward paperless communications for all Town of Blacksburg processes.
  5. Continue to upgrade on-line virtual Town Hall meetings, including additional meeting space designed for digital recording.
- D. **Monitor it.** Regularly assess the Town's IT situation, monitor performance of infrastructure and services, and adjust activities as necessary:
1. Review the role of the Blacksburg Telecommunications Advisory Committee (BTAC) as a policy and oversight committee to promote and monitor the use of information technology and telecommunications in the Town.
  2. Study the feasibility of establishing regular reports and recommendations to Town Council on the Town's progress toward Stage 4 as defined by the Computer Systems Policy Project "Living in a Networked World" Readiness Guide ([www.cspp.org](http://www.cspp.org))
  3. Maintain a Technology Opportunities Table as a single instrument in which the Town can cost and prioritize needed IT-investments, both infrastructure related and from the departmental lists (see C.1. above).
  4. Ensure that all Town communications and technology infrastructure and services remain intact and operational during emergency situations.
  5. Monitor the location of existing fiber optic cable/conduit in the right-of-way and promote the continued expansion of the fiber optic cable conduit system within the Town.