



Danville's Fiber Optic Broadband Municipal Area Network

Introduction: The City of Danville is constructing Network Danville (“nDanville” for short), a sophisticated fiber optic broadband network over which digital data, voice, and video signals can be transmitted from point to point in Danville at very high speeds, as well as to and from worldwide locations via the internet. Construction will be completed by the end of the summer. The municipal area network is anchored at the eDan Multimedia Service Access Point (MSAP) located at the Galileo Magnet High School at 230 South Ridge Street. nDanville will connect there to MCI’s high-tier national internet backbone. Fiber optic cables will radiate from the MSAP to schools, municipal buildings and facilities, and utility infrastructure components at approximately 100 locations over a 70-mile route. nDanville will share cabling with the Future of the Piedmont’s “eDan” to the north and with the Mid-Atlantic Broadband Coalition’s “e58” to the east and west.



nDanville will enable distance learning in schools.

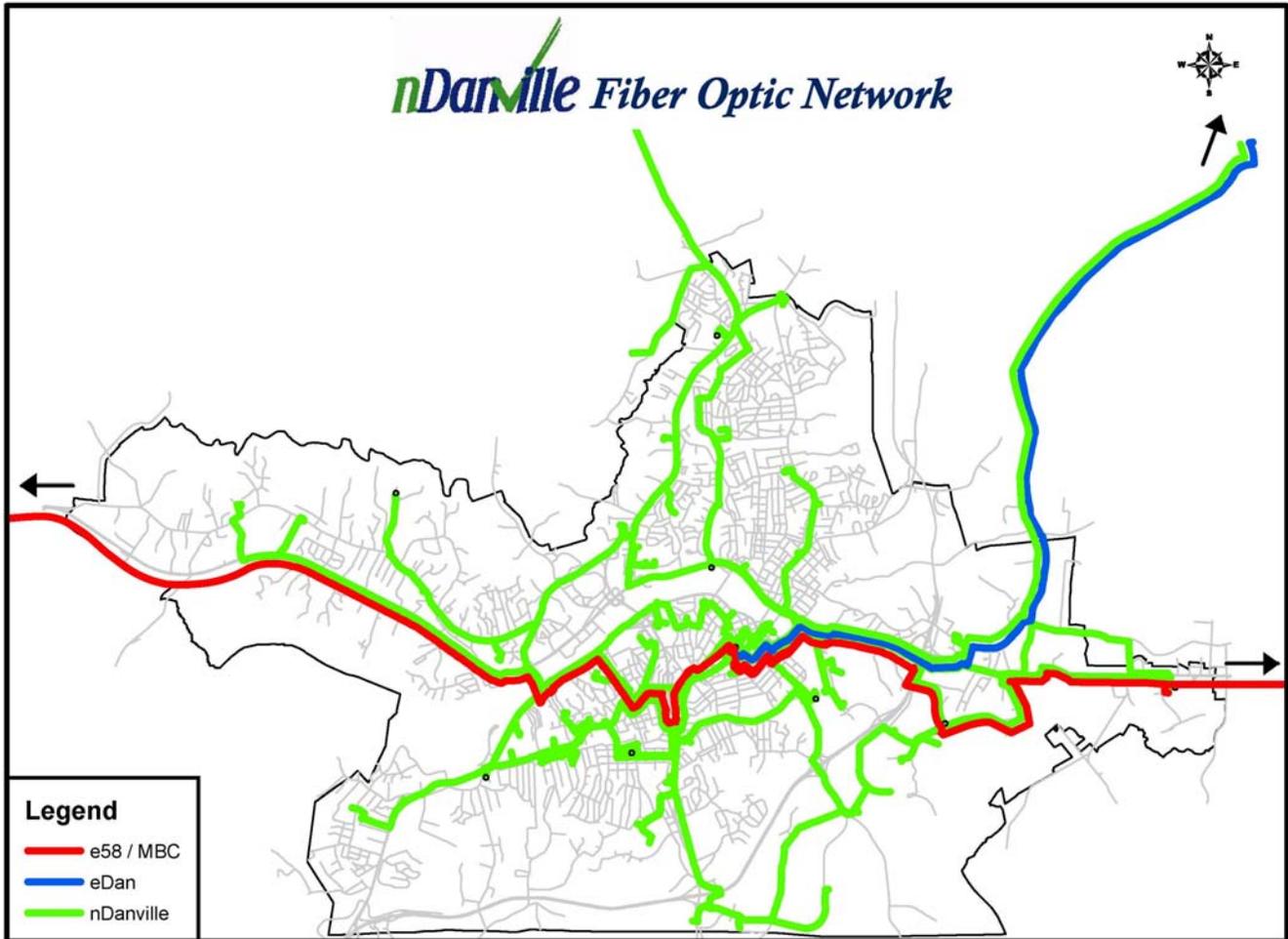
Who Will Use nDanville? During its initial phase, nDanville will serve only the municipal government and public school system. The City and Schools will use nDanville to improve multi-media communications and data transmission, support shared use of computer applications and data files, enable distance conferencing and learning, expand internet access, monitor and control equipment, and improve the reliability of utility and traffic control systems. nDanville will allow increased service efficiency and effectiveness to the benefit of citizens and utility customers and expand educational opportunities for Danville’s students. Additionally, a limited number of pilot

projects will be undertaken during nDanville’s initial deployment to demonstrate the potential application of nDanville’s technical capabilities for broader community and commercial use.

What About Commercial Use? The City is undertaking a step-by-step process wherein each Council-approved nDanville element is designed to improve municipal and school operations, but also open opportunities for economic development. Accordingly, nDanville has been designed to serve not only local government needs, but function as a platform from which network access and services could be extended to businesses, institutions, and households.

Minimally, nDanville’s point-to-point network and internet access capabilities could be made available to private sector telecommunications businesses at charges sufficient to cover costs and provide a reasonable return on investment. Several firms now doing business in Danville may wish to access nDanville, including Verizon and Adelphia, local internet services providers (ISPs) such as Gamewood, GCR Online, eDanville Online, D&K Custom Electronics, and national and regional ISPs like America Online, Earthlink, Mindspring, and nTelos. Access to nDanville could attract other telecommunications businesses to Danville.

The City itself could additionally provide telecommunications services over nDanville. These services are being provided in hundreds of other “public power communities” across the nation. The City has its Virginia Competitive Local Exchange Carrier telephone certification and is authorized to provide a complete range of broadband services. State law requires a confirming public referendum before an eligible local government may provide for-pay television services.



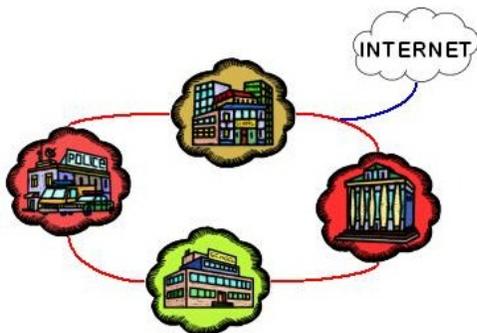
What is broadband? In a broadband network, computer data, music, and video are all converted to “digital bits” and transported in packets over copper wires, radio spectra, coaxial cables, and/or optical fibers. Sophisticated electronics separate and track billions of data packets flowing over common paths. The federal government currently defines “broadband” as a system that supports transmission speeds of 200 kilobits per second (Kbps) or faster. By comparison, a standard dial-up computer modem functions at 20 - 64 Kbps. Wireless computer modems use radio waves to send information at 500 Kbps and cable TV modems transmit at 500 Kbps to 5 million bits per second (Mbps). True high definition TV requires digital transport speeds of 20 Mbps. nDanville transmission rates will be as high as 1,000 Mbps (a billion bits per second), known as a gigabit per second (Gbps). The larger the number of packets to be transported, the more important transmission speed becomes. Users with many computers accessing a network at the same time, or who transport large documents, video files, or graphics, find high-speed broadband connections essential to their operations.

Why is broadband important? Availability of broadband service is important to businesses, schools, institutions, and individuals. These days, it is just as essential to some businesses as are other, more traditional water, sewer, gas, and electric utilities. This is especially so for high-tech and knowledge-based industries. It is also the case for conventional manufacturing industries that use broadband to coordinate management and share business functions across dispersed facilities. Virginia Tech’s “eCorridors Report” argues that access to broadband is essential for Southside Virginia if it hopes to revitalize its economy. Danville cannot expect to attract or retain industries it needs for economic development unless broadband services are readily available.

Broadband infrastructure and services characterized as follows will be required in Danville if the City expects to be competitive in industrial recruitment and business expansion.

- Affordably priced business internet service packages extending from 500 Kbps to over 500 Mbps of dedicated bandwidth;
- Network fiber leasing options ranging from unserviced “dark fibers” to fully serviced “lighted fibers;”
- Direct and redundant access to high-tier national internet backbones;
- High quality, high reliability connectivity; and
- Adequate support services and business packages priced and ready for delivery on demand.

Current Broadband Availability: Perhaps more than any other state in the Union, Virginia suffers from a “digital divide” separating urban and rural communities in availability of broadband infrastructure and services. *Site Selection* magazine refers to Virginia as the “Information Technology State” and “Silicon Dominion” due to its attraction of high-tech companies, universities, and information technology infrastructure. Virginia is rated among the top ten states in terms of broadband deployment. By contrast, Southside Virginia is among the most underserved regions of America when it comes to broadband infrastructure and services.



nDanville provides point-to-point and internet connectivity.

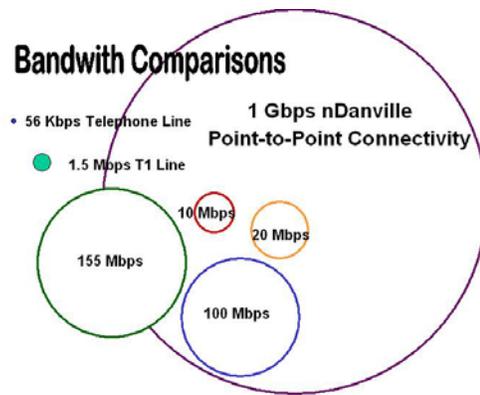
Standard business connections in areas like Northern Virginia are DSL (digital subscriber line) service, 1.5 Mbps (T-1 or DS-1 lines), 45 Mbps (T-3 or DS-3 lines), and higher-speed offerings. A wide variety of service options are available. Unfortunately, Danville’s residents and businesses have few internet options universally available in all areas. Verizon does not offer widespread DSL service in Danville. Gamewood has recently announced DSL service and is now extending wireless internet service in some areas that accommodates speeds of approximately 500 Kbps. Adelphia offers cable modem broadband

service, but not all areas are served and speeds vary from 500 Kbps to 3 Mbps. Verizon, Adelphia Business Systems, and nTelos provide customized business internet services, but not with offerings priced and ready to install on demand.

Just as important as internet connectivity per se, are the issues of traffic congestion. Internet speeds degrade when increasing numbers of users share lines and/or messages move across one network to another. Local internet service providers tend to offer shared rather than dedicated bandwidth. They do not provide direct connections to high-tier networks owned by AT&T, MCI, Adelphia, and Williams, even though these networks actually run through or near Danville on their way to Northern Virginia. Affordable access to these telecommunications resources is not readily available.

This is an all too familiar pattern in America’s rural or isolated metropolitan areas. Historically, new technologies initially enter only the largest urban markets. This occurred with the advent of the telegraph, electricity, telephone, and television and the same pattern appears true of broadband technologies. Infrastructure investments per potential customer in high-density areas like

Northern Virginia are much lower than in rural or remote areas such as Southside Virginia. Vendors are reluctant to enter low profit tertiary markets like Danville. The recession and rash of bankruptcies in the telecommunications industry are aggravating the problem in the case of broadband deployment. The Future of the Piedmont Foundation's report, "Learning. Working. Winning. Bringing the New Economy to the Dan River Region," called upon the community to move ahead and construct the kind of broadband communication network needed for economic development.



What Role Should the City Play? Use of nDanville could be limited to satisfying the needs of the municipal government and public schools, or it could be used to leverage significant expansion of broadband services to support transformation of the community's economic base. Central to reaching a decision on use of nDanville is determining to what degree the municipal government should influence, or even enter, the telecommunications marketplace. Is the following set of principle statements appropriate? If not, how should the City of Danville define its role?

- Danville's businesses, institutions, and households should have broadband services on par with those available elsewhere in Virginia in order to ensure equal access to entertainment, cultural, health, and especially to education and economic opportunities.
- The private sector should take the lead in deployment and operation of broadband networks and services in Danville. The City should facilitate and support this through policies and regulations that encourage private sector investment, competition, and innovation.
- Where the private sector is unable or unwilling to adequately serve the community in a manner comparable to other areas of Virginia, the City of Danville should unhesitatingly assume the lead role in broadband network services, as it has historically done in providing electric power and natural gas services.

After carefully examining unmet community needs and considering public input, the Danville City Council will consider opening nDanville for broader use. The Danville Utility Commission, one of Danville's citizen advisory boards, will oversee informing and involving the public on these matters and will recommend a course of action for nDanville. In preparing its recommendations, the Utility Commission will be assisted by municipal staff and a team of experienced consultants. The group will complete the process this fall. Public input on this subject is welcome. Contact:

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