

Vermont Telecommunications Plan

March 2010

Public Review Draft

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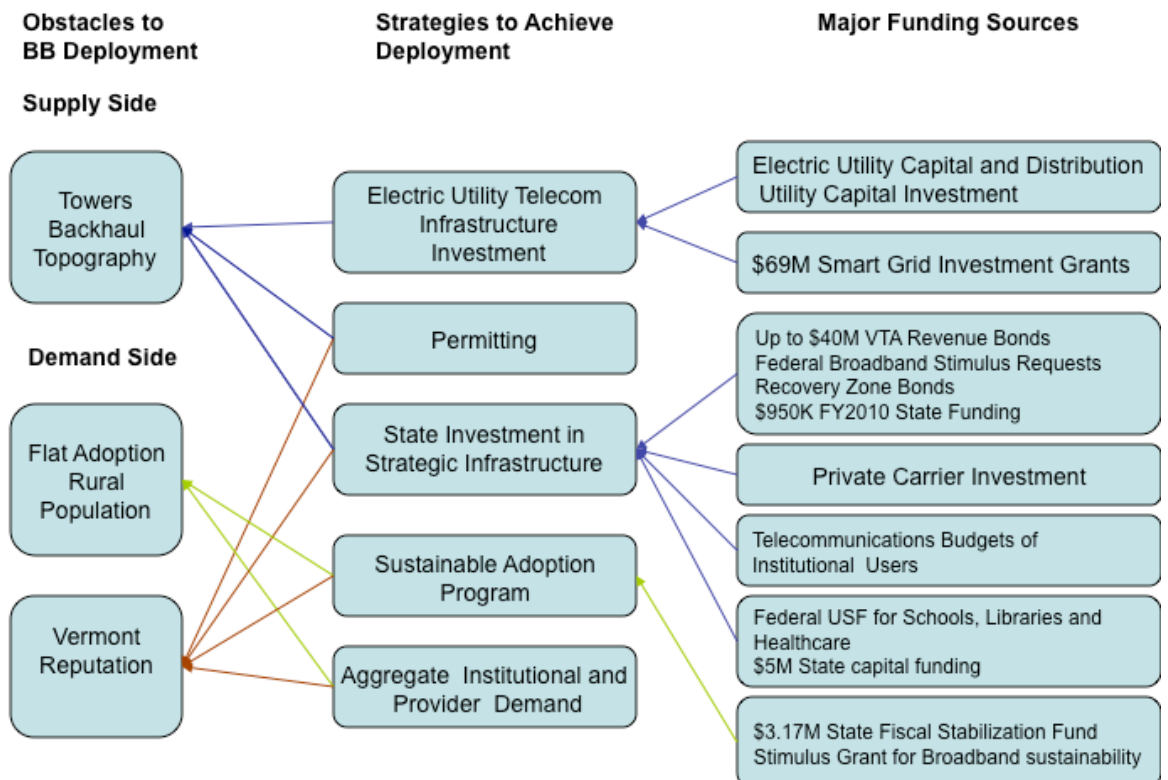
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EXECUTIVE SUMMARY

Vermont can and should pursue a path to achieve the following outcomes by year end 2012:

1. Universal availability of mass-market broadband
2. Universal availability of mobile service along roadways
3. Universal first responder communications
4. Fiber broadband connectivity to all anchor institutions and large businesses
5. Ubiquitous adoption and use of broadband at home and work
6. Speeds and pricing for residential broadband on par with national urban areas
7. All customer locations support smart electric meters

However, there are overarching economic challenges to the business case for sustainable broadband infrastructure in Vermont. On the demand side, sparse population and slow adoption in newly served areas provide lower incentive for private investment. On the supply side, Vermont's topography and the high costs of backhaul and tower construction are impediments to service deployment. Vermont has a business-unfriendly reputation and is known as a place where it is difficult to get development permits.



The following strategies describe how a statewide expansion of the fiber core will be harnessed to simultaneously meet and grow demand for broadband:

- Leverage electric utility telecommunications infrastructure planned to lower cost of backhaul and increase geographic availability of broadband.
- Aggregate institutional demand and organize connections to institutions, broadband providers and cell sites.
- Subsidize construction of key telecom infrastructure when necessary.
- Continue expeditious permitting policies to improve affordability of broadband deployment and bolster the business atmosphere in Vermont.
- Accelerate adoption through state funding for ISPs in unserved areas, funding for sustainable broadband adoption and changes in Vermont universal service policy.

These strategies will address important obstacles to the achievement of our objectives. Expanded and improved “middle-mile” fiber networks will deliver affordable high capacity backhaul that encourages statewide broadband deployment and use by institutional, mobile and home users. The plan maximizes resource-sharing between electric utility, public safety and broadband infrastructure which focus revenue streams and capital on a single set of physical resources. High bandwidth institutional use, in combination with statewide training and adoption incentives, builds broadband use throughout all sectors of Vermont and strengthens the long-term business case for providers throughout Vermont.

VERMONT TELECOMMUNICATIONS PLAN 2010

An increasingly mobile and communicative society and economy requires deployment of wired and wireless communications tools to meet its needs. Since the prior Vermont Telecommunications Plan, the state has seen tremendous development in communications infrastructure and services, but the need for this development is ongoing. Through continuing private and public investments Vermont can build broadband infrastructure that meets changing communications demands. This Plan describes strategies and funding sources to bring the benefits of advances in telecommunications technology and services to serve the needs of electric utilities, public safety, state government, businesses and the general public. This Plan emphasizes widely available infrastructure and initiatives that catalyze the widespread use of that infrastructure by all parts of society.

Vermont can and should pursue a path to achieve the following seven outcomes by year end 2012:

1. Universal availability of mass-market broadband
2. Universal availability of mobile service along roadways
3. Universal first responder communications
4. Fiber broadband connectivity to all anchor institutions and large businesses
5. Ubiquitous adoption and use of broadband at home and work
6. Speeds and pricing for residential broadband on par with national urban areas
7. All customer locations support smart electric meters

When these outcomes are achieved, Vermont will have integrated broadband infrastructure and usage deeply into everyday use. Institutional users, large businesses, and “last mile” providers of broadband to local homes and businesses will have available and routinely subscribe to “big pipe” services that provide ample bandwidth for present and future applications. Schools will have access to affordable gigabit connectivity and rural healthcare providers will be able to increase the diversity of services provided through ubiquitous mobile coverage and expanded broadband availability and adoption. Travel and tourism benefit from expanded mobile coverage for their customers and Vermonters will have more choices for communications providers at home. State government will transform the delivery of services to capitalize on the availability and statewide adoption of broadband in the home. Urgency created through the expansion of applications and statewide demand stimulation programs will foster ubiquitous use of broadband. Mitigation of costs to deploy service will promote the business model for mobile companies to expand their networks. Last but not least, service providers have the opportunity to participate and to prosper by expanding the availability and capability of their services.

OUTCOMES

UNIVERSAL AVAILABILITY OF MASS-MARKET BROADBAND

To date broadband service is widely available throughout Vermont, but in order to achieve all outcomes described in this document, broadband service must be available and affordable to all Vermont businesses and households. Currently 18% of Vermont businesses report that they do not have broadband and half of those businesses report that they don't have it because it is not available at their location. Among residential internet users who do not have broadband access at home, 53 percent report that they don't have broadband because it isn't available to them where they live¹. Mass market service means that broadband service offerings are priced for and available to homes and even the smallest business.

Universal broadband availability is a foundation for other outcomes we seek to achieve, notably universal use of broadband and the support of smart meters.

UNIVERSAL AVAILABILITY OF MOBILE SERVICE ALONG ROADWAYS

In addition to high speed, access to mobile services is another hallmark of a modern telecommunications network. Mobile networks allow users to carry their communication with them from their homes and offices when they travel around the state. As many voice users continue to abandon landlines, we anticipate that broadband users will migrate between their mobile and land-based broadband services. In some locations mobile broadband is and will be the primary service for some individuals. In order for users to experience mobile service as universally-available, there must be continuous coverage along those routes that connect Vermont communities to each other and to neighboring states and provinces. By the end of 2012, mobile service must be available along all key transportation links and service from these mobile networks must reach into over 80% of homes to achieve this outcome. Development of the tower and fiber optic infrastructure that carries mobile traffic back to mobile switching centers will often provide opportunities to develop the infrastructure that supports the state's other goals at the same time. Broadband availability, first responder communications, and smart grid technologies derive benefits from the availability of mobile service and its infrastructure.

UNIVERSAL COMMUNICATIONS FOR FIRST RESPONDERS

Local first responders working with multiple local and state safety agencies at an emergency will communicate on a unified communications platform. While local departments continue use of existing networks, access to a state level multi-unit communications network improves responders' ability to coordinate information between practitioners. The Vermont Communications Board (VCOMM) will use existing communications sites developed and used by municipal Public Safety entities, electrical utility companies, and the State of Vermont for the hosting of Life Line equipment. Additionally, VCOMM will develop four new towers that will augment existing infrastructure. Vermont

¹ Vermont Department of Public Service 2009 Telecommunications Survey Report

Lifeline System is capable of meeting the two-way voice interoperability needs of all first responders in addition to offering co-location opportunities for ISPs and mobile service providers. Availability of this additional infrastructure reduces the capital costs for these providers and improves the business case for expanding broadband and mobile service in Vermont. Revenue streams derived from leasing space on the four new structures can help support the maintenance of the structures.

FIBER BROADBAND CONNECTIVITY TO ANCHOR INSTITUTIONS AND LARGE BUSINESSES

Capacity on expanded fiber optic networks has the ability to connect institutional entities and other types of users in many areas of the state, especially in combination with existing fiber network infrastructure and/or new construction.

In the past, overarching economic challenges to the business case for sustainable broadband infrastructure in Vermont left many Vermont organizations with little or no choice of providers for enterprise level broadband and pricing was prohibitive. In fact, pricing models historically encouraged network managers to ‘slim down’ applications and network use in order to afford minimal bandwidth from providers that operated within a model of scarcity. However, in the near future, where large-capacity fiber connections are available and priced so as not to discourage additional use of that abundant capacity, there will be a qualitative difference in the kinds of applications developed. When users operate under an assumption of ubiquitous and unconstrained availability, this situation will lead to the implementation of new tools for home and work. Users will pay primarily for the availability of a high-capacity connection, but will have low incremental pricing barriers to extensive use of these connections once they are available. By the end of 2012, an environment where similar types of services and pricing conditions are essentially universally available throughout the state will encourage all members of various classes of users (such as education, or libraries, or health care institutions) to subscribe to a similar high level of service, promoting the development of networks that connect different classes of users.

Last but not least, service providers with legacy networks who connect with the new backbone and are willing to support this “abundance” will prosper. The value added to the network through increased content and participation facilitates new systemic efficiencies and may even promote greater spending on bandwidth at a lower per unit cost.

The availability of these types of fiber optic connection and “abundant” bandwidth over them will also support achievement of other outcomes in this plan. Mobile service along Vermont roads which requires transport service between radio locations that are remote and often served by only one or two T-1’s will also benefit from affordable high capacity fiber connectivity that enables higher data delivery speeds and seamless service. Similarly, local networks that supply broadband services to homes and small businesses rely on these high-capacity fiber networks to transport traffic from the local community to the wider world. On the demand side, sustainable broadband adoption programs and most importantly, aggregation among classes of anchor institutions that include large business, cell carriers, education, healthcare, government and libraries will support and be supported by the achievement of this outcome.

UBIQUITOUS ADOPTION AND USE OF BROADBAND AT HOME AND WORK

Each time a new user is added to a communication network, all the existing users benefit by having one more possible connection. Networks are especially valuable when they are near ubiquitous because they can be counted on for reaching everyone. That's why the US subsidizes universal telephone service and why Federal Express goes even to the backroads of the smallest towns. There is especial value in universal broadband action for the State of Vermont. Once high speed Internet access is as widespread as access to phones, the State can completely replace outmoded paper-based and even phone-based systems for communication with taxpayers, applicants, and clients. Near complete broadband adoption is necessary for the State to achieve its ambitious goals for e-health, e-education, the smart electric network, and e-government.

Whether via personal computer, netbook, smart phone or smart electric meter, all homes will be broadband users by year end 2012. Although not all will necessarily connect at targeted speeds, Vermont households will incorporate some level of broadband. All major Vermont institutions, including public schools, state government and health care provider networks will have integrated the use of broadband into the everyday delivery of services to the public that they serve by year-end 2012. Additionally, state and local program planning and budgeting offices incorporate assumptions around universal availability and widespread adoption of broadband when it can help them improve effectiveness and efficiency of programs and reduce the costs of service delivery. The development of relevant content from institutional, community and household users further creates urgency among consumers to adopt broadband as a tool essential to their lifestyle.

Increases in home, business, and institutional broadband use and ubiquitous adoption improve the business case for availability of affordable service by lowering the per user cost of service.

BROADBAND SPEEDS AND PRICING ON PAR WITH NATIONAL URBAN AREAS

Minimum Technical Objectives

Moore's Law and the FCC's Definitions

Moore's Law, first described in 1965, states that computer processor power grows at about 60% annually and a 1984 study by Nielsen suggests that a high-end user's connection speed grows by 50% per year, which history has proven accurate. Both predict the acceleration of Internet networking Communications Technology processing and network broadband consumption over the past 30 years.

In 1996 the FCC defined broadband speed as 200 mbps and above. In 2008 the FCC reclassified broadband as network bandwidth that supports a minimum of 768 Kbps. Services operating at speeds between 200 and 768 Kbps formerly considered "broadband" are now known as first generation data networks. The FCC has established tiers of service to facilitate the accurate collection of data from service providers. Those tiers are described below:

The commission required that filers determine the percentage of their broadband connections that are faster than 200 kbps in both directions and to categorize those connections into five "speed tiers" based on the information transfer rate in the connection's faster direction:

- (1) greater than 200 kbps but less than 2.5 megabits per second (mbps);
- (2) greater than or equal to 2.5 mbps but less than 10 mbps;
- (3) greater than or equal to 10 mbps but less than 25 mbps;
- (4) greater than or equal to 25 mbps but less than 100 mbps;
- (5) greater than or equal to 100 mbps.

As a result of this more refined data collection, the Commission is now able to examine the deployment of broadband capable of providing service in excess of 200 kbps on the basis of speed tiers in this and subsequent reports.

Network modernization and investment expectations are an important element of this Telecommunications Plan. Currently, the state should seek to support new deployments of broadband services that deliver or exceed 3 mbps download speed and 2 mbps upload to the customer premise and be designed to reasonably accommodate upgrades that meet future standards.² By year end 2012 new services should be capable of 6 mbps download and 4 mbps upload. The state should seek to support availability of these services at rates that are closely comparable with those paid by consumers in major metropolitan areas, not at premium prices. The state should expect the need for capacity to at least double every two years. By the end of this plan period, the state should be seeking to support new deployments of broadband service where the capacity exceeds 50 mbps and is symmetrical. Communications technologies with inherently high latency³ characteristics are, for the purposes of this plan, not considered broadband. Latency affects delivery of real-time synchronous communications. Internet connectivity delivered via geosynchronous satellite connections and caching technologies do not offer the same services as true broadband services. High latency disrupts internet telephony applications as well as the use of virtual private networks and highly interactive applications.

Download Demand

A variety of factors figure into the determination of the minimum technical service objectives for broadband in Vermont. On the downstream side, the dramatic increase in bandwidth demand in the US has been driven by online video demand. As the selection of new online media grows and the price of portable memory storage drops, consumers download increasing quantities of entertainment onto iPods, reading devices, thumb drives and cell phones for consumption at their leisure. As downloading entertainment in the time it takes to make a round trip to the local video store becomes a consumer's choice in much of the country, it should also be a choice for all Vermonters.

² These standards are intended to be the minimum technical objectives required by 30 V.S.A § 8077

³ Latency is the technical term for the delays in computer systems caused by both distance and processing. Distance creates latency because of simple physics. Messages travel at the speed of light and over long distances the delays are measurable. <http://www.exchange-handbook.co.uk/index>

Upload Demand

While the variety and quantity of online entertainment media continues to grow, policy makers must keep in mind that bandwidth consumption is a two-way street on the Internet. If the average online video watched is only 2.7 minutes, it is highly likely that many of the videos are user-generated and posted locally, which requires increasing availability of upload capacity. In order for rural Vermonters to participate in the Internet, they must have access to appropriately balanced broadband service on par with their suburban counterparts.

As increasing types of devices connect and users find new means of connecting to one another, demand for upload speed increases. On the household consumer level, Flickr, Skype and Google's multitude of applications, are examples of applications where users' content determines the value of the application. Increasingly, e-government, distance learning and healthcare providers offer services that require high levels of interactivity between end users and application distributors. Finally, access to adequate upstream capacity is essential because locally contributed content generates more of the elements that give the internet the custom fit that addresses Vermonters' family, community and work needs. In order to facilitate growth of Vermont's corner of the internet, Vermont has a definition of broadband that includes measures of upload capacity.

The Role of Technical Objectives

Opportunities exist to promote upgrades consistent with these objectives across all broadband provider platforms. In telecommunications regulation in Vermont, network modernization should continue to be a central goal of any alternative regulation plan. Cable companies applying for and renewing franchises should be required to upgrade networks capable of offering services that meet Vermont's evolving standard. Additionally, wireless deployments for mobile and fixed services can take advantage of abundant affordable backhaul and are more easily and affordably upgradeable than their wired counterparts.

Rapidly evolving compression technologies, online application design and use, infrastructure availability and pricing will all affect bandwidth consumption in the future. For this reason, the standard is reviewed no less than every three years.

Broadband Speeds and Pricing

On a national level, broadband speeds and pricing are the source of much confusion between consumers and telecom advocates. On the one hand, measuring connection speed is fraught with variables that are difficult for the end-user to identify such as the speed at which a wireless device connects to an access point, versus the speed at which data travels from one point on the internet to the next. On the other hand, pricing for various types of service may include equipment costs or the purchase of additional services. Price should also be described as relevant to the quality of service, i.e., speed, but is seldom described this way in national surveys. In Vermont, the average monthly price for broadband was \$39.00 in 2009. However this figure does not include additional equipment and service requirement costs, nor does it include any description of the service speed available at that price.

A month of Internet Video Use in 2008*

Notable findings from May 2008 include:

- 74 percent of the total U.S. Internet audience viewed online video.
- The average online video viewer watched 228 minutes of video.
- 82.2 million viewers watched 4.1 billion videos on YouTube.com (50.4 videos per viewer).
- 54.8 million viewers watched 703 million videos on MySpace.com (12.8 videos per viewer).
- 6.8 million viewers watched 88 million videos on Hulu.com (13.0 videos per viewer).
- The duration of the average online video was 2.7 minutes.

*ComScore Press release July 2008; <http://www.comscore.com/release.asp?press=2324>

ALL CUSTOMER LOCATIONS SUPPORT SMART ELECTRIC METERS

By the end of 2012, most Vermont utility customers will be connected to their utility through a “smart meter” that will help customers more efficiently control their electric use. Ubiquitous broadband availability will help utilities and their customers communicate about electric use in real time. Furthermore, investments in smart grid technology mean every household must have access to an infrastructure that provides always-on data service to support a smart meter – whether the property owner purchases broadband or not. This fact presents a tremendous opportunity for utility and telecommunications investments to be mutually reinforcing if they are coordinated over the next three years.

Smart grid is where electricity meets telecommunications. The “smart grid” is a term for a collection of technologies that promote greater reliability and efficiency of electric and other energy use by improving communication between electric utilities and the elements of the electric grid, including the customer and the devices that consume electricity. Consumers receive signals in real time related to how electricity prices dynamically fluctuate in wholesale electricity markets as electric load and generation supplies change, and they can automate the response of their electric devices in response to those signals. Electric utilities receive updates from smart devices deep in the grid that help them see, respond to, and even prevent outages and other reliability problems quickly, or even automatically. Furthermore, the improved ability of consumers to see and respond to low-cost off-peak power (and avoid the costly consumption of peak-use power) means that electric power powered by renewable and other non carbon-emitting sources can efficiently displace fossil fuel use in heating and transportation.

STRATEGIES

In support of the seven outcomes, state agencies and partners in the private sector, non-profits, and local municipalities can employ five major strategies. In many cases work has already begun. Funding sources and strategies in most cases provide benefits toward the achievement of multiple outcomes.

LEVERAGE ELECTRIC UTILITY TELECOMMUNICATIONS INFRASTRUCTURE TO LOWER COST OF BACKHAUL AND INCREASE GEOGRAPHIC AVAILABILITY OF BROADBAND

Through 2012, Vermont electric utilities will make substantial capital investments in smart grid infrastructure that leverage and are leveraged by investments in broadband infrastructure, supported by a \$69 million Smart Grid Investment Grant by the U.S. Department of Energy. Statewide, electric utilities are building communications infrastructure to extend smart grid capabilities to consumers. Leveraging these communications investments in coordination with federal stimulus dollars supports multiple outcomes. The electric utilities' fiber network will be as extensive as the state's transmission and the sub-transmission network which it serves, which runs through most of Vermont's cities and towns, greatly expanding geographic reach of current fiber networks and enabling availability of mass market broadband and universal mobile service. The backbone fiber addresses two additional outcomes of this Plan: 1) increasing the supply of high capacity service lowers the cost of backhaul for mobile service and ISPs and 2) improves network performance or speed by reducing network bottleneck affects on lower capacity networks.

By partnering with broadband service providers to deliver communications capability to customer meters, electric utilities can seek more efficient use of their funds, and broadband service providers can gain a key channel for enabling, marketing, and encouraging use of their product. Investments in fiber optics to transmission and subtransmission facilities and wireless communications systems to customer meters are an opportunity for investments in communications infrastructure that can and should provide a double benefit whenever it can efficiently. There will be great temptation in the push to make investment in smart grid to look narrowly at the opportunities and challenges in it for the electric grid. An even greater opportunity is possible if smart grid and broadband investment and adoption are seen as complementary issues.

AGGREGATE INSTITUTIONAL DEMAND AND ORGANIZE CONNECTIONS TO INSTITUTIONS, BROADBAND PROVIDERS AND CELL SITES

Vermont's institutional users—schools, colleges, health care facilities, government offices and facilities, and libraries—can be both important beneficiaries of improvements to high-capacity fiber optic transport networks and anchors for efforts to improve these fiber optic networks, which transport local broadband and cellular traffic around the state and to the wider world. Aggregated institutional demand enables anchor community institutions to improve

communications between partners, creates value for providers and promotes business for ISPs. In the first phase of an aggregation initiative, the VTA worked with organizations like the Departments of Education, Libraries, Public Safety, and Information and Innovation, Vermont State Colleges, the University of Vermont, Vermont Law School, and the New England Telehealth Consortium to identify their network requirements. The second phase of this aggregation effort involves the identification and organization of network partners through an RFP process to deliver gigabit service over fiber optic backbone networks to anchor institutions, broadband providers and cell towers. This process helps to identify how the needs of these users for abundant, low-cost bandwidth are best served. The needs of each class of institutional user will be met in at least one of three ways: 1) By connecting to existing available infrastructure 2) by extending fiber access from one or more of the existing telecommunications company or electric utility fiber optic networks 3) by developing new fiber network infrastructure that can be interconnected with existing networks. Coordinated aggregation

initiatives must focus on both the availability of gigabit fiber optic connections and on pricing that will encourage the type of abundant use described elsewhere in this plan.

This aggregated demand effort is a proactive approach to meet the state's communications needs. This effort should seek to have all locations connected with gigabit fiber access without significant pricing constraints on its use by year-end 2012. Some locations will be connected as early as July of 2010.

Each class of users will benefit from an abundance of available bandwidth through expansion of shared network applications and increased connectivity via new and existing backbone facilities. For example, schools within a supervisory union share online resources for teaching as well as administrative applications and tools for meeting federal funding requirements. In healthcare, administrative processes and patient data are shared between

regional health organizations, community hospitals, and private practices. State government capitalizes on distributed e-government service models and shared access to the statewide network.

An aggregated customer base supports other outcomes of this plan by adding value for internet providers and supporting their efforts to meet customers' needs and expectations. Aggregation supports universal broadband availability because anchor tenants will share the cost to bring fiber further out into rural communities and homes and businesses along the way will benefit. On the mobile side, reducing the cost of abundant fiber backhaul and providing access to more locations in rural communities where anchor institutions take service translates into broader mobile coverage and improved service.

Adapting Institutional Network Management

IT managers throughout Vermont have managed networks, hardware and users since the 1980's, and all the while they have worked within a model of scarcity of affordable and accessible broadband. However, the power of the combined backbone networks and advocacy policies described in this document change that model and require a commensurate change in managerial mindset. Today, IT managers have to create new working environments and propagate them with an array of digital devices that enable broadband use throughout a geographically dispersed workforce and service constituency. The push to explore and expand connectivity through additional users and devices is in and of itself the key to improving the value of the network and the services on it. Organizational leaders will structure business plans based on a 24x7 inclusive workforce, global product demand and affordable work environments that accommodate family needs and create economic benefits. Additionally, leadership must reinforce through partnership and collaboration the notion that affordable broadband tools offer cost efficiency and social and global advantages over traditional means of transacting business.

SUBSIDIZE CONSTRUCTION OF KEY TELECOMMUNICATIONS INFRASTRUCTURE WHEN NECESSARY

Where the private sector sees insufficient incentive to deploy expensive infrastructure with very long-term return-on-investment, there is a role for public sector financial support to ensure that all of Vermont's communities are connected to each other and to the wider world. In order to ensure that the state has the infrastructure that will permit the outcomes sought in this plan, the State should take advantage of opportunities to make capital investments in key infrastructure. In Fiscal Year 2010 the State provided funding for the VTA in order to target three primary areas of broadband infrastructure: fiber optic transport, tower construction and last mile broadband infrastructure. This included \$500,000 in capital and general fund appropriations for fiber optic transport network development across Vermont's six northern counties. \$250,000 in capital funding supports cell tower infrastructure and \$200,000 supports deployment of last mile broadband services to unserved towns.

Additionally, the VTA has available \$40M in revenue bonding authority, which can be used to finance construction of towers and fiber optic transport facilities. The VTA's bonding resources have been enhanced with the ability to use up to \$20M in Recovery Zone bonding authority, an ARRA-created program that can reduce the effective interest rate on bonds used for various projects, including the development of telecommunications. For FY 2011 the Administration has requested the legislature approve \$5 million in additional capital investment to be divided between tower infrastructure (\$3 million) and fiber transport (\$2 million). VCOMM received funding from the Department of Homeland Security and other federal sources which supports construction of towers that will provide co-location for cellular companies, wireless internet service providers (WISPs) and the Public Safety communications network.

In 2009 five Vermont ISPs submitted applications for federal stimulus funding to the U.S. Departments of Agriculture and Commerce in support of projects expanding mass-market broadband services. If all five applications had been granted, combined with obligations to build out by Comcast and FairPoint, all but a handful of Vermont communities would be at or very near 100% broadband availability. However, it appears that most, if not all, of these applications were not granted in the first round. Last mile Round 2 ARRA applications to cover these communities will be submitted directly by providers. The major focus of the second round of the ARRA Broadband Technologies Opportunity Program (BTOP) funding program will be Comprehensive Community Infrastructure projects, which includes support for middle mile broadband infrastructure and connections to community anchor institutions. In this category of project, Vermont supports the development of a single unified Vermont application with a coordinated set of public and private partners, having the VTA as the lead applicant.

Subsidizing key infrastructure solves the problem that the private sector could not address in a timely fashion. Because the State has an inherent interest in serving the public good, it is taking this once-in-a-generation opportunity to aggregate the otherwise disparate interests of institutional broadband consumers, home users and service providers and to fund construction of certain pieces of the state's communications network.

Expansion of affordable service over fiber backbone networks in Vermont's most rural areas reduces network bottlenecks and provides access to low cost backhaul services, in turn improving the long-term business case for cell carriers and ISPs. The combined VCOMM, cell tower and fiber infrastructure projects create mutually beneficial revenue streams over shared facilities and are further supported through expedited permitting processes established in Act 79

CONTINUE EXPEDITIOUS PERMITTING POLICIES TO IMPROVE AFFORDABILITY AND BOLSTER THE BUSINESS ATMOSPHERE IN VERMONT

Federal Policy and Mobile Services

Advocacy at the FCC of federal roaming regulation supports the case for rural carriers in Vermont. In order for carriers to serve their customers in non-rural markets, they must have roaming agreements with major carriers on reasonable terms. Without such agreements, carriers that serve small and rural markets can only provide service in rural areas by also bearing the heavy capital cost of overbuilding already served markets, when existing infrastructure is available but inaccessible. Another area for advocacy includes spectrum policy that requires rapid build-out of licensed spectrum and the release of unlicensed spectrum, particularly the white spaces that were the domain of television broadcasters.

State regulations that encourage access to existing infrastructure and expedite the permitting process for network expansion create efficiencies and improve affordability that improve the business atmosphere in Vermont. In order to promote the deployment of necessary wireless infrastructure while encouraging development that minimizes impact on Vermont's landscape, the Legislature, through Act 79 and subsequent amendments established new permitting processes. The Public Service Board is now empowered to further the State's interest in ubiquitous mobile communications and broadband service. Section 248(n) of V.S.A. §30 gives the Board the authority to expedite the permitting process for wireless installation on electric transmission and generation structures. Additionally, Section 248a provides a means for PSB review of proposals for installation of wireless facilities on new and existing structures with defined deadlines for rendering a decision.

ACCELERATE ADOPTION THROUGH STATE FUNDING FOR ISPS IN UNSERVED AREAS, FUNDING FOR SUSTAINABLE BROADBAND ADOPTION AND CHANGES IN VERMONT UNIVERSAL SERVICE POLICY

The greatest impediment to deployment of statewide broadband and mobile service has been the lack of a compelling business model in the less densely-populated and less traveled parts of the state. Low broadband adoption rates stifle ISPs' plans for expansion and delay modernization of the economy at commercial, state, and community levels. Similar to the State's role in building infrastructure where the business case is challenging, the state must also develop its own approach to encouraging broadband adoption that improves the long-term plan for providers. One such approach is a three-pronged strategy that includes near-term incentives for new adopters, community-based demand stimulation, and changes in Vermont Universal Service.

Backroads Broadband

Affordable and accessible broadband offers the convenience of online services which support the long term business case for ISPs, but some would-be consumers simply don't know the value of broadband and therefore don't purchase it. One means of improving current adoption rates is to offer consumers an inducement to take service until its value becomes clear. When users have the connectivity to try out services like online banking, accessing medical information or even reading postings about community activities, they can begin to value the service. In combination with the sustainable adoption programs described below, Backroads Broadband can jumpstart adoption rates for the first year of service where broadband is new. The program, as proposed to the Legislature provides \$3.17M in funding from the State Fiscal Stabilization Fund in support of higher adoption rates. This program offers very attractive reasons for home users to adopt broadband service by subsidizing equipment or monthly charges. Providers who deploy service to 100% of an unserved area receive the benefits through customers who sign up for new service. Each newly subscribed household is eligible to receive \$20 per month toward the subscription fee for up to one year. Under the Backroads Broadband program, new users gain the experience that helps them realize the benefits of connectivity, providers open new territories with positive support for rapid adoption and the State improves the likelihood that more Vermonters will choose to access government services and information online.

Sustainable Adoption

For many, the internet seems irrelevant to their lives and the effort to become digitally literate unnecessary. Furthermore, providers need to know that their customers have a long-term interest in using the internet. The second prong must address long term growth of the customer base. The State should consider implementation of sustainable adoption programs such as those described in an application for ARRA funding made by the Vermont Council on Rural Development (VCRD), which targets broadband use and sustainable adoption at the community level. By reaching the foundations of Vermont communities—schools, businesses, municipal government, libraries, health and social services groups—successful adoption programs can drive the use of broadband in parts of the state that are just receiving services and effectively jumpstart adoption rates. If the program is funded, VCRD's proposed e-Vermont schools will engage faculty, administration and students to take advantage of 21st century teaching and learning methods online. Under this program, the Vermont Small Business Development Center and Vermont State Colleges will team up to develop course offerings in professional development and best online practices for joining the national economy. Late adopters access skills development courses at libraries, schools and employment training centers which support all community members' access to and use of online government services, health-care and community activities.

The adoption of new services will follow from the efforts of young people, business leaders and organizations who seed contributor-based platforms with local content and new users will find relevant information through applications like Front Porch Forum, Twitter, and YouTube. Strategic stakeholders such as

educators and e-government initiate their own efforts to drive innovation and efficiency which also increase demand. Finally the newly served communities will model use that will have viral effects in their neighboring towns driving the figures higher. As deployment of institutional service applications increases, usage increases and is an incentive for providers to expand and maintain universal broadband service to Vermonters.

Universal Service

The third prong addresses the long-term affordability of modern communications services for consumers and providers. Through expansion of the electronic delivery of government, education and private sector services, Vermonters will have reason to purchase and use broadband services at home. For those who use it, broadband internet access increasingly replaces the telephone. In order to make broadband and the services it enables as accessible as the telephone, it must be affordable to all. Discussions regarding the expansion of federal Universal Service funds to include broadband are under way and should also take place in Vermont at the State level. Including broadband service providers in the pool of eligible recipients promotes the long-term viability of last mile service providers as well as existing telco's that continue to modernize their networks and transition to IP based services. Distribution of funds through Vermont Universal Service for Lifeline in support of broadband should foster affordability of monthly service in low income households. Enabling qualified households to receive basic internet service at a nominal cost bridges the Digital Divide and pays dividends for all when it lowers the cost of doing business.

Transformation in the delivery of public services that truly unlocks the possibilities of universal broadband infrastructure will require changes in behavior by both the institutions that use communications technology in the service of their mission and broadband service providers. Institutional users will need to recognize and understand the possibilities of that shift. Exactly how they use broadband to change the way they do business is a subject for plans in education, state government, health care, and other areas of public service. Recent planning in these areas indicates some examples of the changes that will be needed.

Education

When schools employ virtual school and classroom models through the Vermont Distance Learning Initiative, administrators, educators and students strengthen and build value on the network at new levels. Increasing network use in this way improves the quality of education because it offers access to wider course selection and a more diverse student body. Schools or districts have the ability to choose the best programs to be offered regardless of the instructor's location. The E-rate consortium, established by Vermont's K-12 schools will support statewide applications for E-rate funding rather than more costly applications submitted by individual schools with limited administrative resources. Other initiatives that will take advantage of broadband include a possible statewide student information system (SIS) for all K12 schools and distance learning programs. Costs will be reduced through consolidated administrative services. Finally, expanded broadband adoption and use in schools promotes increases in home adoption and use.

e-government

A “MyVermont” homepage will change delivery of state services to electronic format. In this near-future vision, the MyVermont homepage is a customized website for each individual Vermonter. Access to the site allows users to view, subscribe to and modify the delivery of Vermont government services of interest. From tax payments to car registration, food stamps and social and public safety services, citizens will be able to review services delivered, deadlines for renewal, eligibility and obtain the status of requested services.

MyVermont will be available to consumers and state employees 24x7 to provide timely answers on the user’s schedule rather than during hours of service. Service delivery becomes flexible and cost effective once users have adopted home broadband services and use them. To support the transition to the e-government model, kiosk attendants, who are not affiliated with any agency are located in state offices and facilitate use of the application rather than the provision of a specific service. They require knowledge of the kiosk system rather than higher cost agency specific skills and qualifications. Statewide, the availability of abundant backhaul services to state offices facilitates affordability of MyVermont deployment as well as speedy access to services over bottleneck free networks.

Healthcare

The creation of menus of tools for specific audiences – such as seniors, the disabled and rural healthcare providers will ease the transition to digital record keeping and improve use of inter-provider networks. Collaboration between healthcare providers and communities of higher education supports adoption and meaningful use of Electronic Health Records (EHR) for consumers and organizations that require access to patient records.

Adopting e-government

The shift in service process and delivery creates urgency for household adoption that will also require support from sustainable adoption and training programs offered in communities. Vulnerable and late adopter populations benefit from Vermont based research funded through ARRA. Training programs for those populations will be based on the results of the statewide telecommunications survey included in this plan and a report on ten focus groups to be published in 2010.

CONCLUSION

Modern communications tools are the connective tissue that supports collaboration and cohesion among and between Vermont's business, healthcare, education, and government sectors. This plan supports the integration of multiple backbone networks into a unified statewide resource that enhances the power of the whole exponentially. Affordable ubiquitous access to all levels of communication enables Vermonters to create in-state quality jobs with low environmental impact. Networked employers and employees have access to workspaces that accommodate family needs and empower all to take advantage of online professional development tools and human services on a schedule that accommodates 21st century lifestyles. Digital tools connect businesses and individuals in remote areas to the jobs, services and products that strengthen the future of the state. When more Vermonters possess high level online skills and they adopt high speed services on any of a multitude of devices, they can participate in the knowledge economy of the 21st century.

Today, through initiatives undertaken by private utilities and through a shift in federal funding and green technology priorities, Vermont faces a rare convergence of opportunities to affect our outcomes over the next few years. Because state government and utilities were proactive in addressing radical changes in energy and communications needs long before announcements of ARRA funding, Vermont is well-positioned today to embark on collaborative projects in infrastructure development and service deployment that raise the bar for economic development, educational opportunities and government and healthcare service provision and delivery through digital inclusion.

The outcomes and strategies described in this plan provide the tools to support transformation of Vermont's economy through better communication. Vermont is small enough to undertake significant changes in how we go about the business of business and to see the benefits of those changes in a relatively short time. Vermont is at a pivotal moment both in its funding opportunities and in the development of sound partnerships that aim to modernize the state's economy while maintaining a reputation for high living standards and environmental appreciation. Vermont's telecommunications policy is to enable Vermonters to connect with one another, access necessary resources and constantly improve the value of communications networks by adding users. When Vermonters expect to have abundant broadband capacity, we will keep finding ways to use it that change quality of life standards by expanding personal, community and professional networks and how we use them.