



**INFRASTRUCTURE TASK FORCE
ON TELECOMMUNICATIONS**

WORKING PAPER

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I. A Vision for Vermont

■ ***What is the problem?*** There must be a vision in place that articulates the benefits of a coherent, strategic telecommunications policy or Vermont will be left behind. The developers of public policy must be guided by that vision. They must develop and enforce policies that lead us as a community to the goals and benefits articulated in the vision. Although telecommunications is frequently cast as a political issue, it is not. It is a socio-economic infrastructure issue. It is the fabric that underlays the various complex issues with which our political system wrestles. Creation of, and adherence to such a vision will enable Vermont to be competitive in the region, the country and, in the near future, the world.

By competitive, we should not understand this to mean in a business sense, although that is certainly one of the benefits of a telecommunications vision. A vision which leads to the development of a state of the art wideband public/private network will have a major impact on our educational system, health care delivery, cost and efficiency of government, access to government services and information by our citizenry, our cultural institutions, economic development, public safety, and consumer services such as phone, fax, data networks and eventually, on demand delivery of in home services such as entertainment, games, educational courses, telecommuting opportunities, and shopping services.

The vision is complex in several ways: (1) the mix of public and private accords necessary to encourage construction (or enhancement); (2) the migration from traditional regulated monopoly attitudes to competitive, free marketplace attitudes; (3) the need to protect the right to privacy of citizens and businesses served by the network; and (4) the need to allow equal access and opportunity to all people and businesses regardless of income or size.

What is the vision? The pace of significant innovation in communication technology now exceeds both the human generational life cycle (30 years) and even the political life cycle (4-8 years). An effort to regulate based on near past experience will always be playing catch up. The greater opportunity comes from understanding and planning for future applications in communications.

The vision is a Vermont that is a laboratory for experimentation in communications. Vermont has unique assets that support this vision. It is small and lends itself to piloting innovative programs. It still has accessible government. It has a less rigid regulatory process than many states. Scale is small enough such that success can easily be amplified and migrated into general use; and failures, which are inevitable, do not represent huge losses either in money or prestige.

A Vermont that gets its cake and eats it too. Vermont has a traditional reverence for its environment and life style. State of the art communications technology can allow Vermont to compete internationally in business, education, health care, and in government services and information. A public network, whether wired or wireless, is

not an intrusive element in the environment. It transports revenue and money at the speed of light to and from information resources and financial centers around the world. Businesses that process information often require less space, rarely have toxic effluent, frequently offer improved compensation and benefits, and are not constrained by their Vermont location except by limitations in communication (and sometimes transportation) technologies. They also lend themselves nicely to telecommuting applications which reduce automotive commutation.

In addition, a "state of the art" telecommunications link enhances the incubation of small businesses by allowing them access to broader markets and to more sophisticated business, data, and revenue transmission services. And finally, it helps level the playing field between small businesses and their larger competitors nationally.

A Vermont that meets the medical needs of its citizens with quality and cost efficiency through the use of a communications network to link major medical centers to small general practice clinics located in communities. These primary care facilities will have remote diagnostics, high definition medical imaging, and rapid transfer of digitized medical records to and from the specialized institutions without their immense overheads.

A Vermont that will offer its people of all ages educational opportunities regardless of location or community tax base by using a comprehensive statewide distance learning network to which everyone will have access, either in an educational institution or at home.

A Vermont that will have a state of the art public safety communications system linking public safety, judiciary, corrections, DMV, emergency services and appropriate state agencies to ensure a safe, responsive society.

A Vermont that will have a system of state government that functions as a service organization for its citizens, institutions, and businesses--responsive to the requests and concerns of its citizens--quick to process all forms of licensing requests, requests for information and agency services; cost effective in its administration of tax policy; and marketwise in its provision of travel and tourism information.

II. Action Steps

Vermont must design and pursue a coherent and consistent telecommunications policy adhered to by all responsible groups that clearly and succinctly articulates the social and economic goals it wishes to achieve. The Governor must understand and champion the policy. The legislature must imbed the goals in stable legislation. The Public Service Department must craft its regulatory policy to enable achievement of the goals and to foster a private sector investment challenge to build and enhance the network. The time and cost to receive regulatory approval for new service initiatives must be reduced. A bargain must be struck between competing providers who will build/enhance the network and the public and private sectors whose use of the network will help achieve the goals articulated by the legislative and the executive branches.

Specifically, the following actions should be pursued:

A. Adopt An Open Market Plan - The state should allow and encourage complete competition by all qualified entities in all forms of telecommunications. This would include long distance, cellular, local exchange, cable TV, video and other emerging services. This would allow all Vermonters choice. Where choice and competition exist, private investment increases, costs are reduced, and enhanced services flourish consistent with the marketplace opportunities.

B. Support The Universal Service Fund Concept - This program guarantees that in an open market environment we have equity which alleviates a further stratification of potential "haves" and "have nots" by providing a vehicle to pay for our highest priority social policy goals. These include TDD (for hearing disabled), E911 (for emergency services), Lifeline support, and service in high cost rural areas. This insures all Vermonters will have affordable access to the communications network. This initiative is funded by all telecommunications providers for the benefit of our citizens.

C. Recruit and Cultivate "Anchor Tenants" - The state should take an active role in supporting and attracting anchor tenants (intensive telecommunications users). The addition of these users in any area in Vermont, justifies infrastructure investment and benefits all users in that geographic area with low costs and enhanced services. The state can move up the timing of these investments by taking a pro-active role in this process.

1.) Support: State government could provide incentives for investment by telecom companies in the public network. The Vermont market can only support a limited number of high function networks. Subsequently, by building on the existing infrastructure in the following ways, the state can provide the greatest benefit:

- Purchase (rather than build) state/telecom services.
- Act as a broker for purchasing telecom services for public education as a volume aggregator. Let schools choose from a service basket contracted by the state.
- Continue to foster electronic information applications designed to enhance public access. This includes the state library application (VALS) and should be expanded to include other departments.

2.) Attract: Actively pursue attraction and retention of telecom intensive industries to our state. Use of public incentives such as tax considerations and private incentives available from the telecom providers such as price concessions and infrastructure investment should be used to achieve this objective.

D. Provide Applications Education: Encourage telecommunication providers to furnish applications education to users of services in our state. Technology and innovation have created many new service opportunities such as those listed in the applications section of this paper. This information needs to be effectively communicated to potential users throughout Vermont. State government's early commitment to and use of these

applications will enable the state to set an example and to be a showplace for valuable telecommunications capability.

III. Applications in Vermont

In considering the present and potential impact of telecommunications on Vermont, it is important to remember three points.

First, there is no single system or application. The "telecommunications infrastructure", as it has come to be called, is a web comprised of copper wires, fiber, satellite, and a wide variety of radio and microwave links. Those links are owned and managed by heavily regulated common carriers, cable companies, lightly regulated startups, various levels of government, and a variety of private enterprises. It is becoming increasingly easy to interconnect the links so that the end user is able to send and receive voice, text, data, graphics or video flexibly and reliably.

The flexibility and reliability of telecommunications is largely a function of computerization. It is computers which manage the links and the connections between the links, as well as the end user applications. Indeed, much of the power and scope of the telecommunications revolution is a product of communication between and among computer applications.

The second point is that the telecommunications infrastructure is content neutral. Anything that can be represented by voice, text, data, graphics or video can be moved. There is no end to the variety of traffic which can move on the infrastructure: it will range from the most personal and intimate of communications through entertainment to scientific, academic, commercial, and government uses.

The third point flows from the first two. As new ways to transmit, receive, and process information develop, and as the relentless increase in computer power combines with the relentless reduction in the cost of computing power, there will be more and more uses for the telecommunications infrastructure. It is impossible to predict what they all will be. It is only possible, rather, to predict that they will be limited only by imagination and the then prevailing capacities and costs of transmitting and processing information.

We present here seven areas in which telecommunications is currently, or will shortly, have a profound impact. It does not pretend to be exhaustive. It does, however, suggest how pervasive telecommunications has become in the lives of Vermonters. It also suggests, when read in the context of the three points above, that the telecommunications revolution has hardly begun.

1.) *Consumer/Personal Services*

a. POTS (Plain Old Telephone Service): Ubiquitous but unheralded, telephone service is the backbone of most consumer services. The telephone wire gives consumers access to a growing array of services, as well as voice communication to almost any point on the planet.

b. On-line services: Undergoing explosive growth, the on-line services provide consumers with a package of services including E-mail, news services, financial data and services, special interest forums, medical information, real-time "chat", political information, graphics, and Internet access.

c. Home banking and financial services: Also offered by the on-line services, home banking is being actively tested in several cities. A number of brokerages currently offer sophisticated analytical and trading packages.

d. Home shopping: Pioneered by several cable networks utilizing 800 numbers, home shopping will shortly become interactive through cable systems.

e. Entertainment: The engine driving the construction of the information superhighway into neighborhoods, the provision of entertainment products to the home is seen as a potentially enormous business.

2.) Business Services

a. Inbound/outbound telemarketing: Telemarketing permits very large retail operations to prosper in remote, lightly populated areas like Vermont.

b. High speed data transfer: The heart of any large, modern enterprise is the ability to process and transfer data quickly.

c. Electronic banking and fund transfers: When allied with other information processing technologies and techniques, electronic banking gives every business and region access to financial markets and institutions worldwide.

d. Credit card processing: Virtually every credit worthy person (and some only marginally so) has the ability to purchase on credit from even the smallest retail operation, to the great benefit of all.

e. Telecommuting: A growing phenomenon in Vermont as elsewhere, telecommuting permits people to perform jobs from their homes which may be very remote from their "offices". It is made possible by a number of communication and computer technologies.

f. Teleconferencing: Conducting meetings electronically saves money and time, and permits more flexible and efficient use of people and resources.

g. Client data links: These links tie vendors or suppliers together more tightly with customers and are at the heart of "just in time" manufacturing or restocking systems.

3.) *Medicine and Health Care*

- a. Remote diagnosis and consultation: Primary care providers and specialists can utilize the knowledge and resources of distant experts and institutions.
- b. Medical imaging transmission: An essential element of remote diagnosis and consultation, high quality X-ray, Cat scan, and MRI images can be transmitted to distant institutions and experts.
- c. Patient data transmission: The seamless transfer of patient records and data among health care providers will improve the quality of health care with far greater efficiency.
- d. Health care planning: The data collected in computerized patient records will provide the basis for more precise and effective planning, as well as outcome based care.
- e. On-line health care information: Patients and consumers of health care will have access to far more information about their conditions, the availability of care, and the performance of providers.
- f. Home health: The development and deployment of increasingly sophisticated monitoring devices make it possible to treat many illnesses and conditions at home that only a few years ago required hospitalization.

4.) *Public Safety*

- a. 911 infrastructure: Police, fire, and other emergency services will be far more effectively dispatched and coordinated with the installation of 911.
- b. Records access: the ability of police officers to access, almost instantly, state and national crime records will significantly increase the effectiveness of law enforcement.
- c. Monitoring of the elderly and infirmed: The spread of programs like Lifeline enable emergency services to react swiftly to problems experienced at home by people who, absent these programs, would have to be institutionalized.

5.) *Education*

- a. Distance learning: It is increasingly possible to conduct classes and courses entirely by television and computer, giving students of almost any age living even in the remotest areas access to advanced to specialized instruction.
- b. On-line library services: VALS (Vermont Automated Library Services) is an example of how computers and telecommunications can give any student or resident access to university, college, state, and local libraries across the state.

c. Database access: VALS, the Internet, Dialog, Nexis, and other databases and collections of databases give students, faculty, and curious Vermonters access to an extraordinary array of information.

6.) *Government Information & Services*

a. Government voice and data communication: The state government is a major user of communications services as it shuttles information from regional offices to Montpelier and among agencies.

b. Government services: Many of the functions and services which government performs with the public, including issuance of driving, fishing, and hunting licenses; travel and tourism information; commercial permits; and social and rehabilitative services lend themselves to telecommunication access.

c. Government data: Individuals and, particularly, businesses rely on government data, including vital records, census data, motor vehicle records, economic and tax data, and legal decisions, which can be made available to the public in digital form.

7.) *Non-profit & Public Service*

a. Public access TV: The number of public access TV channels is increasing, as is interest in them. They give the public access to government meetings and other events. As cable companies interconnect, a statewide legislative channel (VtSPAN) will be possible.

b. Civic networking: Groups and organizations across the political and social spectrum will be able to connect, organize, and interact.

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