

**DEL NORTE COUNTY  
TELETRANSPORTATION / TELECOMMUNICATIONS STRATEGIC PLAN**



Antenna at Requa

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June 17, 2007

# DEL NORTE COUNTY TELETRANSPORTATION / TELECOMMUNICATIONS STRATEGIC PLAN

## Table of Contents

<b>Executive Summary .....</b>	<b>1</b>
<b>Preface.....</b>	<b>4</b>
<b>The Importance of Teletransportation / Telecommunications.....</b>	<b>5</b>
Overview.....	5
Broadband Matters -- Here's Why! .....	6
Impact of workplace broadband.....	7
Impact of residential broadband.....	7
Implications for policy-makers .....	8
Implications of the new Digital Economy .....	8
Transitioning to the 21 <sup>st</sup> Century Economy -- <i>the Digital Economy</i> .....	10
<b>Assessments – <i>Where are we?</i>.....</b>	<b>11</b>
Del Norte County Profile .....	11
Location .....	11
Economy and Jobs .....	13
Telecommunications Survey.....	19
Telecommunication Readiness .....	33
Telecommunications Infrastructure .....	33
Global.....	34
National.....	35
California .....	36
Route Redundancy.....	43
Other projects of interest.....	44
Assessment Summary .....	45
<b>Del Norte Teletransportation / Telecommunications Strategic Plan .....</b>	<b>47</b>
Mission Statement.....	47
Vision Statement – 2010 and beyond .....	47
Goal 1 –Del Norte County's Telecommunication Infrastructure and Services Match 21 <sup>st</sup> Century Demands.....	48
Activity 1.1 Establish a Standing Information Technology Advisory Committee .....	48
Activity 1.2 Support and Facilitate Availability of Broadband .....	49
Activity 1.3 Support and Facilitate Availability of Quality Cellular Phone Service....	50
Activity 1.4 Support and Facilitate Regional Route Redundancy .....	51
Activity 1.5 Support the efforts of the California Broadband Task Force and work with Curry County .....	51
Goal 2 -- Del Norte County's Workforce Is 21st Century Ready.....	53
Activity 2.1 Ensure development of a 21 <sup>st</sup> Century Digital Economy Prepared Workforce .....	53
Activity 2.2 Promote and Support Small Business Growth.....	54
Activity 2.3 Develop Programs to Ensure Adequate Supply of Trades Workforce .....	54
Activity 2.4 Evaluate the Potential for Community Development Resource Centers..	55
Goal 3 -- Del Norte County Is A Full Participant in the 21 <sup>st</sup> Century Economy <i>and the World Knows It!</i> .....	56
Activity 3.1 Promote Del Norte County's Telecommunication Assets.....	56

Activity 3.2 Include 21 <sup>st</sup> Century Factors In Economic Development Policy.....	56
Activity 3.3 Continue the Regional Approach to Economic Development.....	57
Activity 3.4 Develop an “Independent Living” Pilot Project .....	57
Activity 3.5 Promote Increased Telework / Telecommuting Opportunities.....	58
Activity 3.6 Promote expanded use of telehealth/telemedicine technologies.....	58
Concluding Remarks.....	59
<b>Appendix 1 - Del Norte Teletransportation Strategic Plan Gantt Chart .....</b>	<b>60</b>
<b>Appendix 2 - “BEARFACTS” 1994 vs. 2004.....</b>	<b>63</b>
<b>Appendix 3 – Impacts of Broadband .....</b>	<b>65</b>
Jobs, jobs, jobs!.....	65
Our children, their futures.....	66
Healthcare .....	67
Access to government.....	68
Public safety.....	69
Not for profits .....	70
Recreation .....	70
Rural communities.....	70
<b>Endnotes.....</b>	<b>72</b>

*Table of Figures*

Figure 1 - Highway 199 near mouth of Jones Creek (1920’s).....	11
Figure 2 - Old Redwood Highway.....	11
Figure 3 - County owned McNamara Field Airport adjacent to Crescent City .....	12
Figure 4 - Commuting Patterns in Del Norte County - 2000 census information .....	12
Figure 5 - Employment as of February 2007 .....	13
Figure 6 - Personal income comparisons with other counties in the region .....	13
Figure 7 - Average Earnings per Job .....	14
Figure 8 - Del Norte County Income .....	14
Figure 9 - Fast Growing Occupations in North Coast Region by sector .....	15
Figure 10 – Top 50 Estimated Fastest Growing Occupations in North Coast Region, 2002 .....	16
Figure 11 – Top 50 Occupations With the Most Job Openings, 2002-2012, North Coast Region, .....	18
Figure 12 – Top 50 Fastest Growing Occupations, 2002-2012, North Coast Region .....	19
Figure 13 - Survey Response Rate.....	20
Figure 14 - Areas With Responses.....	20
Figure 15 - Home Based Businesses.....	21
Figure 16 - Sectors.....	22
Figure 17 - Telecommunications Connections .....	23
Figure 18 - Plain Old Telephone (POT) Usage .....	23
Figure 19 - Service Provider Ratings.....	24
Figure 20 - PC Ownership and Usage.....	24
Figure 21 - Business Internet/Web Usage .....	25
Figure 22 - Interest in Training.....	26
Figure 23 - Access .....	27
Figure 24 - Speed.....	27
Figure 25 - Price.....	28
Figure 26 - Future .....	29

Figure 27 - Videoconferencing .....	29
Figure 28 - Global Communications Submarine Cable Map.....	34
Figure 29 - “US-Centric” Broadband Traffic Rates .....	35
Figure 30 - Map of U.S. City Internet Connectivity .....	35
Figure 31 - K-12 Connections to the California Research and Education Network (CalREN) ...	37
Figure 32 - One view of fiber in the region .....	38
Figure 33 - Antennas in Del Norte.....	39
Figure 34 - Charter Microwave Feed from South into Del Norte.....	40
Figure 35 - US Cellular Microwave.....	41
Figure 36 - Verizon Microwave Network and Telephony Switches .....	42
Figure 37 - Route Redundancy Possibilities in the Region .....	44

**Executive Summary**

Telecommunications is the central nervous system of the American economy. It has revolutionized virtually every aspect of our lives and every industry, from education and health care to banking and finance. To remain competitive in the world Del Norte County businesses, institutions and residents must have available to them the most advanced telecommunications technologies and services AND the knowledge of how to use them.

We present this Teletransportation/Telecommunications Strategic Plan to Del Norte County with the understanding the work has just begun and that we need to continue our efforts together. Fostering development of a 21<sup>st</sup> century knowledge-based economy means building on our existing strengths while adding additional diversification to the economy. Successful implementation of the recommendations depends on continuing community participation, cooperation and collaboration.

Economic diversification is the cornerstone of a healthy, growing 21<sup>st</sup> century information age county. By taking full advantage of telecommunications, Del Norte County is poised with the opportunity to become a world-class destination for a wide variety of businesses, healthcare, retirees and tourism.

Del Norte and surrounding counties are examples of what has been termed “the rural challenge”. There is a growing awareness of the barrier to economic and quality of life growth presented through the lack of access to advanced telecommunications services (i.e., broadband). There is a growing understanding of the role of telecommunications and what it takes to foster the changes necessary to meet growing demands of the region.

Changes in the area’s economy and demographics are such that now we can bring market opportunities to the attention of other providers and private sector investors. One needs look no farther than the recent Charter announcement for an example. While it took the better part of a couple of years of behind the scenes negotiations and encouragement, the result we expect by late 2007 is nothing less than removing the cork from the bottle that has been containing the genie of economic development hoped for by many in the north county.

Now we need to do the same for the south part of the county.

Additionally, we need to continue to drive the discussion on route redundancy to a new level of awareness. Collaboration with other regional players is required. This is underway and growing.

Education and workforce preparation is underway and deserves to be bolstered and supported by the community to meet increasing demands of the 21<sup>st</sup> century digital economy. This includes tourism new ways to use technology.

Across the county we see “IT using” on a fairly regular basis with impacts on daily tasks. “IT using” includes use of email and web browsing to raise the quality and lower the costs of gathering market intelligence and communicating with suppliers and customers.

There is considerable opportunity to further expand the use of IT in the county, to integrate it more fully into daily operations and lives. “It enhancing” includes developing and integrating

more complex “e-business” applications, such as Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP), that can enable whole new business processes and models, such as automated online supply chain management and online sales into geographically distant markets. This is the next level of IT use and the level at which we see the greatest benefits to an economy.

Successful integration into the 21<sup>st</sup> century economy depends on ubiquitous broadband along with widespread knowledge of how to take full advantage of the resource. Thus the criticality of the role played by the workforce development agencies and education in providing 21<sup>st</sup> digital age education and continuous learning opportunities.

There is a great deal of interest in addressing the future of the county. A number of groups seem to be working toward similar goals but in a somewhat siloed fashion. There is an opportunity to bring greater focus and coordination to these activities. Here’s an opportunity to use the power of modern Web-based technologies to provide enhanced communications between groups (for example, a single Website, blogs or other manifestations of the Web 2.0 upsurge).

Three broad goals are recommended (Activities, Tasks and Responsible Party are spelled out in the body of the report).

### **Goal 1 –Del Norte County’s Telecommunication Infrastructure and Services Match 21<sup>st</sup> Century Demands**

*Encourage and support the continued growth of the Del Norte County telecommunications infrastructure so that employees can be as efficient as possible, healthcare providers can provide the highest levels of care for patients, businesses and all organizations can be competitive as they see fit in the global economy, and residents can have every access to education, information and services.*

- Establish a Standing Information Technology Advisory Committee
- Support and Facilitate Availability of Broadband (90% coverage plus conduit ordinances)
- Support and Facilitate Availability of Quality Cellular Phone Service (100% coverage on major travel routes)
- Support and Facilitate Regional Route Redundancy
- Support the efforts of the California Broadband Task Force
- Establish a regional exchange point
- Identify funding to support continued planning efforts

### **Goal 2 -- Del Norte County’s Workforce Is 21st Century Ready**

*Ensure that all Del Norte County workers have the opportunity to equip themselves with the necessary tools to succeed in their careers and in whatever field they choose in this new and dynamic global digital economy. Encourage entrepreneurship, provide for life-long learning and promote growth of existing businesses. Build on existing programs and relationships.*

- Ensure development of a 21<sup>st</sup> Century Digital Economy Prepared Workforce
- Promote and Support Small Business Growth
- Develop Programs to Ensure Adequate Supply of Trades Workforce
- Evaluate the Potential for Community Development Resource Centers

### **Goal 3 -- Del Norte County Is A Full Participant in the 21<sup>st</sup> Century Economy *and the World Knows It!***

*A knowledge-based digital economy will be a significant component of the 21st century economy and serve as an added dimension for promoting economic opportunities in Del Norte County.*

- Promote Del Norte County's Telecommunication Assets
- Include 21<sup>st</sup> Century Factors In Economic Development Policy
- Continue the Regional Approach to Economic Development
- Develop an "Independent Living" Pilot Project
- Promote Increased Telework/Telecommuting Opportunities
- Promote expanded use of telehealth/telemedicine technologies

Researching and developing this set of recommendations was a great opportunity to discover the positive attributes of Del Norte County, especially its growing telecommunications infrastructure and service offerings. It was exciting to see the Charter announcement and to project the impact from this greatly expanded broadband capacity.

More exciting is the obvious energy and dynamism of a number of the residents and their sincere interest in moving Del Norte County into the 21<sup>st</sup> century. Probably one of the most remarkable finding is the degree to which county residents are willing to pitch in and work together. Del Norte has the potential for a great future.

Achieving the goals identified in this Teletransportation / Telecommunications Strategic Plan will result in positive impacts to the economic climate and will also positively impact the quality of life for residents.

We may not be able to predict the future but we sure can prepare for it.

## Preface

We present this Teletransportation/Telecommunications Strategic Plan to Del Norte County with the understanding the work has just begun and that we need to continue our efforts together. Fostering development of a 21<sup>st</sup> century knowledge-based economy means building on our existing strengths while adding additional diversification to the economy. Successful implementation of the recommendations depends on continuing community participation, cooperation and collaboration.

Our task was framed by the following strategy stated in the “Comprehensive Economic Development Strategy, Del Norte County, California, 2006 – 2008”, Adopted by Del Norte County Board of Supervisors, May 2006:

“Remove barriers to upgrading telecommunications infrastructure by supporting Del Norte Local Transportation Commission policy. Support the Tri-Agency's partnership with the Commission to identify physical, technological and political solutions to regional broadband deficiencies. Encourage the engagement of public entities and private carriers. Foster the development of strategies in pursuing legislative remedies to improve telecommunications.”

We can add diversity and resilience to our economy and share in the successes others have demonstrated are possible. Adoption of the elements of this Plan will provide a basis for regional collaboration and cooperation that benefits public and private sectors, encourages competitive approaches to provisioning of critical services and provides substantial support for pursuing a variety of strategies. This is a strategic plan focusing on policy, not an engineering plan. With this plan we seek to set in place agreed to policies to provide a coordinated approach to the emerging digital economy.

“The implication for policy makers is that a portfolio of broadband-related policy interventions that is reasonably balanced (i.e., also pays attention to demand-side issues such as training) is more likely to lead to positive economic outcomes than a single-minded focus on availability.”<sup>1</sup>

For these recommendations to have meaning, they must be acted upon. Throughout the development of this plan the approach taken was to actualize immediately where possible (e.g., the Charter announcement) and to build paths to actualization through building of relationships. Those relationships are a key to progress and are not readily transferable through written reports. For this reason there is a compelling interest in sustaining the many complex threads under consideration at this writing.

## The Importance of Teletransportation / Telecommunications

### Overview

Telecommunications is the central nervous system of the American economy. It has revolutionized virtually every aspect of our lives and every industry, from education and health care to banking and finance. Between 1995 and 2004, advances in telecommunications and information technology were responsible for as much as 75% of U.S. labor productivity gains.

To remain competitive in the world Del Norte County businesses, institutions and residents must have available to them the most advanced telecommunications technologies and services AND the knowledge of how to use them. The Del Norte County Teletransportation / Telecommunications Strategic Plan, emphasizes coordination with teletransportation / telecommunications efforts of Curry and Humboldt counties towards an integrated and regionally based cooperative strategy; including private sector interaction and legislative remedies where deemed necessary.

In Del Norte County this will have a positive impact on the entire community by expanding opportunities for business development, jobs, access to quality healthcare, and educational opportunities. Likewise, it will serve to leverage the reliance on traditional forms of transportation and commerce, and lessen any negative impacts the county may have due to its physical isolation.

Today we find ourselves confronting rapidly changing economic realities as well as the many existing challenges that present themselves to areas such as Del Norte County. Discussion of ways to move the region forward frequently turns to the impediments of not having widely available and affordable advanced telecommunications infrastructure (i.e., broadband). A recent announcement of advanced telecommunications services from Charter in the region is a good first step forward to removing this barrier to economic and quality of life improvements.

To ensure a continuing expansion of the supply of telecommunications services we need the additional participation of current and emerging telecommunications services providers. It is also in their best interests in serving the public needs (i.e., customers) to be engaged in these planning processes. By no means are we finished with our infrastructure growth. New applications are coming on line everyday and these applications require more and more bandwidth.

Of critical importance is to recognize that having the tools to enable our future as a 21<sup>st</sup> century knowledge-based economy at our disposal is only one part of the equation. A parallel effort needs to occur on the demand side of the equation. Here we must assist our residents, businesses, educators and others in understanding how to integrate these technologies into their lives, whether for profit, for service, or for entertainment purposes. Lifelong education and workforce development absolutely must be addressed for us to succeed with these tools.

Economic diversification is the cornerstone of a healthy, growing 21<sup>st</sup> century information age county. By taking full advantage of our telecommunications infrastructure, Del Norte County is poised with the opportunity to become a world-class destination for a wide variety of businesses, healthcare, retirees and tourism. A 21<sup>st</sup> century county benefits from leveraging the

communication technologies available to it, improving the quality of life and standards of living for all residents. Listed here are just a few of the ways in which we will all benefit:

- Access to world-class telecommunications services that will enable community leaders to actively recruit companies to the county.
- Family wage jobs will become the rule and not the exception due to expanded employment opportunities.
- New options will become available for businesses to establish operations in rural areas as well as providing employees with the choice of working from their homes.
- Educators and students alike will have the opportunities to develop skills and knowledge by employing telecommunication services to work with and learn from people around the world.
- Healthcare options will grow dramatically for communities and their residents in the area. Online consultations, diagnostics, and patient monitoring will be available to those requiring special assistance. Medical staff will have access to state-of-the-art training.
- Public safety, of greater concern than ever before, will operate with improved efficiency and responsiveness.
- Housing will become more affordable due to rising incomes of prospective homebuyers.

### **Broadband Matters -- Here's Why!**

Quantitative studies conclude that

“...communities in which mass-market broadband was available experience more rapid growth in employment, the number of businesses overall, and businesses in information technology (IT) intensive sectors. The assumed, and oft touted, economic impacts of broadband are both real and measurable.”<sup>2</sup>

Yet perhaps we should not be too surprised that many are not yet acquainted with the myriad benefits of broadband nor how it impacts the economy and quality of life for a region. After all this has been one of the fastest growing phenomenons of human history. Widespread availability and use of cost-effective, always-on, faster-than-dialup access to the Internet is a relatively recent phenomenon in the U.S., with the first commercial deployments appearing only in the second half of the 1990's.

The businesses, institutions, communities, and residents that leverage the Internet will thrive, and those that do not will falter. The Internet today is the major transportation network for the economy of the 21<sup>st</sup> century. Each day sees additional recognition of just how essential it has become for business and 21<sup>st</sup> century society. Too often we forget that even while its dominance grows, it is still in its infancy as the key infrastructure underlying the global economy. We need to remind ourselves that the first major commercial browser permitting easy access to the “World Wide Web,” Netscape, was introduced in 1995, a mere ten years ago. At that time our only access to the Internet was over slow and often unreliable dial-up modems. Now in many locations we have access to faster and more reliable broadband. Since that time of the first commercial browser, the Internet and the World Wide Web has leveled the playing field around the globe.

Measuring the economic impact of broadband is difficult, as broadband does not act on the economy by itself, but in conjunction with other IT and associated organizational changes. The effects of broadband may be strongest in non-farm, non-manufacturing industries, where productivity improvements are typically less well captured by economic data.<sup>3</sup>

### Impact of workplace broadband

Adoption of broadband-enabled IT applications can affect the economy by changing the behaviors and productivity of both firms and individuals. Studies have focused on changes to firm behavior, finding that these generally lie on a spectrum, with the highest payoffs in enhanced productivity appearing in the firms that commit most intensively to integration of IT into new business processes. For example, a number of researchers distinguish between “IT using” and “IT enhancing” firms. The former simply adopt existing Internet applications to make current business processes more productive: for example, they use email and web browsing to raise the quality and lower the costs of gathering market intelligence and communicating with suppliers and customers. The latter develop and integrate more complex “e-business” applications, such as Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP), that can enable whole new business processes and models, such as automated online supply chain management and online sales into geographically distant markets. To the extent that the availability and use of broadband fosters either type of IT adoption and usage by firms, productivity improvements and other associated economic impacts follow.<sup>4</sup>

Other studies have focused on the effects of IT on individual workers. IT tends to complement workers that perform non-routine problem solving and complex communication tasks, but substitutes for workers who perform cognitive and manual tasks that can be accomplished by following explicit rules. While both effects could be expected to increase productivity, the overall effect on employment is ambiguous and would depend on the mix of different types of jobs in the economy.<sup>5</sup>

### Impact of residential broadband

While much of the IT productivity literature has focused on workplace usage, much of the focus of broadband policy has been on residential deployments. Broadband at home may of course be used for leisure pursuits, but it can also be expected to affect the economy both directly and indirectly. For many knowledge workers, a residential broadband connection is a prerequisite for working at home (enabling productive use of non-traditional working hours, flexible work arrangements, or remote employment), or for establishment of a home-based business, such as an individual consultancy (contributing to new business formation). Less directly, expanded broadband availability at home may raise the quality of the labor force, for example through improved access to educational opportunities via distance education programs, thus making a locale more attractive to potential employers. Similarly, home-based access may improve quality of life, for example by enabling more participation in community and civic activities, making a locale more attractive to potential residents. Somewhat more directly, home-based access may enable more effective (i.e. online) job hunting, reducing unemployment by making labor markets more efficient. It may also make workers more productive by reducing the overall time needed for them to fulfill non-work obligations, e.g. via online bill payment, shopping, telemedicine, and so forth. As with firm usage of IT, however, the overall effect of home-based broadband usage on local economic indicators is not obvious *a priori*. While online banking and shopping may make local workers more productive, it is also likely to put competitive pressure on local banks and retail stores, leading to ambiguous effects on the number of local jobs.<sup>6</sup>

## Implications for policy-makers

“The present study [“Measuring Broadband’s Economic Impact”] has several clear implications for policy-makers. The most obvious and important implication is that broadband *does* matter to the economy. Policy makers who have been spending their time or money promoting broadband should take comfort that their efforts and investments are not in vain. Many significant public policy reforms and programs are in place or under consideration at the federal, state, and local levels to ensure competitive availability of broadband to all U.S. citizens, stimulate ongoing investment in broadband infrastructure, and facilitate the education and training that small business and residential customers need to make effective use of broadband’s capabilities. Such policies are indeed aimed at important goals. Broadband is clearly related to economic well-being and is thus a critical component of our national communications infrastructure.”<sup>7</sup>

“The implication for policy makers is that a portfolio of broadband-related policy interventions that is reasonably balanced (i.e., also pays attention to demand-side issues such as training) is more likely to lead to positive economic outcomes than a single-minded focus on availability.”<sup>8</sup>

Appendix 3 contains in-depth description of areas impacted by broadband highlights some of the significant driving factors of the added value gained through ubiquitous broadband, why it is no longer a luxury item but now rises to the level of “critical” for daily living. These uses and benefits also point to why broadband is more than ever a matter of public AND private policy.

## Implications of the new Digital Economy<sup>9</sup>

In the new global economy information and communications technology (IT) is the major driver, not just of improved quality of life, but also of economic growth. Moreover, there are strong indications that IT has the potential to continue driving growth for the foreseeable future. Yet, most policymakers do not adequately appreciate this fundamental reality. In fact, after the post-2000 economic dip many concluded incorrectly that the IT economy was smoke and mirrors.

The reality is that while the benefits of new technologies are often exaggerated at first, they often turn out to exceed initial expectations in the moderate-to-long term. This is exactly what has happened with the digital revolution. The digital economy is more than fulfilling its original promise, with digital adoption rates exceeding even the most optimistic forecasts of the late 1990s. The integration of IT into virtually all aspects of the economy and society is creating a digitally enabled economy that is responsible for generating the lion’s share of economic growth and prosperity.

Notwithstanding the centrality of IT to economic growth, there have been surprisingly few attempts to catalogue what is known about IT’s impacts on the economy:

- Productivity
- Employment
- More efficient markets
- Higher quality goods and services
- Innovation and new products and services.

In order to better understand IT’s role in economic growth it is important to realize that the digital economy is more than an economy conducted on the Internet. Rather, it represents the pervasive use of IT (hardware, software, applications and *telecommunications*) in all aspects of

the economy, including internal operations of organizations (business, government and non-profit); transactions between organizations; and transactions between individuals, acting both as consumers and citizens, and organizations. IT has enabled the creation of a host of tools to create, manipulate, organize, transmit, store and act on information in digital form in new ways and through new organizational forms. And its impact is pervasive as it is being used in virtually every sector from farming to manufacturing to services to government.

Importantly, the “IT engine” does not appear likely to run out of gas anytime soon. The core technologies (memory, processors, storage, sensors, displays, and communication) continue to get better, faster, cheaper, and easier to use, enabling new applications to be introduced on a regular basis. Moreover, the adoption of digital technologies by organizations and individuals continues to grow.

There is no doubt that the IT revolution has enhanced quality of life, from improving health care, to making it easier for children to get better information and learn more, to giving consumers more convenience in their interactions with business and government and making it easier to measure environmental quality. But while these and other benefits are important, perhaps *the most important benefit of the IT revolution is its impact on economic growth*. The diffusion of information technology and telecommunications hardware, software, and services turns out to be a powerful driver of growth, having an impact on worker productivity three to five times that of non-IT capital (e.g., buildings and machines). In fact, in the United States IT was responsible for two-thirds of total factor growth in productivity between 1995 and 2002 and virtually all of the growth in labor productivity.

While these productivity impacts from IT are among the highest in the United States, most other nations have benefited from the IT revolution as well. Economists have found significant impacts of IT on the productivity of firms in many other nations, including Australia, Canada, Finland, France, Switzerland. Moreover, while its impact is not as large in most developing nations, IT is making a difference there as well, in part because IT expenditures rose twice as fast in developing nations from 1993 to 2001 compared to the OECD average. For example, IT usage in China was responsible for 38 percent of the increase in total factor productivity growth and 21 percent of GDP growth.

IT boosts productivity in a variety of ways. It lets organizations automate tasks, freeing workers up to create value in other tasks. IT also has widespread complementary effects, including allowing organizations to fundamentally reengineer processes and lets organizations more efficiently use capital and natural resources. IT also has a number of indirect effects, which in turn spur higher productivity, including enabling larger markets and better organizational decision-making.

IT boosts economic output by enabling more people to work. The IT industry itself creates jobs, on average paying 84 percent more than average jobs. Moreover, IT appears to be playing a key role in reducing the severity of the business cycle, allowing the economy to run at full capacity more of the time. Additionally, IT makes it easier for more people to join the workforce, including disabled people and people who cannot work full-time, but who can work part-time or from home. Our standard of living is not just a function of higher levels of efficiency, but of the quality of products and services. IT is helping organizations boost quality. IT enables more information about quality to be collected, giving organizations greater opportunity and incentive to boost quality. IT also makes it easier for organizations to design more customized products

and services, which by definition are of higher quality because they more closely fit the desires of consumers.

Finally, IT is making it easier to create new products and services. IT gives researchers powerful new tools that make discovery easier. Moreover, IT boosts innovation by giving users more of a role in shaping innovation, in part by making research more collaborative.

In short, IT is the major driver of today’s global economy. But just because IT has been the leading engine of growth does not mean that policymakers can afford to be complacent. Ensuring that societies fully benefit from the IT revolution means that policymakers must devote the same, if not higher, level of attention to it than they currently give to more conventional economic policy areas, such as managing the business cycle.

**Transitioning to the 21<sup>st</sup> Century Economy -- *the Digital Economy***

We are now well underway in the transition to the 21<sup>st</sup> century digital economy. This is the century of the knowledge-worker. To compete in this emerging economic reality we need to be connected and we need a population that is prepared to take advantage of the opportunities IT affords.

Each era has critical, enabling infrastructures, for example:

<i>Era</i>	<i>Infrastructure</i>
• Agriculture (pre 1880’s)	Roads, Irrigation, Canals, Ocean Navigation
• Industrial (1880’s - 1980’s)	Electric, Rail, Highways, Telephone
• Knowledge (1980’s - )	Computing, Communications

A knowledge-worker is:

- A problem solver versus a production worker;
- A person who uses intellectual rather than manual skills to earn a living;
- An individual who requires a high level of autonomy;
- A manipulator of symbols; someone paid for quality of judgment rather than speed of work;
- A worker who uses unique processes;
- Someone who possesses un-codified knowledge, which is difficult to duplicate;
- A worker who sources between his ears;
- Someone who uses knowledge and information to add to deeper knowledge and information.

County leadership has a role to play by ensuring that we are taking all necessary steps to realize our potential in the 21<sup>st</sup> century knowledge-based economy. This means fostering

- A competitive market place for continuing growth in the provision of high-speed services that are reliable, affordable and everywhere.
- A highly educated workforce
- Respect and placing value on intellectual property
- Short product lifecycles, quick time to market,

- Lower financial barriers to entry
- Participation in global markets and competition
- A high quality of life

### Assessments – *Where are we?*

We do not exist in a vacuum. What happens at the global, national and state levels have an impact on our county’s telecommunications environment. In the Assessment we looked at the global, national and state telecommunications landscape as well as Del Norte County’s. Our focus is substantially on broadband but we do touch on other telecommunication related topics.

### Del Norte County Profile

In the interest of “not re-inventing the wheel”, we refer the reader to the “Del Norte County’s Comprehensive Economic Development Strategy (CEDS), 2006 – 2008”<sup>10</sup>: The profile of Del Norte presented in that document is sufficiently current and comprehensive for the purposes of this study. We have added a few observations.

### Location

No question Del Norte County is isolated. The nearest major city is Medford, Oregon, which connects to Del Norte County via Highways 197 and 199.

Figure 1 - Highway 199 near mouth of Jones Creek (1920’s)  
From Del Norte County Historical Collection



Figure 2 - Old Redwood Highway

The County airport in the Crescent City area connects to Arcata, San Francisco and Sacramento via three scheduled commercial flights daily.



Figure 3 - County owned McNamara Field Airport adjacent to Crescent City

Del Norte County’s population is 29,000. Del Norte County is geographically and culturally linked to Curry County, Oregon. There is some cross-border commuting between the two jurisdictions. The airport, hospital, and retail facilities in Del Norte County serve both jurisdictions, and the Curry County communities of Brookings and Gold Beach are both partners and competitors for the region’s visitor spending; however, there is no sales tax in Oregon, which provides a competitive advantage to all Oregon Counties over Del Norte County.

Commuting patterns to and from Del Norte County paint an interesting picture.

<b>Area of Residence</b>	<b>Area of WorkPlace</b>	<b>Number of Workers</b>
Del Norte County , CA	Del Norte County , CA	8,323
Curry County , OR	Del Norte County , CA	417
Del Norte County , CA	Curry County , OR	319
Humboldt County , CA	Del Norte County , CA	159
Del Norte County , CA	Humboldt County , CA	104
Josephine County , OR	Del Norte County , CA	73
Del Norte County , CA	Skagway-Hoonah-Angoon CA , AK	21
Douglas County , OR	Del Norte County , CA	21
Del Norte County , CA	Jackson County , OR	20
Del Norte County , CA	Yolo County , CA	19
Siskiyou County , CA	Del Norte County , CA	12
Trinity County , CA	Del Norte County , CA	11
Del Norte County , CA	Douglas County , OR	10
Butte County , CA	Del Norte County , CA	9
Del Norte County , CA	Contra Costa County , CA	9
Del Norte County , CA	Lynchburg city , VA	9
Ada County , ID	Del Norte County , CA	8
Del Norte County , CA	Alameda County , CA	8
Placer County , CA	Del Norte County , CA	8
Mendocino County , CA	Del Norte County , CA	4

Figure 4 - Commuting Patterns in Del Norte County - 2000 census information

## Economy and Jobs

Historically, Del Norte County has depended on the natural resource-based industries of timber extraction/wood products and commercial fishing; both are in severe decline. The county is transitioning from a resource production base to a diverse economic base led by the travel and tourism industry.

The unemployment rate is higher than desired.

Area	Year	Time Period	Labor Force	No. of Employed	No. of Unemployed	Unemployment Rate
Del Norte County	2007	Feb	11,010	10,180	820	7.5

Figure 5 - Employment as of February 2007<sup>11</sup>

Del Norte personal income ranks at the bottom of California counties.

Area Name	Personal Income (Millions of Dollars)			% Change 2003 - 2004	Per Capita Personal Income (Dollars)			2004 Rank In State
	2002	2003	2004		2002	2003	2004	
<b>California</b>	1,147,716	1,184,265	1,262,306	6.6	32,803	33,400	35,219	.
Del Norte	497	532	582	9.4	18,033	19,060	20,534	57
Humboldt	3,085	3,191	3,364	5.4	24,219	24,959	26,224	37
Mendocino	2,255	2,282	2,383	4.4	25,753	25,792	26,956	33
Trinity	287	295	308	4.5	21,689	21,859	22,653	52
<i>Highest</i>								
Marin	16,159	16,211	16,997	4.9	65,382	65,733	69,115	1
<i>Lowest</i>								
Lassen	628	662	707	6.8	18,716	19,408	20,437	58
<b>Oregon</b>	101,882	103,890	109,757	5.6	28,924	29,161	30,561	.
Coos	1,525	1,592	1,661	4.4	24,352	25,224	26,031	18
Curry	515	524	556	6.1	23,974	24,136	25,084	24
Josephine	1,744	1,757	1,865	6.2	22,425	22,273	23,367	31

Figure 6 - Personal income comparisons with other counties in the region<sup>12</sup>

The Del Norte County economy has seen steady modest growth for over 10 years, as seen by wages and salaries (see Figure 7 and 8).

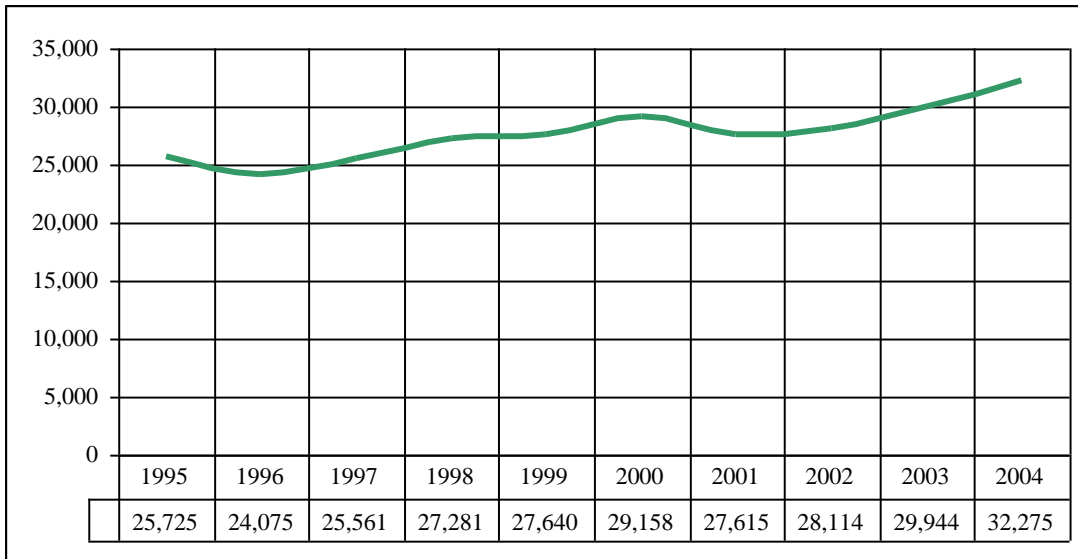


Figure 7 - Average Earnings per Job<sup>13</sup>

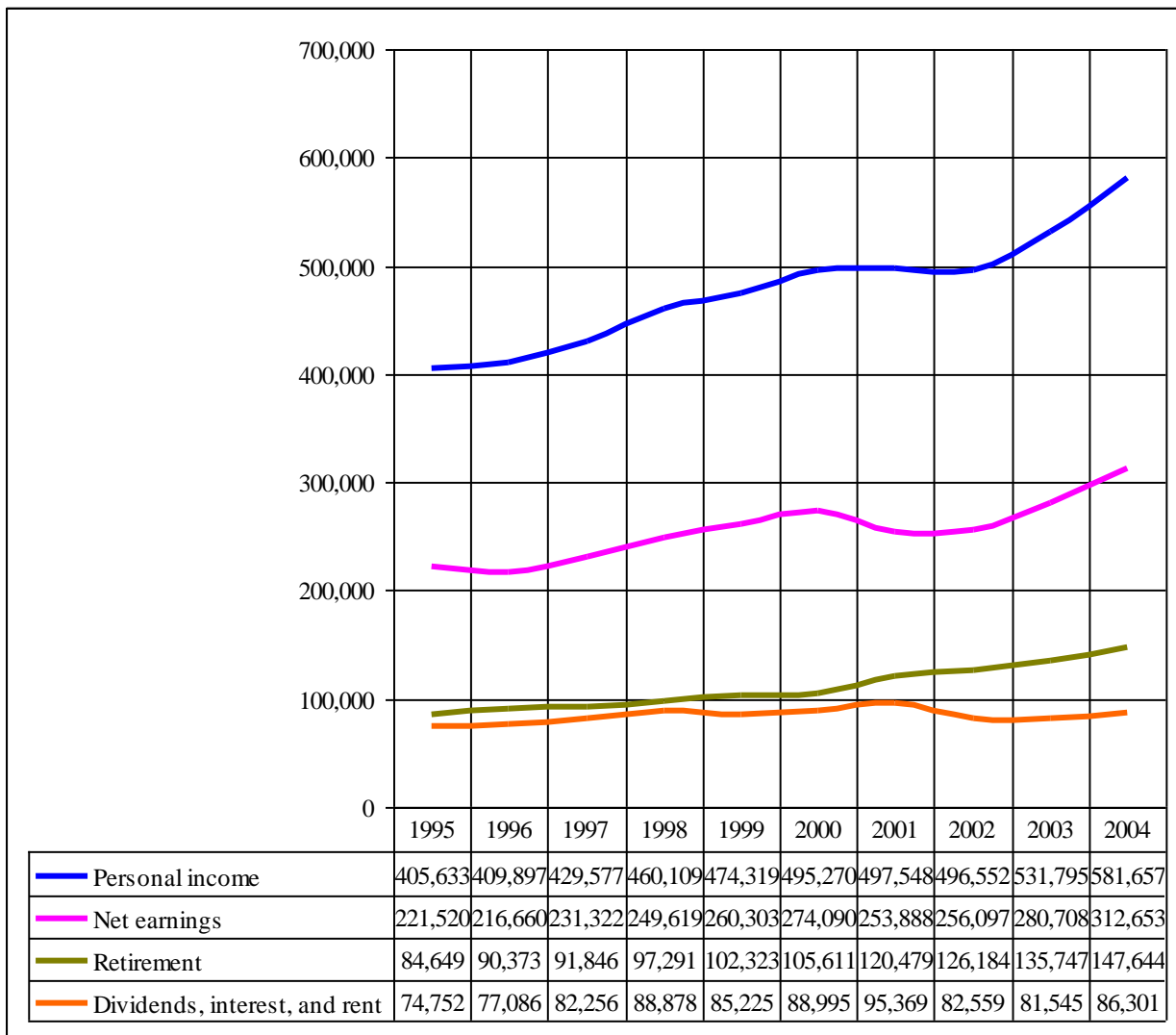


Figure 8 - Del Norte County Income<sup>14</sup>

Increased emphasis on information technology (IT) utilization and innovation drive the 21<sup>st</sup> century economy. Del Norte County has the opportunity to promote its quality of life and expanding broadband capacity. This is an instance where the past may not predict the future. Projecting trends from the past limits constrains our planning options for the future for our economy. We need to factor in the tectonic shift occurring due to the rapid emergence of knowledge-based economies throughout the world and to take advantage of the many resources available today in Del Norte to craft a future that moves us in directions that address this paradigm shift.

For example, there is a disconnect between the projections for per capita income in the future and the ability for those working families to be homeowners. The high and rising cost of home ownership here also makes it harder for businesses recruiting workers from U.S. regions with lower housing costs. We need to 1) increase the stock of affordable homes and/or 2) increase the per capita wage levels, perhaps both. The latter approach has the most benefit to the economy as a whole.

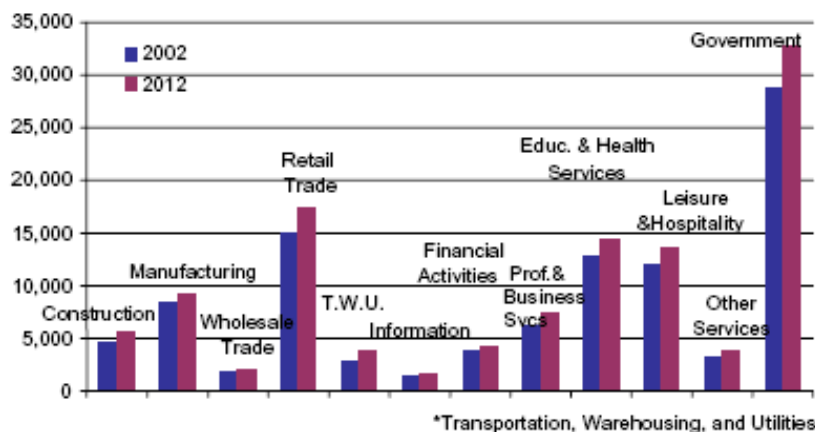


Figure 9 - Fast Growing Occupations in North Coast Region by sector<sup>15</sup>

Top 50 Fast Growing Occupations in North Coast Region					
Occupation	Est. Empl.	Proj. Empl.	Change	%Change	Growth rate %
Computer Software Engineers, Systems Software	30	50	20	66.7	5.2
Criminal Justice & Law Enforcement Teachers, Pos	30	50	20	66.7	5.2
Reservation and Transportation Ticket Agents and T	30	50	20	66.7	5.2
Molders, Shapers, & Casters, Exc. Metal & Plastic	30	50	20	66.7	5.2
Network Systems and Data Communications Analysts	50	80	30	60	4.8
Fitness Trainers and Aerobics Instructors	210	320	110	52.4	4.3
Animal Care and Service Workers	40	60	20	50	4.1
Nonfarm Animal Caretakers	40	60	20	50	4.1
Veterinary Technologists and Technicians	40	60	20	50	4.1
Biological Science Teachers, Postsecondary	40	60	20	50	4.1
Education Teachers, Postsecondary	90	130	40	44.4	3.7
English Language & Literature Teachers, Postsec.	90	130	40	44.4	3.7
Graduate Teaching Assistants	70	100	30	42.9	3.6
Sales Managers	70	100	30	42.9	3.6
Lawyers	220	310	90	40.9	3.5
All other teachers, primary, secondary, and adult	490	690	200	40.8	3.5

<b>Top 50 Fast Growing Occupations in North Coast Region</b>					
<b>Occupation</b>	<b>Est. Empl.</b>	<b>Proj. Empl.</b>	<b>Change</b>	<b>%Change</b>	<b>Growth rate %</b>
Business Teachers, Postsecondary	100	140	40	40	3.4
Nursing Instructors and Teachers, Postsecondary	50	70	20	40	3.4
Art, Drama, and Music Teachers, Postsecondary	100	140	40	40	3.4
Environmental Science Teachers, Postsecondary	50	70	20	40	3.4
Special Education Teachers, Middle School	50	70	20	40	3.4
Heating, Air Conditioning, and Refrigeration Mecha	50	70	20	40	3.4
Other Teachers and Instructors	750	1,040	290	38.7	3.3
Vocational Education Teachers, Postsecondary	130	180	50	38.5	3.3
Postsecondary Teachers	1,390	1,930	540	38.8	3.3
Lawyers, Judges, and Related Workers	240	330	90	37.5	3.2
Self-Enrichment Education Teachers	220	300	80	36.4	3.2
Respiratory Therapists	110	150	40	36.4	3.2
Personal Appearance Workers	80	110	30	37.5	3.2
Hairdressers, Hairstylists, and Cosmetologists	80	110	30	37.5	3.2
Farmworkers & Laborers, Crop, Nursery & Greenhouse	110	150	40	36.4	3.2
Plumbers, Pipefitters, and Steamfitters	190	260	70	36.8	3.2
Sheet Metal Workers	110	150	40	36.4	3.2
Medical Records and Health Information Technicians	140	190	50	35.7	3.1
Environmental Science and Protection Technicians	140	190	50	35.7	3.1
Postsecondary Teachers, All Other	200	270	70	35	3
Special Education Teachers, Secondary School	120	160	40	33.3	2.9
Kindergarten Teachers, Except Special Education	150	200	50	33.3	2.9
Psychology Teachers, Postsecondary	30	40	10	33.3	2.9
Communications Teachers, Postsecondary	30	40	10	33.3	2.9
Agricultural and Food Scientists	30	40	10	33.3	2.9
Advertising and Promotions Managers	30	40	10	33.3	2.9
Education Administrators, Postsecondary	60	80	20	33.3	2.9
Computer Software Engineers, Applications	30	40	10	33.3	2.9
Veterinarians	30	40	10	33.3	2.9
Special Education Teachers, Preschool, Kindergarte	150	200	50	33.3	2.9
Archivists, Curators, and Museum Technicians	30	40	10	33.3	2.9
Graphic Designers	60	80	20	33.3	2.9
Broadcast Technicians	30	40	10	33.3	2.9
Dietitians and Nutritionists	30	40	10	33.3	2.9

Figure 10 – Top 50 Estimated Fastest Growing Occupations in North Coast Region, 2002<sup>16</sup>

*Note: Data for Del Norte County is not available.*

<b>Top 50 Occupations With the Most Job Openings</b>			
<b>Occupational Title</b>	<b>Job Openings</b>	<b>Median Hourly Wage</b>	<b>Education &amp; Training Levels</b>
Cashiers	3,030	\$8.58	30-DAY OJT (11)
Retail Salespersons	1,670	\$9.39	30-DAY OJT (11)
Combined Food Preparation and Serving Workers, Including Fast Food	920	\$7.82	30-DAY OJT (11)
Office Clerks, General	920	\$10.95	30-DAY OJT (11)
Waiters and Waitresses	900	\$7.69	30-DAY OJT (11)

<b>Top 50 Occupations With the Most Job Openings</b>			
<b>Occupational Title</b>	<b>Job Openings</b>	<b>Median Hourly Wage</b>	<b>Education &amp; Training Levels</b>
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	800	\$8.27	30-DAY OJT (11)
Teacher Assistants	750	[3]	30-DAY OJT (11)
Elementary School Teachers, Except Special Education	730	[3]	BA/BS DEGREE (5)
Registered Nurses	720	\$28.91	AA DEGREE (6)
Maids and Housekeeping Cleaners	680	\$8.47	30-DAY OJT (11)
Secondary School Teachers, Except Special and Vocational Education	600	[3]	BA/BS DEGREE (5)
General and Operations Managers	490	\$31.03	BA/BS + EXPER (4)
Bookkeeping, Accounting, and Auditing Clerks	490	\$13.15	1-12 MO OJT (10)
Cooks, Restaurant	470	\$8.92	12-MO OJT (9)
Truck Drivers, Heavy and Tractor-Trailer	460	\$14.10	1-12 MO OJT (10)
Correctional Officers and Jailers	440	\$25.19	1-12 MO OJT (10)
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	440	\$10.08	30-DAY OJT (11)
First-Line Supervisors/Managers of Retail Sales Workers	430	\$15.63	WORK EXPER (8)
Stock Clerks and Order Fillers	430	\$9.34	30-DAY OJT (11)
Maintenance and Repair Workers, General	430	\$13.05	12-MO OJT (9)
Laborers and Freight, Stock, and Material Movers, Hand	430	\$8.96	30-DAY OJT (11)
Food Preparation Workers	390	\$8.44	30-DAY OJT (11)
Receptionists and Information Clerks	390	\$10.29	30-DAY OJT (11)
Child Care Workers	380	\$8.44	30-DAY OJT (11)
Security Guards	350	\$8.97	30-DAY OJT (11)
Landscaping and Groundskeeping Workers	350	\$10.85	30-DAY OJT (11)
Tellers	330	\$10.61	30-DAY OJT (11)
Counter and Rental Clerks	320	\$8.90	30-DAY OJT (11)
Hotel, Motel, and Resort Desk Clerks	320	\$8.58	30-DAY OJT (11)
Police and Sheriff's Patrol Officers	310	\$22.07	12-MO OJT (9)
Cooks, Short Order	310	\$8.29	30-DAY OJT (11)
Bartenders	300	\$8.28	30-DAY OJT (11)
First-Line Supervisors/Managers of Office and Administrative Support Workers	290	\$18.50	WORK EXPER (8)
Gaming Change Persons and Booth Cashiers	280	\$9.72	30-DAY OJT (11)
Executive Secretaries and Administrative Assistants	260	\$16.39	1-12 MO OJT (10)
Carpenters	260	\$26.13	12-MO OJT (9)
Truck Drivers, Light or Delivery Services	260	\$12.15	30-DAY OJT (11)
Social and Human Service Assistants	250	\$11.38	1-12 MO OJT (10)
Fire Fighters	250	\$11.95	12-MO OJT (9)
Secretaries, Except Legal, Medical, and Executive	230	\$12.85	1-12 MO OJT (10)
Automotive Service Technicians and Mechanics	230	\$15.06	POST-SEC VOC-ED (7)
Team Assemblers	230	\$8.96	1-12 MO OJT (10)
Accountants and Auditors	200	\$21.72	BA/BS DEGREE (5)
Middle School Teachers, Except Special and Vocational Education	200	[3]	BA/BS DEGREE (5)
First-Line Supervisors/Managers of Food Preparation and Serving Workers	200	\$11.57	WORK EXPER (8)
Recreation Workers	200	\$9.33	BA/BS DEGREE (5)
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	200	\$17.35	1-12 MO OJT (10)
Industrial Truck and Tractor Operators	200	\$15.67	30-DAY OJT (11)
Dishwashers	190	\$7.82	30-DAY OJT (11)

<b>Top 50 Occupations With the Most Job Openings</b>	<b>Job Openings</b>	<b>Median Hourly Wage</b>	<b>Education &amp; Training Levels</b>
<b>Occupational Title</b>			
Customer Service Representatives	180	\$12.85	1-12 MO OJT (10)

Figure 11 – Top 50 Occupations With the Most Job Openings, 2002-2012, North Coast Region, (Del Norte, Humboldt, Lake and Mendocino Counties)<sup>17</sup>

<b>Top 50 Fastest Growing Occupations</b>	<b>Annual Average Employment</b>				
<b>Occupational Title</b>	<b>2002</b>	<b>2012</b>	<b>Percent Change</b>	<b>Median Hourly Wage [1]</b>	<b>Education &amp; Training Levels [3]</b>
Fitness Trainers and Aerobics Instructors	210	320	52.4	\$13.27	POST-SEC VOC-ED (7)
Lawyers	220	310	40.9	\$31.59	LLD/MD DEGREE (1)
Business Teachers, Postsecondary	100	140	40.0	[2]	MA/MS DEGREE (3)
Art, Drama, and Music Teachers, Postsecondary	100	140	40.0	[2]	MA/MS DEGREE (3)
Vocational Education Teachers, Postsecondary	130	180	38.5	\$28.74	POST-SEC VOC-ED (7)
Plumbers, Pipefitters, and Steamfitters	190	260	36.8	\$20.61	12-MO OJT (9)
Self-Enrichment Education Teachers	220	300	36.4	\$8.92	WORK EXPER (8)
Respiratory Therapists	110	150	36.4	\$23.21	AA DEGREE (6)
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	110	150	36.4	\$11.05	30-DAY OJT (11)
Sheet Metal Workers	110	150	36.4	\$13.42	1-12 MO OJT (10)
Environmental Science and Protection Technicians, Including Health	140	190	35.7	\$14.92	AA DEGREE (6)
Medical Records and Health Information Technicians	140	190	35.7	\$12.35	AA DEGREE (6)
Kindergarten Teachers, Except Special Education	150	200	33.3	[2]	BA/BS DEGREE (5)
Special Education Teachers, Preschool, Kindergarten, and Elementary School	150	200	33.3	[2]	BA/BS DEGREE (5)
Special Education Teachers, Secondary School	120	160	33.3	[2]	BA/BS DEGREE (5)
Cement Masons and Concrete Finishers	180	240	33.3	\$18.90	12-MO OJT (9)
Electricians	190	250	31.6	\$25.47	12-MO OJT (9)
Truck Drivers, Light or Delivery Services	650	850	30.8	\$12.15	30-DAY OJT (11)
Medical Assistants	330	430	30.3	\$12.40	1-12 MO OJT (10)
Computer Systems Analysts	100	130	30.0	\$22.59	BA/BS DEGREE (5)
Veterinary Assistants and Laboratory Animal Caretakers	100	130	30.0	\$10.15	30-DAY OJT (11)
Library Assistants, Clerical	100	130	30.0	\$10.59	30-DAY OJT (11)
Taxi Drivers and Chauffeurs	100	130	30.0	\$8.19	30-DAY OJT (11)
Painters, Construction and Maintenance	310	400	29.0	\$15.17	1-12 MO OJT (10)
Carpet Installers	140	180	28.6	\$15.62	1-12 MO OJT (10)
Social and Human Service Assistants	550	700	27.3	\$11.38	1-12 MO OJT (10)
Helpers--Installation, Maintenance, and Repair Workers	150	190	26.7	\$10.64	30-DAY OJT (11)
Roofers	190	240	26.3	\$14.12	1-12 MO OJT (10)
Computer Support Specialists	160	200	25.0	\$14.38	AA DEGREE (6)
Paralegals and Legal Assistants	200	250	25.0	\$22.76	AA DEGREE (6)
Cabinetmakers and Bench Carpenters	120	150	25.0	\$13.18	12-MO OJT (9)
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	120	150	25.0	\$10.83	1-12 MO OJT (10)
Home Health Aides	420	520	23.8	\$8.04	30-DAY OJT (11)
Police and Sheriff's Patrol Officers	630	780	23.8	\$22.07	12-MO OJT (9)
Counter and Rental Clerks	510	630	23.5	\$8.90	30-DAY OJT (11)

Top 50 Fastest Growing Occupations	Annual Average Employment				Education & Training Levels [3]
	2002	2012	Percent Change	Median Hourly Wage [1]	
Occupational Title					
Hotel, Motel, and Resort Desk Clerks	470	580	23.4	\$8.58	30-DAY OJT (11)
Truck Drivers, Heavy and Tractor-Trailer	1,170	1,440	23.1	\$14.10	1-12 MO OJT (10)
Customer Service Representatives	480	590	22.9	\$12.85	1-12 MO OJT (10)
Retail Salespersons	2,820	3,460	22.7	\$9.39	30-DAY OJT (11)
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	400	490	22.5	\$17.35	1-12 MO OJT (10)
Accountants and Auditors	490	600	22.4	\$21.72	BA/BS DEGREE (5)
Elementary School Teachers, Except Special Education	1,650	2,020	22.4	[2]	BA/BS DEGREE (5)
Pharmacy Technicians	180	220	22.2	\$15.52	1-12 MO OJT (10)
Education Administrators, Preschool and Child Care Center/Program	140	170	21.4	\$15.07	BA/BS + EXPER (4)
Amusement and Recreation Attendants	140	170	21.4	\$7.99	30-DAY OJT (11)
Automotive Body and Related Repairers	140	170	21.4	\$17.04	12-MO OJT (9)
First-Line Supervisors/Managers of Production and Operating Workers	420	510	21.4	\$20.63	WORK EXPER (8)
First-Line Supervisors/Managers of Retail Sales Workers	1,090	1,320	21.1	\$15.63	WORK EXPER (8)
Emergency Medical Technicians and Paramedics	190	230	21.1	\$13.02	POST-SEC VOC-ED (7)
Bill and Account Collectors	190	230	21.1	\$12.57	30-DAY OJT (11)

Figure 12 – Top 50 Fastest Growing Occupations, 2002-2012, North Coast Region<sup>18</sup>  
(Del Norte, Humboldt, Lake and Mendocino Counties)

### Telecommunications Survey

Teletransportation / Telecommunications planners strengthen their policy determination and strategic planning efforts by continually identifying and understanding trends for their region. Decision makers often rely on long-term demographic and economic projections, based on current trends and foreseeable influences, in their strategic planning. Surveys complement information gathered from a variety of sources, for example, demographic analysis or economic projections. These tools are essential for planning and policy determination. However, they alone are not sufficient. Many contributing factors can compound one another in ways difficult to predict.

While the survey was not “random”, and as such not mathematically extensible across all of the population of the region, it did see a sufficiently high enough return rate to help us guide county policy-makers.

Over the month of January – March, 2007 the Del Norte Chamber of Commerce membership and others responded to a survey on various factors related to telecommunications. Surveys were mailed with a SASE for returns.

The results are best used to understand how small to mid-sized businesses of the area think about telecommunication-related factors. When reviewing the responses keep in mind that this survey population was predominantly composed of businesses and government. No attempt was made to directly survey residents. In part because “best practices” research shows that businesses and institutions are the predominant drivers for increases in broadband provisioning in a market.

The response rate of 29% (see Figure 13) exceeded expectations and demonstrates the growing interest in telecommunications issues; reflecting growth in Internet access, importance of advanced services, ownership of personal computers and a number of other factors useful for planning purposes.

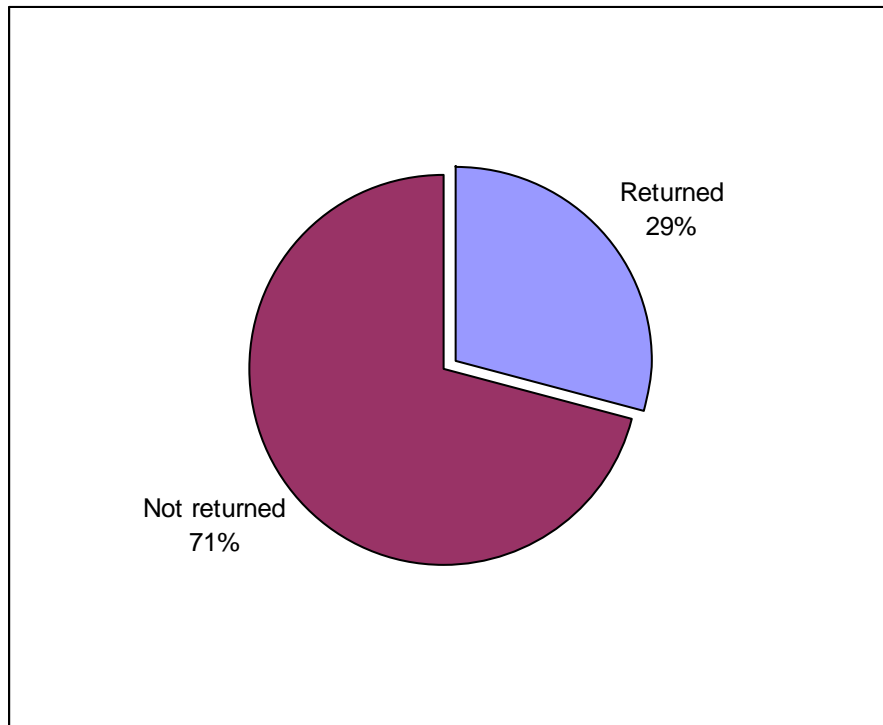


Figure 13 - Survey Response Rate

The response rate (see Figure 14) from Crescent City (61%) when compared to the unincorporated responses (39%) was not unexpected given the address locations of chamber members.

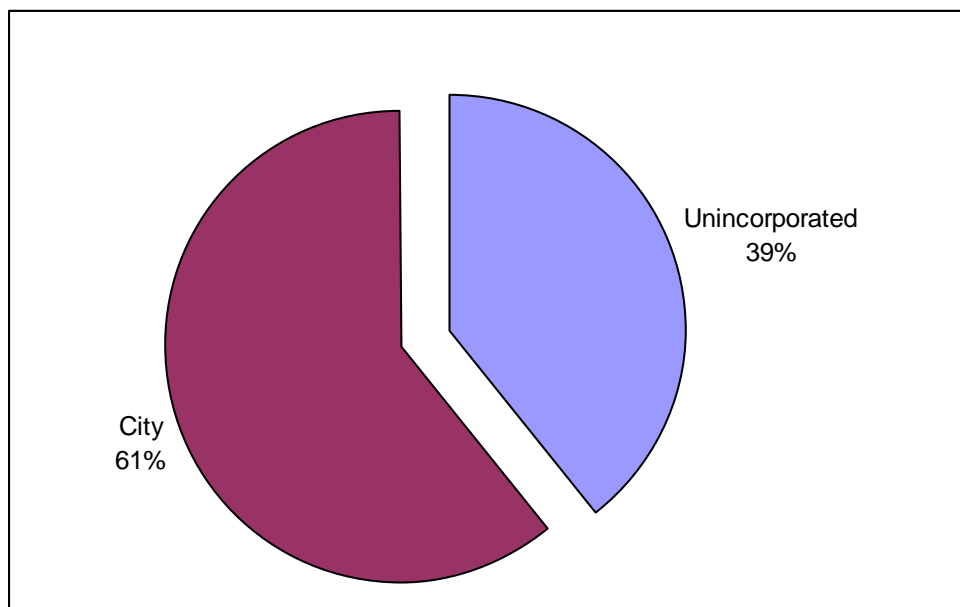


Figure 14 - Areas With Responses

Home Based businesses (see Figure 15) constituted 12% of the survey responses.

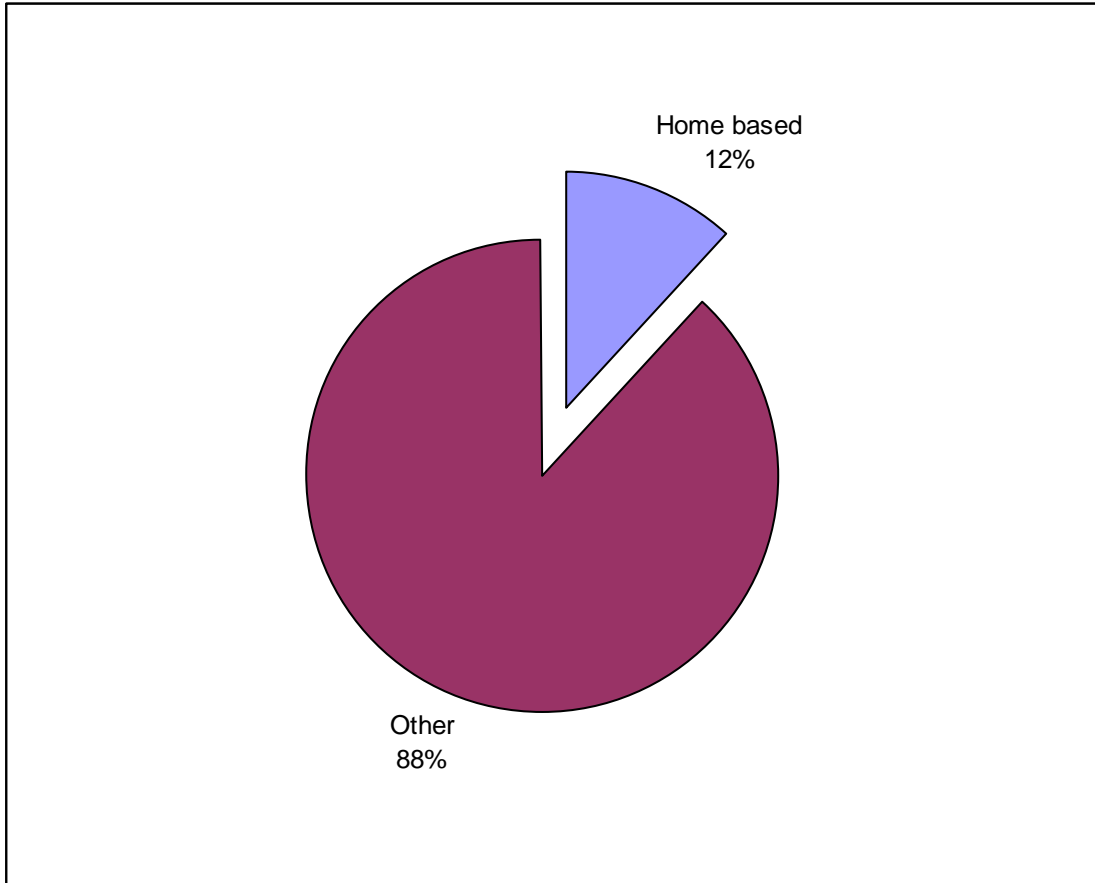


Figure 15 - Home Based Businesses

Survey respondents appear to reflect the chamber composition (see Figure 16). Retail and services composed nearly a quarter of the responses (23%). Real estate and financial services make up 12% of responses. Tourism noticeably was the lowest of the responding sectors at 1%.

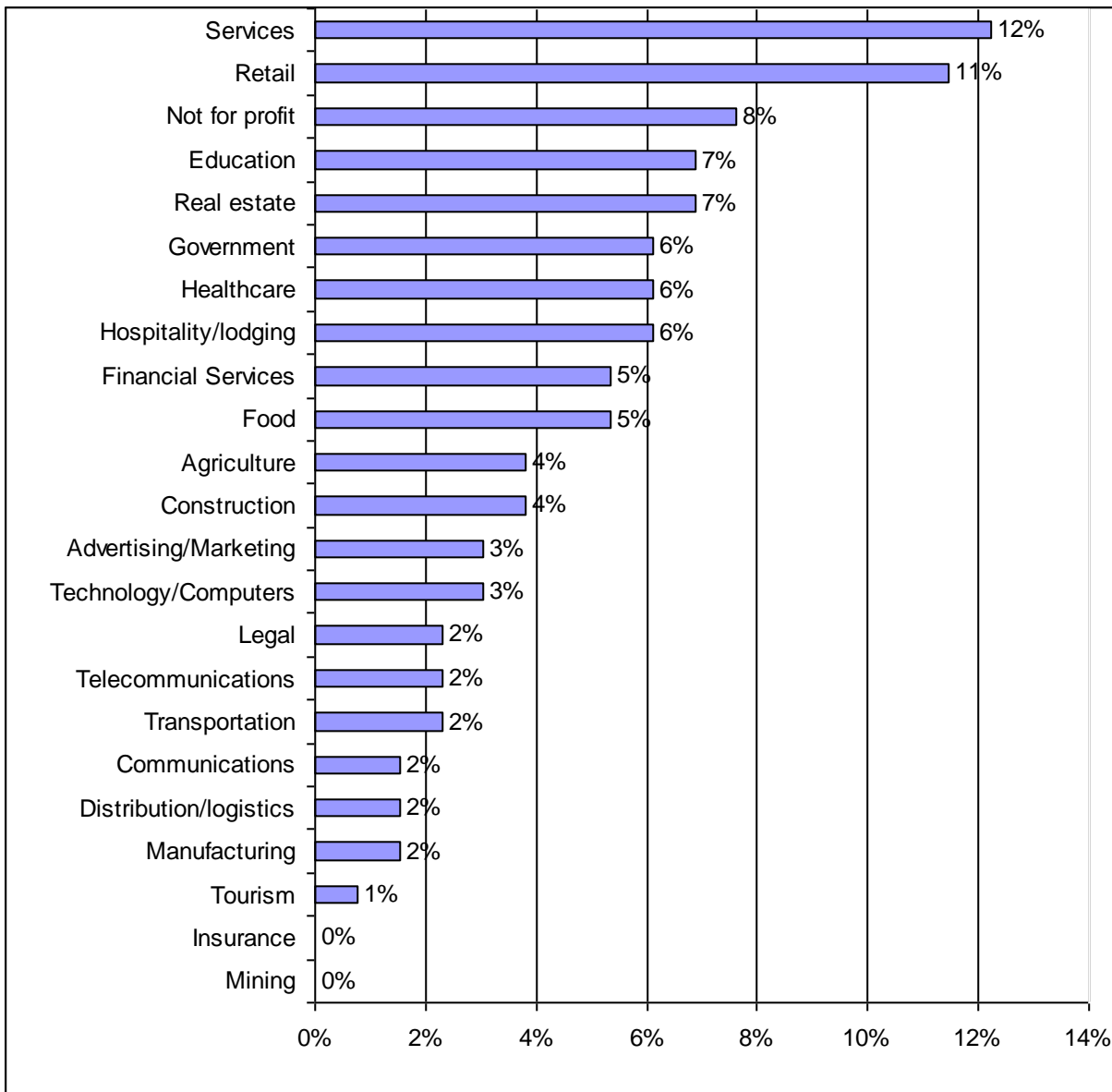


Figure 16 - Sectors

Telecommunications Connections (see Figure 17) indicate the expected high level of landline connections (97%) and a high level of cellular phone connections (71%). Everyone had at least one form of telephony connection. TV connections for cable (44%) and satellite (8%) is on par with expectations, keeping in mind that these were predominantly businesses and government responses. TV reception with an antenna was reported at 0%. Notably the Wireless Internet – Satellite (8%) reporting matched the satellite TV, although these were not the same respondents. It was no surprise to find use of Satellite Wireless Internet given the rurality of the county, although there were a couple of instances where the respondent’s business was apparently located in the Charter cable footprint (not every survey was returned with the business name and/or specific location).

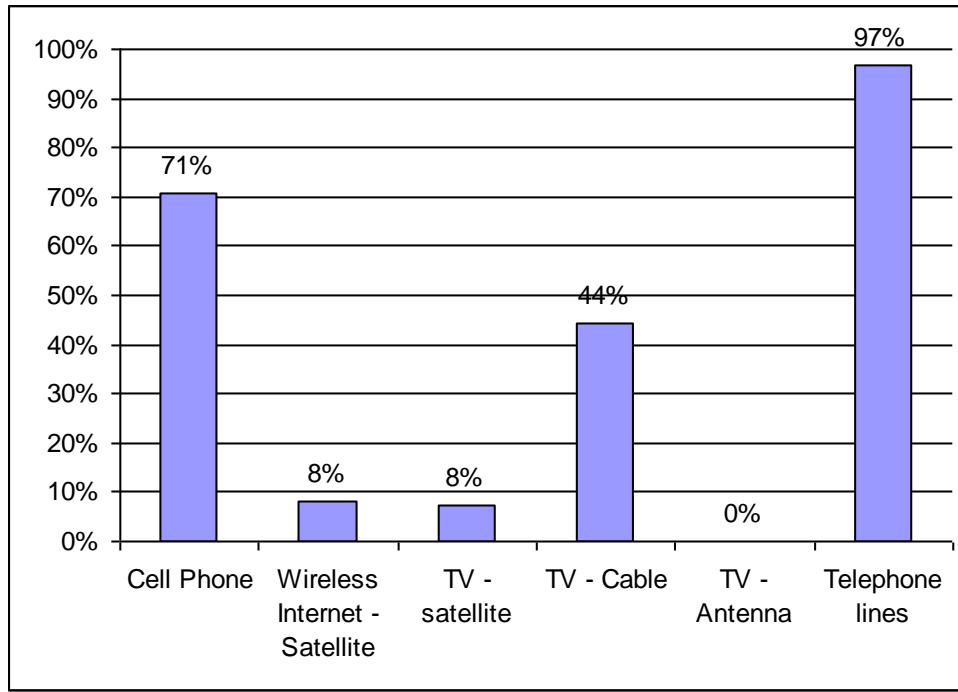


Figure 17 - Telecommunications Connections

Del Norte County businesses and government Plain Old Telephone (POT) usage (see Figure 18) revealed that telephony use is predominantly dedicated for Business (13%). A substantial number of lines are dedicated for FAX usage (66%). Lines dedicated to Internet dial-up were at 13%. Personal / Family Use (33%) was not surprising, and honest.

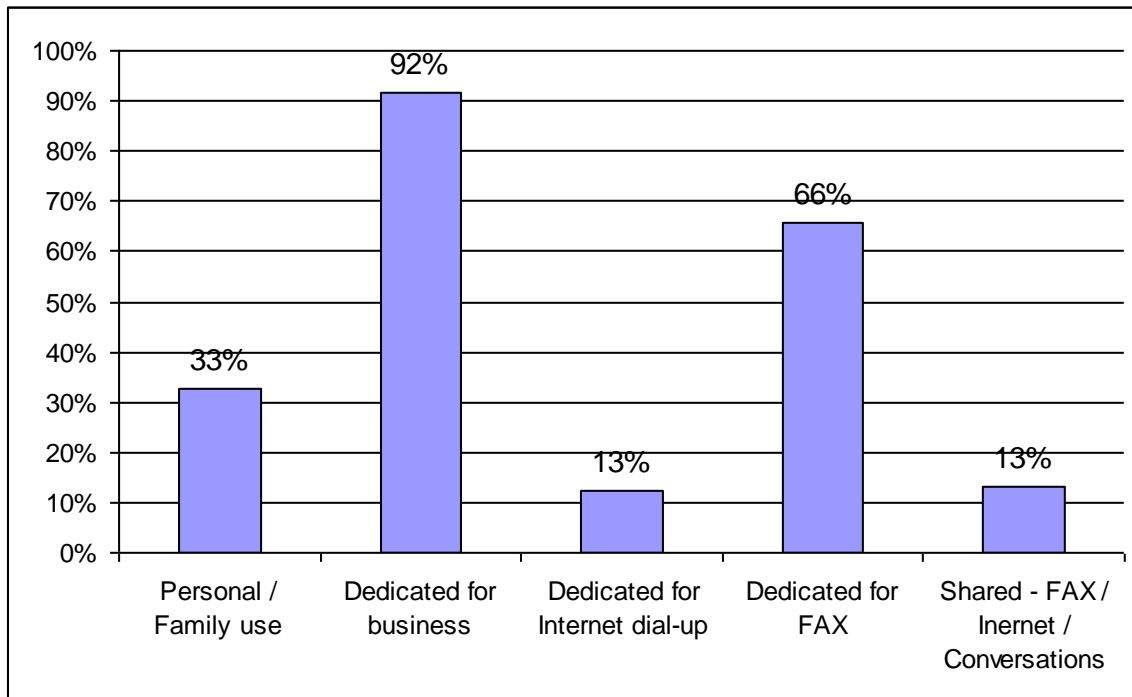


Figure 18 - Plain Old Telephone (POT) Usage

Service provider ratings (see Figure 19) indicated 67% of respondents (Excellent – 11% and Good – 56%) were largely satisfied with their telephony service. This flies somewhat in the face

of anecdotal reporting derived from interviews. There the complaints generally were linked to “rain fade” circumstances or failures due to service interruptions of another source (i.e., this cuts to the route redundancy issues).

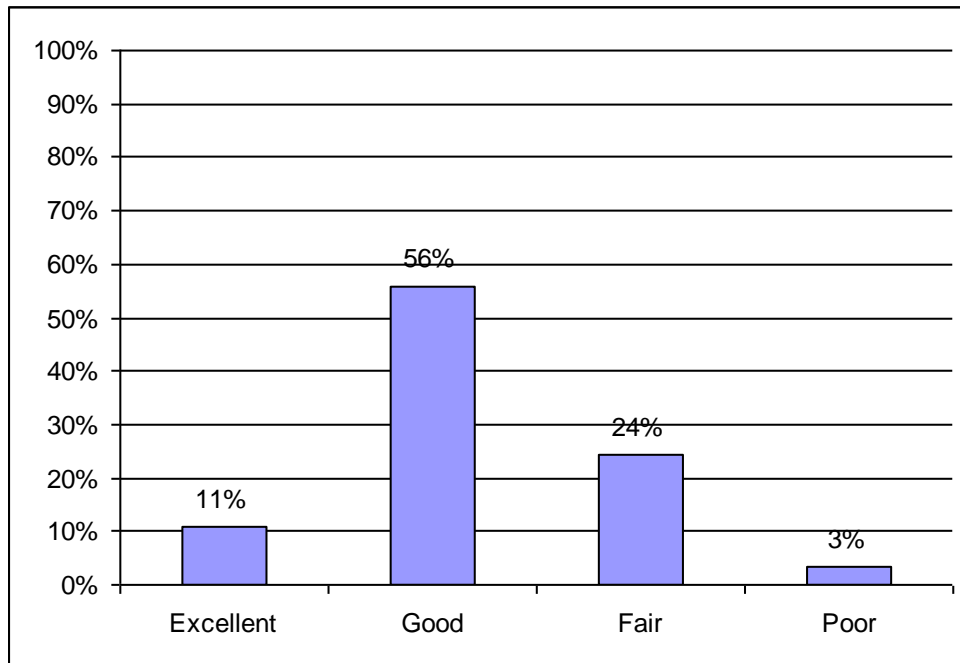


Figure 19 - Service Provider Ratings

PC Ownership and Usage (see Figure 20) indicated a very high level of PC ownership (96%). Word Processing (88%) was the highest indicated PC application. Spreadsheet usage at 75% was a near second. Database (68%), Digital Photography (61%) and Presentations (47%) followed

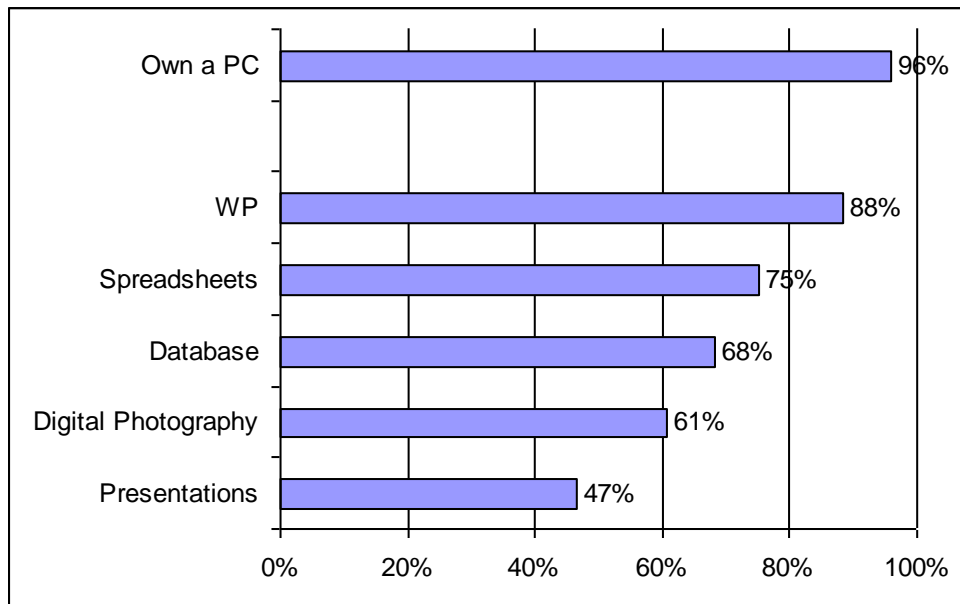


Figure 20 - PC Ownership and Usage

Other reported uses of PCs included:

MCSEs & MCSAs	HVAC control, security
QuickBooks	Real time quotes/stock & mutual fund trades
Geographic Information System	Attendance
Training	Teleconferencing & telehealth specialist services
Cards	Drafting
Brochures.	Web Design
Free WiFi	Programming
Web access	Automotive sites
Email	Online catalog
Computer Aided Design	Video production
Drafting	Artwork
Point of Sale	Visio
Flyers	Distance/online education
Party tickets	Human Resources
Financial systems	Airline and other reservations

A solid 92% reported use of the Internet/Web in their business (see Figure 21). The predominant usage was that of Sending and Receiving Email (90%). Folks are using the Internet/Web to look up information (87%). Online purchases are at 79%. Only 28% report selling goods or services online. These results are consistent with an “IT using” economy.

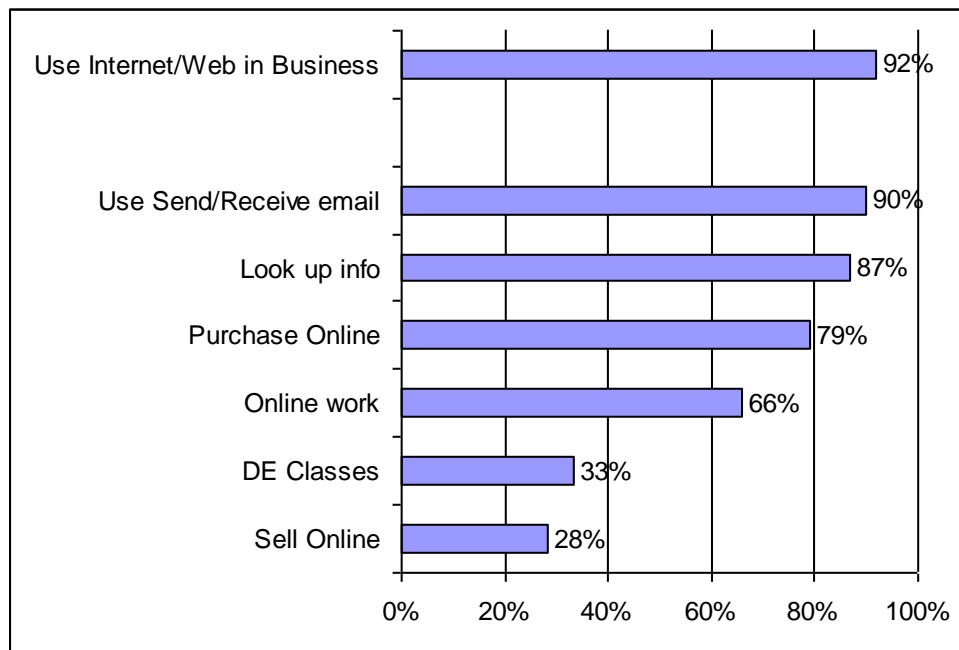


Figure 21 - Business Internet/Web Usage

There is strong interest in Business Management Training (17%) (see Figure 22). Business Communications (29%) was the leading category. A close second was Marketing Strategy (26%). Management and Leadership (23%), Web site design and Maintenance (22%), Business Law (22%), Interviewing and Hiring the Right People (21%), e-Commerce (21%), and, somewhat surprisingly, Achieving Balance at work and at home (21%) all scored very close together. As the respondents were all existing entities it's not too surprising to see the low score for Building and Operating a Business (8%).

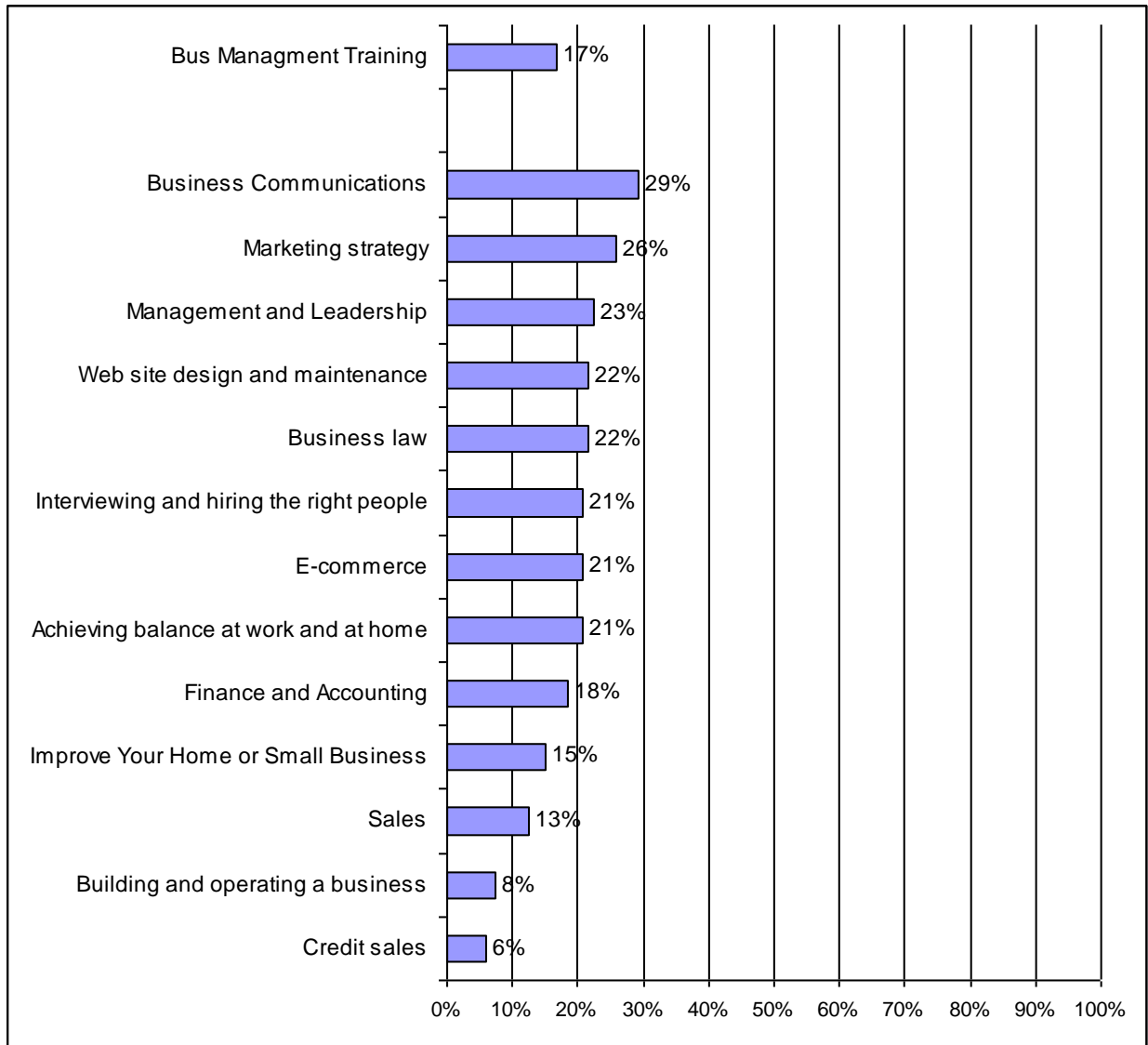


Figure 22 - Interest in Training

Access (see Figure 23) and Speed (see Figure 24) are related. In the Access category 78% rated this as Critical to Very Important. Only 4% rated Access as Not Important.

In the Speed category 76% rated this as Critical to Very Important, whereas 6% rated Speed as Not Important.

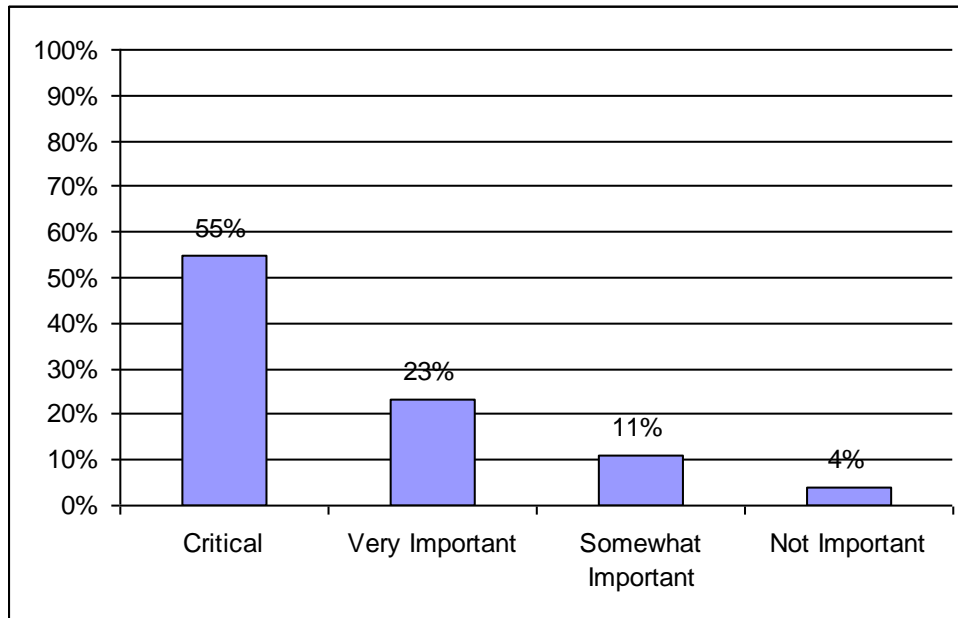


Figure 23 - Access

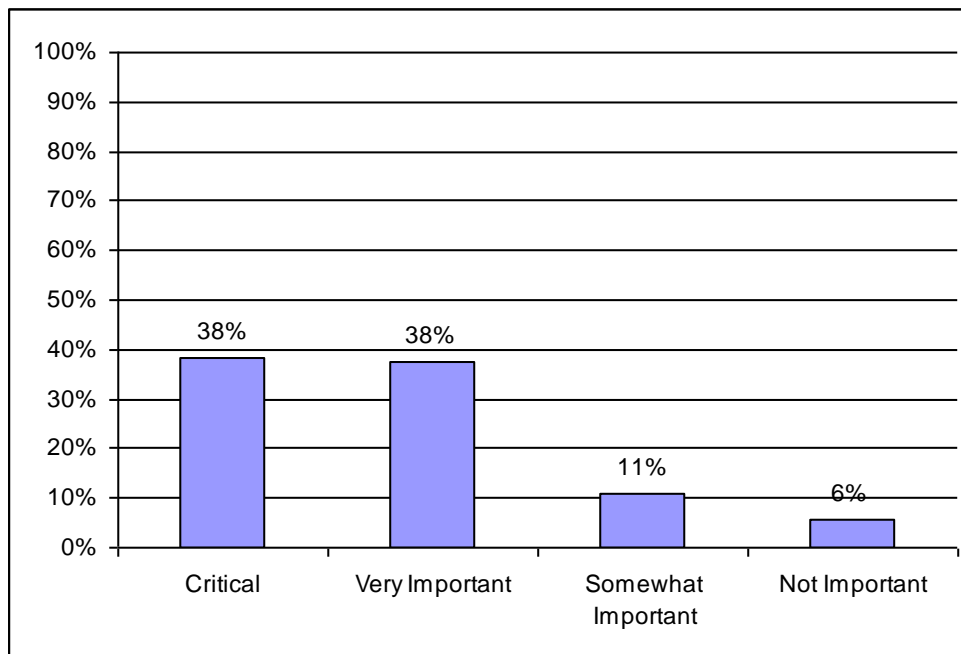


Figure 24 - Speed

Paying for more Speed (42%) (see Figure 25) was not supported fully by the amounts people are willing to pay. Indeed, many reported a willingness to pay for more speed and then indicated a lesser amount than they currently pay. This is consistent with the general lack of understanding of the cost of providing services as well as the value derived from those services. It may very well be that those wishing a lower price point have not as yet realized the full value that can be derived from the broadband service. Yet 26% indicated a willingness to pay over \$60. This is likely to be the price point for Charter's 10 mbps service when it is made available.

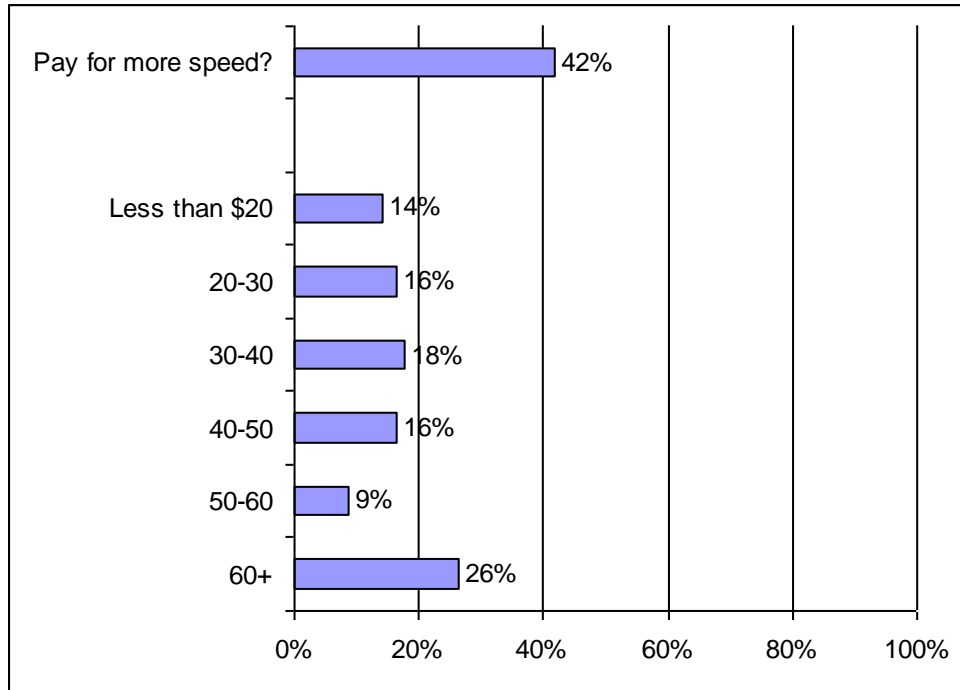


Figure 25 - Price

When asked about their view of telecommunications technologies (see Figure 26) that would be important to the future, many respondents indicated little or no knowledge of Virtual Private Networks, DS/3, Fast Ethernet, Gigabit Ethernet. Again this is not a surprising finding in that the vast majority of those responding were relatively small entities. Wireless (land-based) (32%) was widely seen as the future. DS/3 (23%), Wireless Satellite (22%), T-1 (22%), and Cable (22%) were neck and neck. It's not too surprising to see ISDN (3%) at the bottom of the heap. This is an aging technology that is still used by some in the county, but then so is T/1 technology. However, given the limited service offerings by Verizon, one is not surprised to see T/1, ISDN and DS/3 represented in the mix.

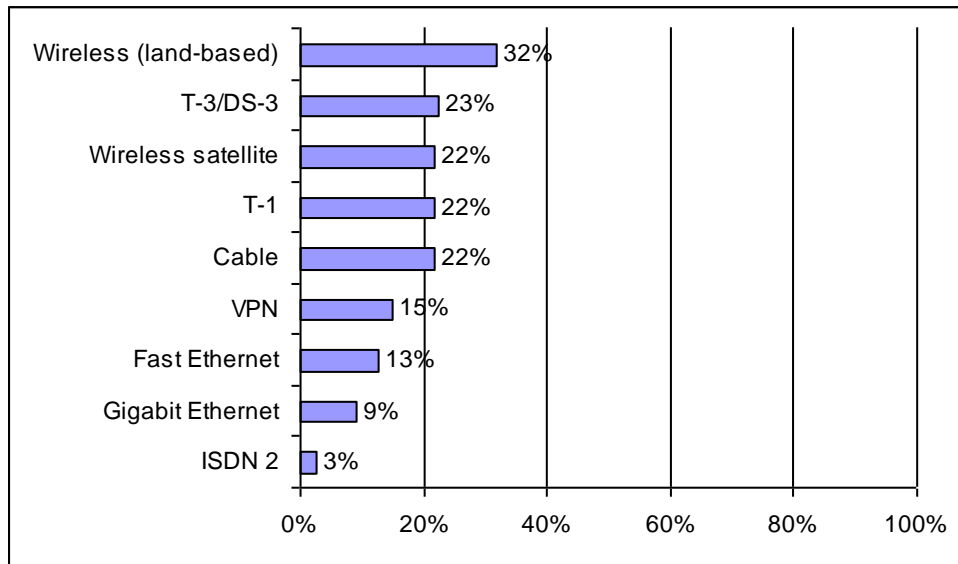


Figure 26 - Future

Interestingly 26% of respondents indicated videoconferencing interest with some on site (8%) and a need for videoconferencing (18%) (see Figure 27). This reflects the view of the importance of face-to-face encounters. Videoconferencing availability would pay for itself in short order in saving of dollars for travel expenses and time to travel.

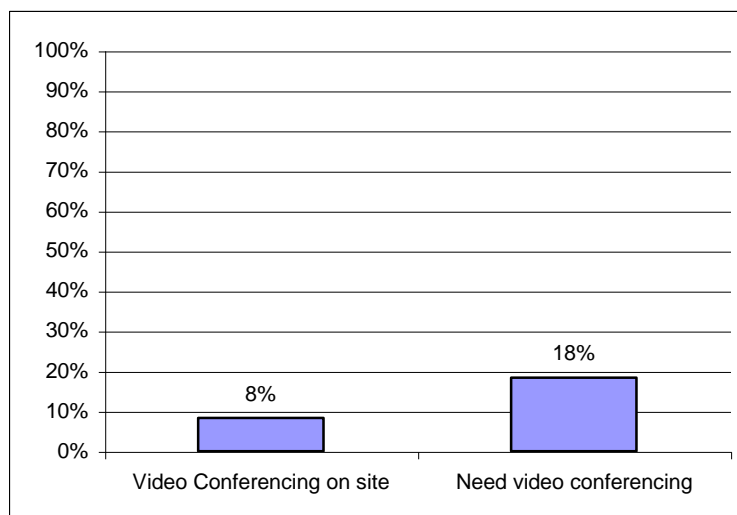


Figure 27 - Videoconferencing

## Comments – Voice:

Many of comments addressed cellular phone issues with reception. Others addressed the way rates are imposed (i.e., tariffs, no “tariff card” in the county, i.e., the CA PUC has not established rates per say and Verizon charges what they want vs. a regulated rate). Some aspects of telecommunications as they relate to public safety were brought up.

- Lack of tariffs
- Reception that is consistent and dependable
- Clear signal
- US Cellular has gotten worse over the years.
- Reception, redundancy
- Limitations on services
- Poor cellular reception
- Intermittent service interruptions for no apparent reason
- Verizon provides a very limited suite of services to business customers. Residential customers have many more options e.g., voice mail, call waiting, etc.
- Telephone -- quality of service is poor - line noise, etc.. Cell need broader/better coverage
- More GETS phone numbers for critical communications during emergencies; Increased number of cell towers to provide better cell service (too many holes currently)
- Use 1 company - right now we use Verizon for local, IDT for long distance
- System sometimes busy
- As cell service improves in DN County we can go to having all 911 calls not coming from highways go directly to the SO and not to Humboldt CHP.
- Not too concerned
- Could be improved
- Slow local phone service if needed on site. Cellular dropped calls too often.
- Price
- Outdated facilities and switches and other infrastructure with local telco
- Up time, quality, cell availability, digital in Klamath
- Still have analog service for all phones -- so can't select some models for use -- voice service is difficult -- Sales
- Expense relative to other areas
- Cell reception is bad here...why doesn't the US go to satellite cell like Europe?
- Better cell service. Too many dead zones.
- Better cell service at reasonable, affordable rates
- Current service has tendency to go out. Need reliable service.

## Comments – Internet/World Wide Web

Route redundancy is mentioned often, as is reliability of services. These are often interrelated issues. Cost and lack of competition are addressed.

- From TV to Internet would be nice to have in the harbor and or wireless Internet
- Lack of options
- I need to be more versatile with skills
- Lack of redundant fiber between Humboldt & the outside world.

- Uninterrupted service
- Redundant fiber
- Employees who work at home in Klamath need high speed Internet.
- DSL needed in Del Norte County
- Speed, bandwidth, redundancy
- High cost of high-speed Internet access
- Internet security/fraud activity, identity theft
- We need broadband in Del Norte County. Even in my small business I'm frustrated trying to move large files to & from my southern clients.
- Need for AFFORDABLE broadband service!
- May turn to conference calls or video training soon.
- Complete a redundant OC3 route into county as back up for equipment or line outages.
- We need DSL. We need more choices to lower prices.
- Can be an invasion of privacy ie - identity theft! But provides access to lots of information technology.
- System down without redundancy
- Needs to be brought into the new century
- Fiber optic needed for local business growth.
- Price
- Redundancy - we need another fiber circuit coming in from another geographic area. We need this badly.
- Faster connection speed
- Bring us into the current century for Internet availability
- Critical in our isolated area -- broadband service would mean more effective use of this tool
- Single provider, expense
- Concerned with downtime of Internet with Charter
- We need DSL in this area
- Good but could be better. High-speed video conferencing.
- College of the Redwoods WAN link between Crescent City and Eureka is two T1's. The monthly fee is outrageous.
- Current service has tendency to go out. Need reliable service.
- There is only one Internet provider other than dial-up.
- More customer access to high speed Internet.
- Privacy - security

### Comments – Video/Television

Quality of cable reception as well as price is mentioned. Quality will improve once Charter has completed the infrastructure improvements on the Oregon coast. Rates are equivalent to other areas in Charter territory.

- Having to have cable and satellite to get local channels if we wanted to have satellite. Also, horrible reception for FX , CBS and NBC always seems to get bad when viewing a big sporting event is on! RRRR
- Cable reception
- Looking into videoconferencing
- High cost of cable TV

- Suggestive programming during children's viewing hours / violent programming on kid's TV shows
- Finish cable to each school site; expand availability for educational video streaming through cable channel 4 or 9.
- We only have Charter and it is very high priced.
- Cable needs to be less expensive
- None
- More ISDN, connecting neighboring cable systems such as Humboldt SuddenLink with DN Charter.
- We use "gather place" to hold meetings (share) -- can show files, etc. on computer -- video might be a great future tool.
- No teleconference capability
- Cable TV is way to expensive!
- Need teleconference capabilities
- Basic cable is priced way above the value content it is providing.

#### Comments - Other (for example, training)

Comments in this category ranged and indicated a diversity of opinions from the region.

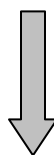
- My Internet use is getting more and more limited with only one dial up line. Some detailed websites cannot display via a phone line, plus having only 1 line for the phone, fax, credit card and Internet generally makes it difficult to use the Internet during business hours.
- We have no redundancy, lack of choices and no tariffs on high speed or PRI's through phone company.
- Most of our mail and electronic business is completed from a home office in Sacramento, but we hope to move that function to Del Norte County -- & therefore we hope the appropriate infrastructure is on available there to support it.
- I am mostly retired. I hire one person in Del Norte. Have several rentals in Arizona. I hire one person there. Love Del Norte.
- RE New Economy Business Skills: Send them to SBDC
- This survey seems like a lot more than a technology survey.
- I have included an idea for a business (IRS DE). I also would like people to realize we should not put "all our eggs in the tourism basket" and think about other businesses that would work in this area, ie, certain manufacturing (surf boards, wet suits, rafts, kayaks, etc.). My connection with the chamber is personal. I do not have a business -- individual membership.
- Sometimes I realize that I must think of the library and also the literacy programs with a "business" type twist in order to obtain public interest. I'm still working on this and look at all opportunities for growth, whether personal, staff or our 2 Americorps Members - volunteers.
- WAN to all sites in Humboldt County
- The DN-Curry Comm. Concert Assoc. is the provider for four classical-popular musical concerts a year at Crescent Elk Auditorium. We are a 501c3 volunteer organization making use of newspaper and radio advertising and announcements. 1) We would like to be on the C of C web page for folks deciding or not to move to our area. 2) We like all publicity possible for our area.

- I would like to see Del Norte work more with Humboldt top bring better service to both counties. Del Norte should work with the Redwood Technology Consortium, Redwood region Economic Development and county.
- We need Verizon fiber optics.
- Need better, faster Internet service. Would enhance business community. Bring additional jobs.
- There does not seem to be a sense of urgency to get us caught up with the rest of the world as far as communications is concerned. We need to bridge this gap. Consensus is that the world stops at San Francisco (being northern CA). WE are northern CA and we have needs for services also, for business and for pleasure.
- This survey does not apply to us.

### Telecommunication Readiness

Del Norte County in many ways mirrors the emerging provisioning and utilization of advanced telecommunications capabilities (i.e., broadband) found elsewhere. Yet, just as in many other areas of our nation, we are by no means at the end of the journey to providing access to broadband or to benefiting from the myriad opportunities afforded by broadband. The more densely populated areas of the county have these resources. Yet many parts of the more rural areas of Del Norte County still have neither “reasonable access” nor “reasonably priced” broadband available to them. Perhaps of comparable concern is the challenge residents face of how to best use these powerful technologies and how to prepare our workforce for the inevitable rise of the knowledge-based economy.

On a generally used “connectedness and readiness” scale, Del Norte County ranks a solid number two and with distinct movement toward the third level of readiness:

- 
1. Services are hard to get or expensive; few use the Internet regularly.
  2. High-speed services are more widely available; local web sites are limited.
  3. General access to high-speed services; web sites support transactions.
  4. Universal access to high-speed services; the Internet has changed the way all organizations operate and is fully integrated into everyday life.

In a connected 21<sup>st</sup> century county:

- High-speed services are reliable, affordable and everywhere.
- Parents participate more easily in their children’s education.
- Public services are on-line 24x7.
- Businesses are dynamic and able to serve the needs of narrower and global markets.
- Work moves to where people want to live.
- Education is more personal and convenient.
- People coordinate with their doctors to practice preventive healthcare.

### **Telecommunications Infrastructure**

First, let’s be clear. Telecommunications is no longer just about making a phone call. In the following portion of the narrative we report on a subset of the information available re telecommunications.

## Global

Telecom revenue worldwide amounted to \$3 trillion in 2006, up more than 11% from the previous year.

The growth of the Internet has delivered a parallel and more flexible network that promises ultimately to overtake and to make obsolete the traditional Public Switched Telephone Network (PSTN). At its current growth rate of over 90% per year, China will pass the US in total broadband subscribers by late 2006 to become the largest broadband country in the world.

The international long-distance market also has undergone dramatic changes over the past 20 years. By 2004, 92 percent of the world's long distance traffic came from markets with competition.

The status of mobile telephones has changed from an expensive executive toy to a basic necessity for 1.7 billion subscribers worldwide.

Global Communications is an extremely complex mix of land, aerial, satellite and submarine cables (see Figure 28). Figure 28 is included to give some sense of this complexity. Note that the majority of transpacific cable landings on the Oregon Coast (11 with 2 in development). This is due to favorably negotiated agreements with fishermen and the Oregon Division of State Lands. It's been stated that the costs of doing a California landing are excessive and constitute a barrier to such landings. This has not stopped these efforts but has certainly slowed the pace.

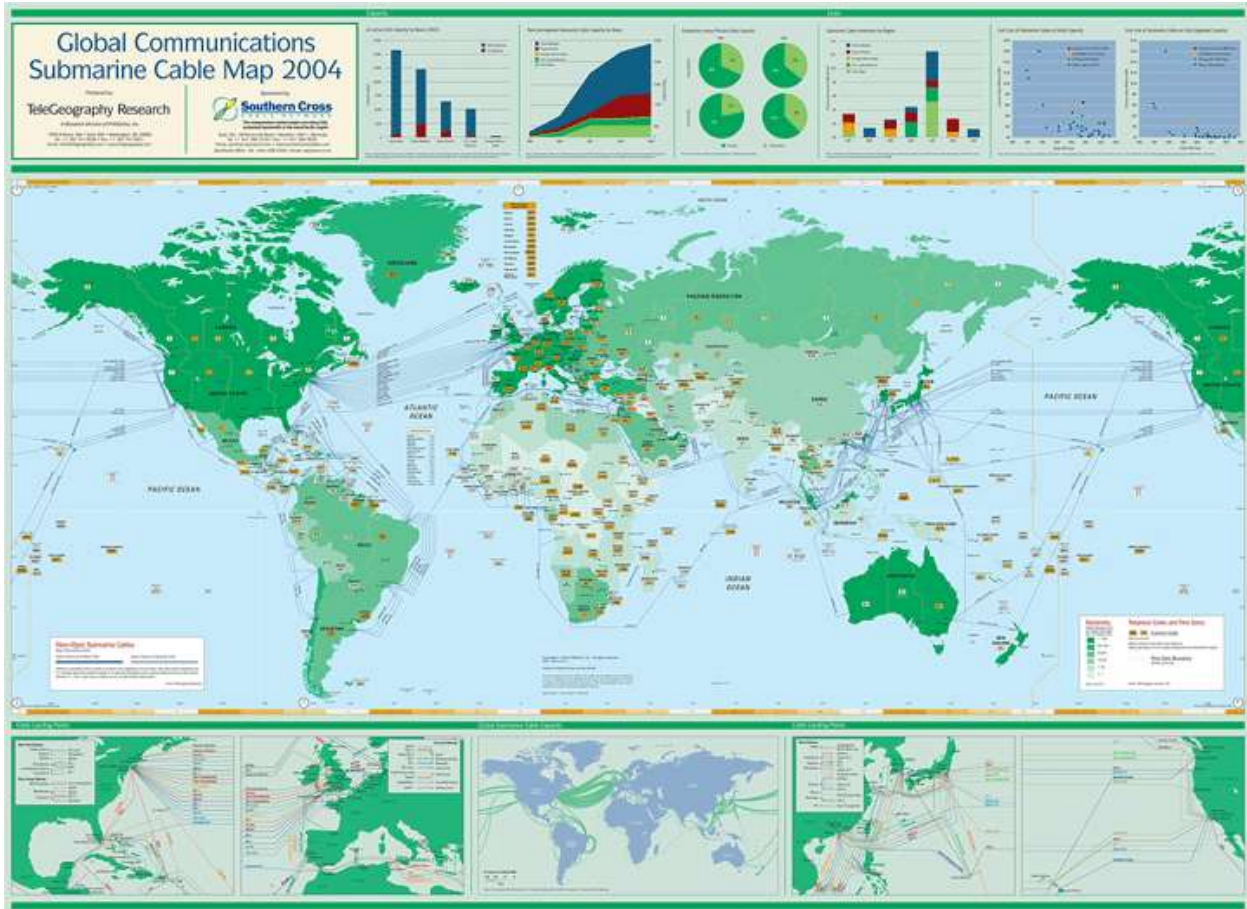


Figure 28 - Global Communications Submarine Cable Map

Figure 29 provides some perspective of global broadband traffic. Simply put, it's huge and growing at an exponential rate.

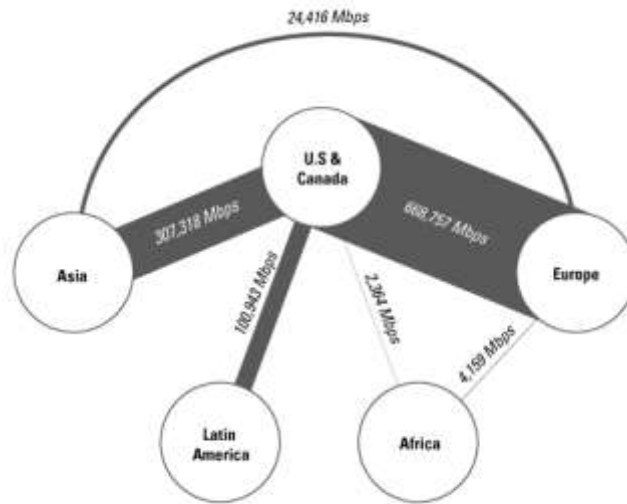


Figure 29 - "US-Centric" Broadband Traffic Rates

### National

Among the challenges we face is our distance to Tier 1 Internet Access Points. A quick look at Figure 30 shows that the nearest Tier 1 points are San Francisco, followed by Seattle. Here's the implication. Local Internet service providers buy their access from secondary and tertiary or deeper levels of access points. That is there are many node hops transited to get to a destination. Every node hop adds a millisecond of delay. Every node hop adds an incremental transit cost. This adds up to poor video quality and costly transit rates. The further one is from the Tier 1 access point, the slower the reception, the poorer the quality of IP-based video and the more costly the connection. Del Norte end users are about as far removed as one can get in the US.

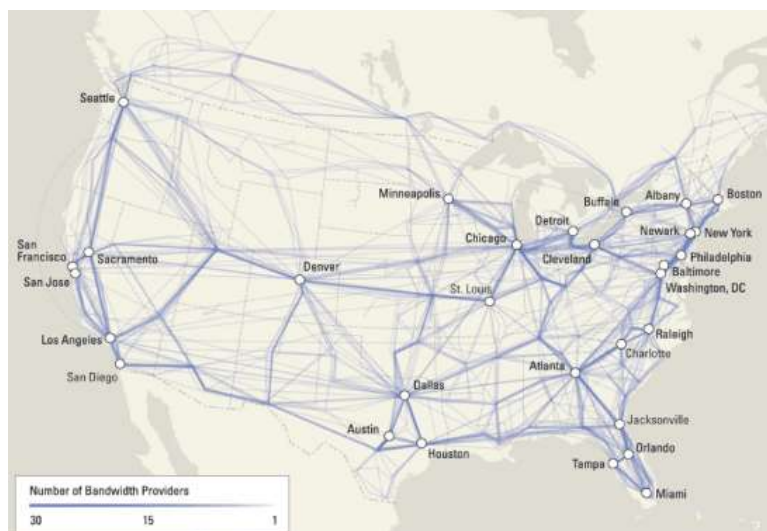


Figure 30 - Map of U.S. City Internet Connectivity

The US has fallen to 19th (or 15<sup>th</sup> depending on sources) overall in household broadband penetration, and is in danger of being passed by Slovenia in early 2007. Even so, over the past ten years, advances in telecommunications and information technology were responsible for as much as 75% of U.S. labor productivity gains.

Another indicator, online sales, has soared. Last Christmas season online spending reached \$667 million on December 13, the highest-earning day of the 2006 holiday season. The first 48 days of the holiday season amounted to \$21 billion spent online. That's a 25 percent increase over the same period in 2005.

The FCC recently announced high-speed lines in the US increased by 52% last year. Of the total high-speed lines reported as of June 30, 2006, 78% served primarily residential end users. Cable modem service represented 55% of these lines while 40% were DSL connections. The Federal Telecommunications Commission readily concedes that our work is not done.

U.S. cable stocks were a sure bet in 2006 as they posted strong growth in phone and Internet subscribers, but the 2007 outlook is a little murkier as telephone companies step up their counterattack. Cable won the 2006 battle; stealing customers from telecom rivals by offering competitively priced "triple play" packages of TV, phone and Internet access.

Still, share performances for phone companies could be muted this year since concerns remain about the costly investment they are making building fiber optic networks for video offerings. Phone companies have to spend several thousand dollars per user to connect their new networks and offer bundled services, while cable operators spend just a hundred dollars, since they do not need new networks.

### California

California has made a commitment to telecommunications for education (see Figure 31). This is great as long as there is a provider to service the commitment. Verizon's Del Norte County Trinidad to Crescent City microwave capacity does create limitations on capacity as well as through frequent interruptions due to "rain-fade". That equipment is alleged to max out at 155 mbps, the equivalent of 4 DS/3's. It doesn't take too much effort to do the math here and to understand why that path is "running out of gas". If one DS/3 is provided to the school system, there's not much left for the rest of the county. This appears to be a factor limiting DSL for the Del Norte County.

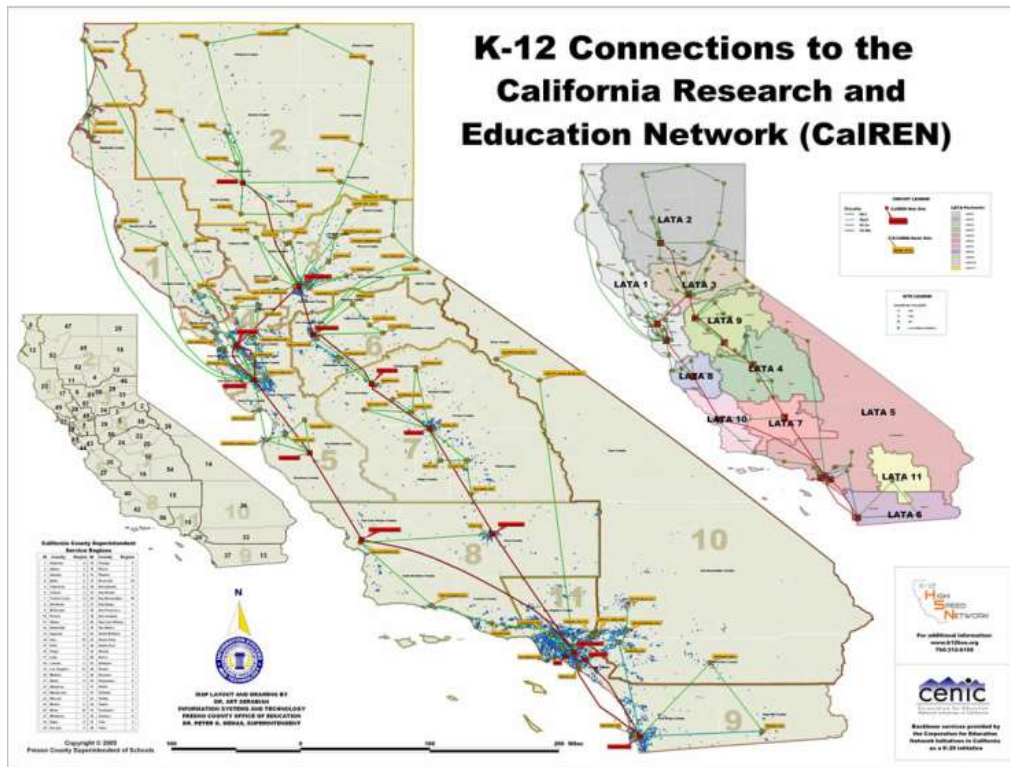


Figure 31 - K-12 Connections to the California Research and Education Network (CaREN)

Getting a grip on just what fiber is where is a very difficult proposition. The bulk of our knowledge comes from anecdotal information, as telecommunications providers do not provide maps to policy-makers to aid them in their decisions. Up to 9/11 competitive reasons were cited. Post 9/11 security reasons have been cited.

So we rely on bits and pieces of information. This is often presented in maps that “represent” the locations of fiber but are never all that accurate. Figure 32 is an example of what we often find, and this is a particularly rich representation.



Courtesy: Victor Braud, of Fiber Channels, Inc.

Figure C-1. Optical Fiber Routes, Existing and Under Construction  
 Figure 32 - One view of fiber in the region<sup>19</sup>

We can use Federal Communications Commission data to develop detailed maps of antennas (see Figure 33); microwave locations, radio frequencies, paths and other data (Figure 34, 35, 36); and other databases to identify telephony switch locations (Figure 39) as well as other related information, such as tandem routing, which is how a long distance call is routed. For Del Norte County all calls leaving the region are routed through Redding. This means that, for example, when someone in Smith River calls Brookings, the call goes down the coast, over to Redding, up the I-5 corridor, across to Coquille area and then back down the coast. *Note: The last sentence in this paragraph needs additional verification. The conclusion is derived from tandem routing information provided through Telcodata.us.*

The reason cited up to now for the long transit has been the LATA boundary on the Oregon-California border. However, these boundaries are now readily waived through an FCC application process. It's up to Verizon to take that initiative.

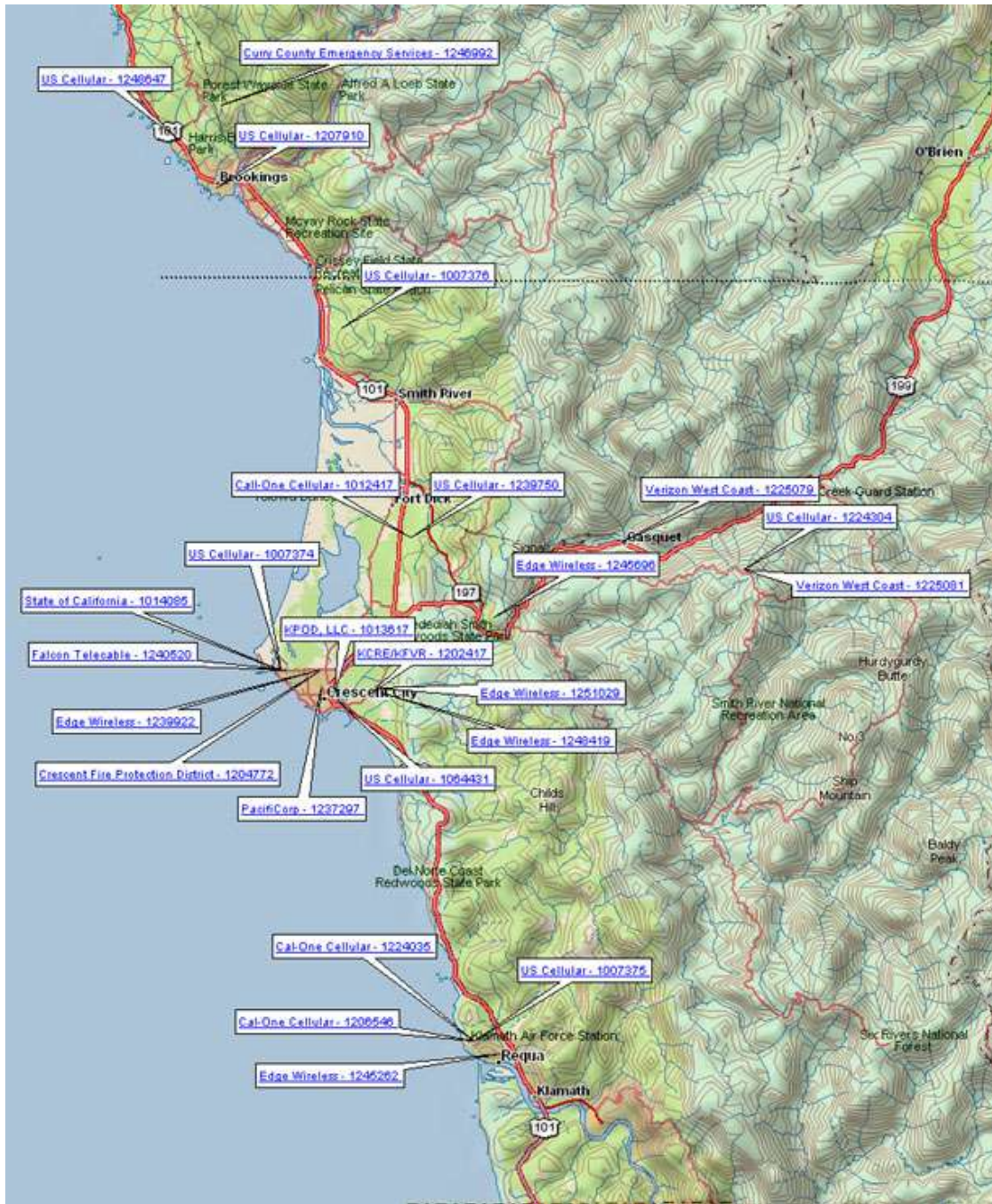


Figure 33 - Antennas in Del Norte

The microwave path for Charter shown in Figure 25 becomes moot with the Oregon coast build. There's a strong likelihood that this facility will be retained for back up. Today this is how much of the subscriber TV is fed into the Charter system for the Oregon south coast and California north coast.

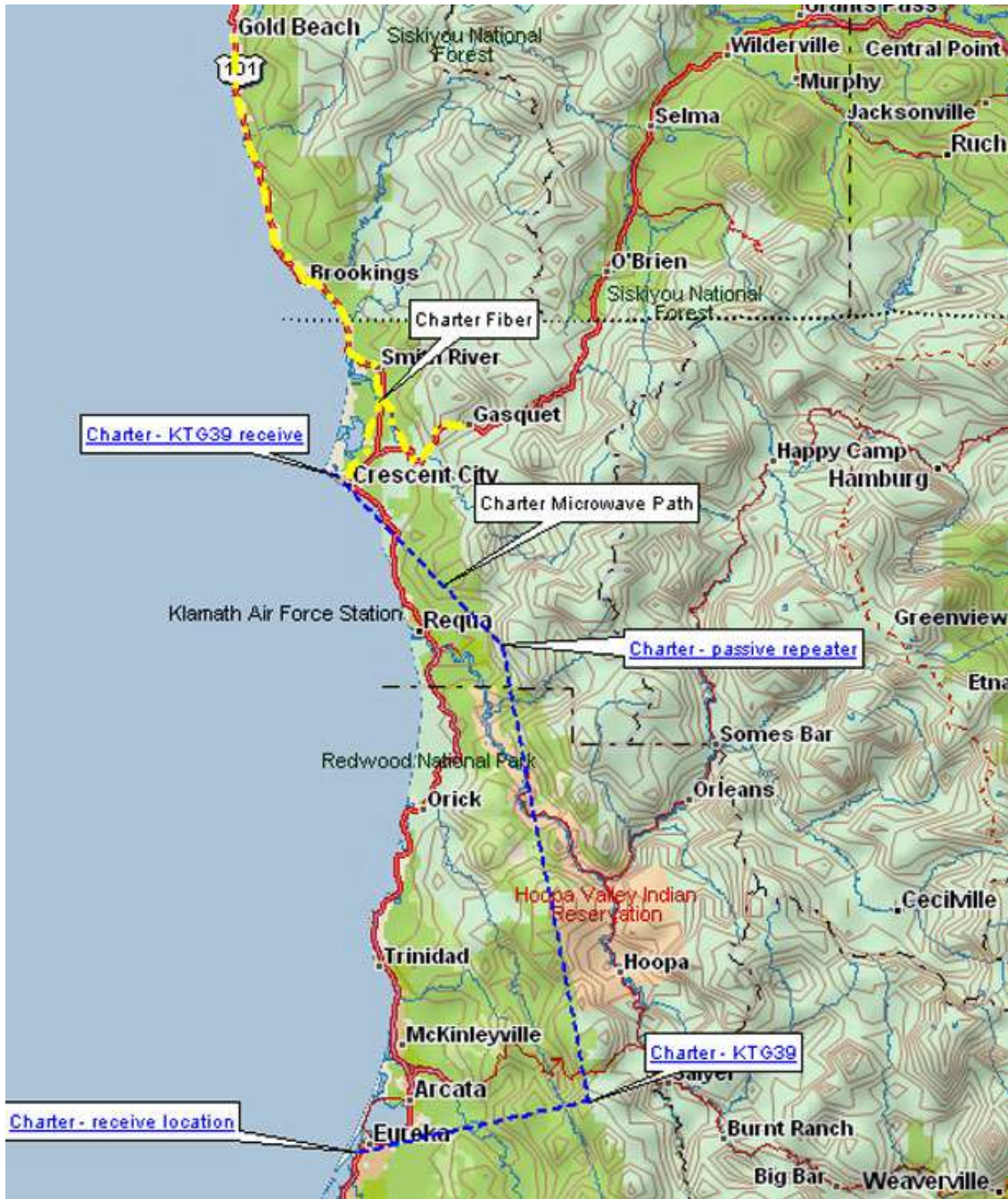


Figure 34 - Charter Microwave Feed from South into Del Norte

Why is it that US Cellular cell phone will work when Edge Wireless is down? Figure 36 gives the answer. They have microwave connections between their towers. Each of these microwave radios is on a US Cellular cell tower. Other providers tend to rely on fiber interconnects or buy transit on some other telecommunications provider's network. Edge has previously used Verizon from the north in the region. So when Verizon experiences an outage, so does Edge.



Figure 35 - US Cellular Microwave

Verizon telephony (see Figure 37) for Del Norte County is delivered by a microwave system that hooks into the SBC/ATT fiber that runs to Trinidad. This map shows switches and microwave radio locates. These are all GPS locates derived from a public database (FCC or Telcodata). So we can get a very precise idea of how the big pieces work together. What we do not have access to are the street-level maps of fiber and copper or the hut locations where the fiber/copper is further divided up and run to homes, etc.

Indications are that Verizon is not willing to make any investments in the county's telephony beyond minimal maintenance nor to expand into broadband. This is a typical scenario for Verizon's approach to its rural properties, of which some in the US NE are now being sold. Their focus is substantially on densely populated urban areas and the growing of their fiber to the premises networks in those areas. Communications with Verizon have supported this thesis.



Figure 36 - Verizon Microwave Network and Telephony Switches

## Route Redundancy

Figure 38 presents some alternatives for route redundancy for the region. First, let's start with what is or soon will be in place. Here I refer to the Charter build on Oregon's south coast that will feed the north Del Norte County. Charter does not disclose investment amounts but we have come to understand they are investing on the order of \$4 to 7 MM in this expansion. On completion (Fall 2007) and finalization of all connections this expansion will bring Gigabit Ethernet connectivity to the area. This is HUGE!

Charter made this investment to make money. For them to make the investment they needed to have assurances outside of their internal marketing and engineering staff. In June of 2006 I was asked to sell them on this investment. We brought them demographics, growth rates, income data and so on. All of which presented a very compelling investment opportunity. Charter rates the area as having the highest "take rates" in the Pacific Northwest.

There's a lesson in this that the consultant has seen repeatedly: we need to bring the market realities of rural properties to the attention of telecommunication company senior management. We can no longer sit back and wait for something to happen.

Four potential routes to route diversity are worth further exploration. The estimates for the first three are very rough. It will take a more detailed engineering study to explore them further. The fourth option, 299, has already been subjected to a significantly more detailed level of analysis.

### Route 199

Charter has 32-count fiber that runs from 101 up 199 to Gasquet. The remaining route is about 75 miles. Using estimates from the Route 299 study (see below -- these would be very rough estimates, indeed) we get a \$5,000,000 build cost and \$240,000 ongoing maintenance and operations cost. There is an existing right of way (ROW) in place using PacifiCorp's ROW that roughly parallels 199.

### Crescent City to Trinidad

This approximate 60-mile route running along or near 101 between Crescent City and Trinidad would connect to the SBC/ATT fiber at Trinidad. Using the FirstMile costs as a very rough guide this would yield a cost of installation of \$3.3 MM and \$191,040 ongoing maintenance and operations cost. The ROW has yet to be established, adding to the installation cost, and this is very rugged terrain.

### Soames Bar to Klamath

This potential route to the I-5 corridor has many unknowns and dependencies. This approximate 60-mile route roughly follows the Klamath River. The costs would be roughly similar to the Crescent City to Trinidad route. The ROW would need to be established, adding to the costs. This also is extremely rugged terrain. This leg depends on having the Crescent City to Trinidad legs in place. This route could be of particular interest to the Yurok Tribe.

### Route 299

Route 299 estimates are available through the "An Alternate Middle Mile Fiber Feasibility Study" produced FirstMile.US in June of 2006. The total estimated cost of installation for this aerial fiber plant is \$8.8 MM (\$59, 864 per mile). The ongoing maintenance and operations cost for this option is \$468K annually (\$3,184 K per mile). Efforts are underway currently to establish a business case for this route.



Figure 37 - Route Redundancy Possibilities in the Region

Other projects of interest

Orick Wireless Broadband<sup>20</sup>

We mention this project as it demonstrates the willingness to explore meeting the rural broadband challenge in a very difficult location, Orick. The project does not appear to be moving forward at a very rapid pace due to challenges relating to funding and sustainability.

This business plan provides an analysis of, and potential for, the deployment of wireless broadband in the Orick area. The proposed wireless broadband system would be a community based service for individuals, small businesses and large, anchor subscribers (e.g., Orick School, Redwood National and State Parks) operating in the Orick area. This business plan lays out why wireless broadband was selected over other Internet choices, the hardware necessary to construct

the system, potential tower sites and access points, possible funding sources, and the steps that are necessary to implement the system. If successful, the Orick wireless broadband system could be used as a model for other rural communities.

This plan recommends that Orick use the 900 MHz band for the point to multi-point access point systems, to provide improved coverage, system reliability, and performance. For the backhaul links between sites, the recommended point-to-point systems are in the 5.8 GHz band, to provide increased bandwidth and high reliability.

### Plan Goals

- To design a wireless broadband system for the Orick community that can also be used as a template for other rural communities in Humboldt County;
- To provide a total aggregate bandwidth of 5 MBit/Sec bandwidth; and
- To provide service at a rate competitive with that charged for satellite service in order to retain users over time. This translates to a current monthly rate of \$60 or less per user.

### Funding Challenges

The projected annual revenues generated by 60 users paying \$50 per month for service is \$36,000. Since operating costs are projected to consume most or all of that revenue, there is not much left for capital costs. Even the most basic of wireless broadband networks could be difficult to finance with this level of revenue. However, the hope is that most if not all of the capital costs might be financed through either private or public grant funding. Assuming the capital costs can be covered through outside funding, the projected revenue would simply need to cover the recurring costs for leased services, Internet access, ISP services, network operations, equipment maintenance, and the cost to lease tower space for the antennas.

### Orick/Klamath DSL

In addition to the Orick project recent discussions have turned to the potential for an emerging CLEC with experience in other rural northern California communities to approach solving the Orick and Klamath challenges through a DSL approach. This project is very early in the discussion phase and depends on finding additional capacity in the Verizon microwave feed through the area as well as gaining access to the Verizon central offices or huts in the area for co-location of DSL enabling electronics.

### **Assessment Summary**

Del Norte and surrounding counties are examples of what has been termed “the rural challenge”.

The current major telecommunication landlord, Verizon, has to date not offered broadband services in Del Norte. This has in effect held the region back from participation in the 21st century economy. They are a publicly held shareholder-owned corporation. Apparently the county is not in their plans for offering broadband in the foreseeable future. Yet they are substantially compliant with the vast majority of FCC and California PUC requirements and they are growing wealth for their shareholders and management.

There is a growing awareness of the barrier to economic and quality of life growth presented through the lack of access to advanced telecommunications services (i.e., broadband). That growing awareness is fostering an environment conducive to asserting change into the region. There also is a growing understanding of the telecommunications industry and what it takes to foster the changes necessary to meet growing demands of the region.

There is a changing market environment in the region such that we can bring market opportunities to the attention of other providers and private sector investors. One needs look no farther than the recent Charter announcement for a remedy. While it took the better part of a couple of years of behind the scenes negotiations and encouragement, the result we expect by late 2007 is nothing less than removing the cork from the bottle that has been containing the genie of economic development hoped for by many in the north county.

Now we need to do the same for the south part of the county.

Additionally, we need to continue to drive the discussion on route redundancy to a new level of awareness. Collaboration with other regional players is required. This is underway and growing.

Education and workforce preparation is underway and deserves to be bolstered and supported by the community to meet increasing demands of the 21<sup>st</sup> century digital economy. This does include tourism and new ways to use technology.

The county has reached a point where it is using IT on a fairly regular basis with impacts on daily tasks. There is considerable opportunity to further expand the use of IT in the county, to integrate it more fully into daily operations and lives. Successful integration in the 21<sup>st</sup> century depends on ubiquitous broadband along with widespread knowledge of how to take full advantage of the resource. Thus the criticality of the role played by the workforce development agencies and education in providing 21<sup>st</sup> digital age education and continuous learning opportunities.

Over the course of meeting with county residents one thing became clear. There is a great deal of interest in addressing the future of the county. But another observation also can be noted. The energies are not focused as well as they could be. Here's another opportunity to provide focus and to use the power of modern Web-based technologies to provide ready communications between groups (e.g., blogs or other manifestations of the Web 2.0 upsurge).

## **Del Norte Teletransportation / Telecommunications Strategic Plan**

### **Mission Statement**

The CEDS adopted by the Commissioners includes the following vision statement:

“To develop a sustainable economic base by retaining, expanding and attracting new business by balancing the needs of both the business and residential communities while considering the effects of economic development on the environment of our unique Redwoods and coastal community.”

### **Vision Statement – 2010 and beyond**

Vision statements convey a picture of “what is to be”. What follows is one such picture of the future for Del Norte County residents.

Del Norte County: connected to the 21st century... *and the world knows it!*

Knowledgeable usage of IT and advanced telecommunication technologies spur economic development and enhance the quality of life of all county residents. Government, businesses, healthcare, not for profits and education all benefit from access to a reasonably priced, robust telecommunications infrastructure that provides maximum flexibility, growth and expandability.

The Del Norte County Information Technology Advisory Committee (ITAC) monitors and reports annually to the Commissioners on the status of telecommunication infrastructure and usage. The ITAC is composed of volunteers from a variety of sectors and interests in the county and serves as a liaison between countywide telecommunication stakeholders and service providers, and, through regular community forums, fosters an environment of open communication, cooperation and collaboration with the providers of communications services, ensuring that the area’s needs are being adequately communicated and serviced. On-going community forums throughout the county educate and promote the use of a variety of technologies. At these public meetings input received from attendees is compiled by the ITAC and shared at least annually with business, education, county and city government, and service providers.

Businesses thrive in Del Norte County due to our unique mix of traditional and technical occupations. Route redundant telecommunications infrastructure attracts high technology using firms to the area. Due to the availability and knowledge of how to use advanced telecommunications services even small businesses find it easy to compete in the global market. All businesses meet and exceed their goals for production and expansion. Family wage jobs, and even higher wage jobs, are plentiful. Residents’ income will be such that home ownership is readily attainable.

Residents go on line to obtain local, state and federal government services; they get building permits, pay traffic fines, access property information and pay their taxes. The list of services changes periodically because county and city governments, through surveys, on-line town meetings and other well-publicized programs, seek continuing feedback from the people who live here. Economic development partners jointly are responsible for the ongoing creation and maintenance of a well-published technology profile for the county. These groups actively seek funding through a series of grants and entrepreneurial activities. These funding sources ensure sustainable access to on-line

information in public areas; for example, in schools after hours, in public areas of Del Norte County communities.

Residents benefit from access to education from the state-of-the-art facilities in the county. All education facilities provide targeted 21<sup>st</sup> century digital economy workforce development programs. Development offices work closely with all segments of business, healthcare, not for profits and government to develop workforce goals and set priorities. Continuing interaction among education, businesses, not for profits, healthcare, government groups, and residents makes it easy to determine appropriate training programs and to establish a technically adept workforce. High schools, the community colleges, and education centers provide distance education (DE) opportunities from resources throughout California, the US, and the world. Through DE students of all ages acquire advanced training or degrees where they live and where they work. That workforce is the cornerstone of the county's economy as it includes the best and the brightest of the county's young people. Family members are re-united as they return to their home county to participate and benefit from the opportunities in our growing 21<sup>st</sup> century economy. They bring their families and skills back to the area because of the unsurpassed quality of life and opportunities for career advancement.

All of the county's healthcare service providers are online and participate as members of a community medical network. Telehealth services are available throughout the county; reaching into the most remote areas of the county, extending the reach of providers for consultations, diagnostics, and emergency services. Area providers tele-consult out of the area, bringing additional dollars into the economy. Patient education and monitoring is everywhere in the county, including in the home. Patients no longer have to drive long distances for pre-surgery education and can obtain quality information to assist them with management of their health. Through remote monitoring and patient interactions residents are afforded the opportunity to remain in their homes for longer periods of time as they age, saving tax payers significant dollars while providing a high quality of life for the residents and providing a new category of employment.

Representatives from the ITAC work with Curry and Humboldt counties as well as with area providers to develop regional awareness and approaches for advanced telecommunications services in region.

## **Goal 1 –Del Norte County's Telecommunication Infrastructure and Services Match 21<sup>st</sup> Century Demands**

### **Strategy**

***Encourage and support the continued growth of the Del Norte County telecommunications infrastructure so that employees can be as efficient as possible, healthcare providers can provide the highest levels of care for patients, businesses and all organizations can be competitive as they see fit in the global economy, and residents can have every access to education, information and services.***

### **Activity 1.1 Establish a Standing Information Technology Advisory Committee**

Continuity and sustainability of planning activities would be well served through the establishment of a standing Information Technology Advisory Committee (ITAC). The volunteer group would be populated by representation from both the urban and rural areas of the county as well as from the various sectors of our economy, including telecommunication providers. The

ITAC would be charged with implementing, upgrading and monitoring progress of the Strategic Plan.

The ITAC will meet at least quarterly to monitor and make recommendations on countywide telecommunication and technology activities, reporting to the TA EDA on at least an annual basis. Topics would include, but are not limited to:

- Route redundancy
- Broadband services and deployment
- Cellular phone service
- Telephone service and use of lifeline opportunities
- Use of technologies in support of a 21<sup>st</sup> Century Digital Economy
- Governmental Websites – “*online not in line*”

Tasks:

1.1.1 Recruit a standing advisory committee composed of 8 – 12 volunteers from throughout the county. Members are concerned with the full range of telecommunications services provisioning and usage. The committee chair will present its findings to the public and regional planning agencies on an annual basis.

- Elect an ITAC chair at the first meeting to serve for a one-year period.
- The chair will be responsible for managing the meetings, coordinating development of the annual report, conveying committee concerns and recommendations to the TA EDA.
- Meet at least quarterly.
- All meetings will be conducted in accordance with California’s Public meeting statutes.
- The ITAC chair would convey the annual report in a public meeting.
- At a minimum the report will address the status and plans for broadband, route redundancy, cellular phone and usage of telecommunications in the county.

When: Q3 2007 - Formation and organization of the volunteer committee.

Who: TA EDA

Activity 1.2 Support and Facilitate Availability of Broadband

Del Norte County has benefited from a recent private sector investment in advanced telecommunications technology in the region. Yet the rapidly escalating need for even more bandwidth due to emerging applications means our work is not done. This is especially true as one heads south of Crescent City.

Tasks:

1.2.1 Establish a broadband goal stating that 95% of all county residents who want it will have access to broadband services by 2010. This non-binding leadership statement from the TA EDA is a step toward quantifying the effort, puts in place a metric and sets a tone for continued investment and growth of the telecommunications infrastructure in the county.

The ITAC under the direction of the TA EDA will utilize this Strategic Plan as a beginning resource to direct, monitor and promote further expansion of broadband services to meet the goal. The ITAC will determine the course of action to be pursued based on a majority vote of the committee members. These efforts will include:

- Identification of projects that accelerate broadband in rural areas, especially outside of the Crescent City footprint.
- Seek use of broadband aggregation in areas not served
- Encourage public-private partnerships
- Identify funding sources
- Evaluation of tax credits or other incentives
- Promote provider competition
- Broadband usage education

When: On going with ITAC findings reported in the annual report to the TA EDA and to each of the broadband providers in the region. Targeted completion for the coverage goal is Q1, 2008.

Who: ITAC

1.2.2 Adopt county and municipal ordinances to coordinate and require placement of conduit whenever roads are dug up or new commercial or residential site development occurs. Access to that conduit by telecommunications companies who provide broadband will be encouraged and offered at very low or no cost to the telecommunications provider.

When: Targeted completion for the ordinances goal is Q1, 2008.

Who: Board of Supervisors and City Councils

### Activity 1.3 Support and Facilitate Availability of Quality Cellular Phone Service

Cellular phone reception is a critical for public safety and is conducive to supporting tourism and other businesses. Today there are a number of well-traveled areas, and less well-traveled areas, in the county where cellular phone service is unavailable.

#### Tasks:

1.3.1 Establish a cellular services goal of 100% coverage on the major travel corridors by 2010. These routes would include the highways 101 and 199 as well as other major travel corridors in the county. This non-binding leadership statement from the TA EDA is a step toward quantifying the effort, puts in place a metric and sets a tone for continued investment and growth of the cellular communications infrastructure in the county. This step is critical in support of tourism and public safety.

The ITAC under the direction of the TA EDA will utilize this Strategic Plan as a beginning resource to direct, monitor and promote further expansion of cellular services to meet the goal. Efforts will include:

- Documentation of areas of “dropped” coverage
- Monitor cell tower siting
- Encourage tower “stealthing”

- Collocation on existing structures, especially on state, county or municipal structures
- Fast track permitting for structures
- Promote use of shared facilities agreements among cellular providers to reduce antenna proliferation and increase coverage.

When: On going with ITAC findings reported in the annual report to the TA EDA and to each of the cellular providers in the region. Targeted completion for the coverage goal is Q2, 2009.

Who: ITAC

#### Activity 1.4 Support and Facilitate Regional Route Redundancy

Uninterrupted telecommunications through route redundancy (AKA: route diversity) is a critical requirement for 24 x 7 commercial activity, education, healthcare, access to government and public safety.

- Identify entities requiring route redundancy
- Aggregate demand and create partnerships
- Develop a detailed route redundancy engineering and business plan

#### Tasks:

1.4.1 Continue regional planning efforts to establish route redundancy. Work with regional public and private sector individuals and groups to identify routes, build partnerships, develop business plans and identify funding. Explore the alternatives highlighted in this Plan. This is a difficult and complex task that requires considerable persistence.

When: On going with ITAC findings reported in the annual report to the TA EDA and to each of the communications providers in the region. Targeted completion is Q2, 2009.

Who: ITAC

#### Activity 1.5 Support the efforts of the California Broadband Task Force and work with Curry County

Work with the regional members of the California Broadband Task Force to promote access to, adoption of and new applications for broadband networks and advanced communications. Coordinate and collaborate on efforts with Curry County.

#### Tasks:

1.5.1 Participate in efforts to establish a 4-county regional “Rural Broadband Partnership” pilot. The counties would be Del Norte, Humboldt, Trinity and Mendocino. The partnership would be composed of regional civic leadership, telecommunications providers, and representatives from business, education, healthcare and government. In addition ensure increased collaboration and cooperation with Curry County. Efforts would focus on:

- Streamlining policies (ordinances, permits, etc.)
- Aggregation of demand on a community-by-community basis
- Development of business/marketing models for each community and for the pilot region
- Actively marketing the results to private sector companies and/or investors

When: Q2, 2007 through Q2, 2008

Who: ITAC

### Activity 1.6 Establish a regional exchange point

The best way to both reduce costs and improve network service quality is to exchange local data traffic locally. Here we define “locally” as the region of Curry, Del Norte, Humboldt, Trinity and Mendocino counties. This activity assumes the establishment of regional route redundancy.

#### Tasks:

1.6.1 Work with regional providers to establish a carrier neutral exchange point. Connecting local traffic locally improves the quality of those transmissions by reducing the transmission delay time, reducing the number of dropped data packets and reducing the network jitter (variable arrival time of data packets). It also reduces the need for expensive bandwidth to send that traffic to a distant location, only to have it sent back to a nearby location. In telecommunications, as in other industries, improving quality usually decreases costs, making it a win-win proposition. This task can build off the route redundancy efforts.

When: Q1, 2009 through Q1, 2010.

Who: ITAC

### Activity 1.7 Identify funding to support continued planning efforts

Teletransportation / Telecommunication planning efforts are very complex, extremely time-consuming and of absolute criticality to Del Norte County. Planning and implementation activities for this topic may very well be among the highest priorities for economic development for the region. Substantial work has now occurred over the past year with significant efforts ahead. Many relationships have been built and substantial knowledge has been accrued, not all of which is possible to convey in the Phase Two report. Continuity and sustainability of these activities is crucial. Any loss of momentum will be a set back to continued progress.

Considerable additional work remains on these topics:

- Route redundancy – next level of detailed examination of routes
- Last Mile (“first mile”) provision of broadband, especially to areas south of Crescent City
- Competition – attracting other providers to the area
- Demand side development – education, workforce development, understanding how to fully exploit the capabilities of broadband.

Tasks:

1.7.1 Identify and lock in funding for these efforts for the next two years.

When: Q3, 2007

Who: TA EDA

**Goal 2 -- Del Norte County's Workforce Is 21st Century Ready**

**Strategy**

***Ensure that all Del Norte County workers have the opportunity to equip themselves with the necessary tools to succeed in their careers and in whatever field they choose in this new and dynamic global digital economy. Encourage entrepreneurship, provide for life-long learning and promote growth of existing businesses. Build on existing programs and relationships.***

**Activity 2.1 Ensure development of a 21<sup>st</sup> Century Digital Economy Prepared Workforce**

During the transition from the Old Economy to the 21<sup>st</sup> century digital economy (also referred to as the New Information Economy or the Knowledge Economy), the fate of specific industrial sectors and particular companies is uncertain. However, any status report on the American economy would reveal that there is an ever-growing need for a workforce that is skilled, knowledgeable, and adaptable to a rapidly changing global landscape. 21st century workforce preparation requires strong academics, thinking, reasoning, and teamwork skills, and proficiency in using technology.

Tasks:

2.1.1 Deliver a coordinated 21st Century Literacy Readiness campaign with outreach to all county youth -- develop (where none exist) and strengthen (where they do exist).

- Foster an understanding of the importance of increasing the acquisition of critical IT skills and knowledge needed to succeed in today's workplace.
- Include: classroom speakers, field/trips/business tours, career interest interviews, job shadows, mock employment interviews, mentors, career fairs/career days and other similar activities.
- Use public service announcements on radio and TV as well as Websites and print media.
- Promote use of "Select Careers" (<http://www.calmis.ca.gov/SelectCareers/>) as a tool to understand IT-related occupations

When: Commence Q2, 2008 and on going

Who: ITAC (as facilitator) in conjunction with k-12 educators, regional workforce development groups and regional businesses.

2.1.2 Promote and provide digital economy career pathway information and resources for adults and youth. A number of really good resources exist today (e.g., the SBDC resources <http://www.northcoastsbdc.org/pages/home.php>) but could benefit from even greater promotion and development.

When: On going

Who: ITAC with regional workforce development groups and K-12.

2.1.3 Promote expanded opportunities for continuous learning using online offerings (distance education), onsite delivery and use of videoconferencing.

When: Q4, 2007 and On going

Who: ITAC and partners

## Activity 2.2 Promote and Support Small Business Growth

Small businesses are the heart and soul of the Del Norte County economic engine.

### Tasks:

2.2.1 Widen the target population for entrepreneurship programs to attract the participation of women, the young and minorities. Coordinate efforts with the SBDC. Use public service announcements on radio and TV as well as Websites and print media. Explore funding opportunities through workforce initiative grants.

When: Q4, 2007 and On going

Who: ITAC and partners

2.2.2 Establish a freestanding Innovation and Entrepreneurship Institute.

- Increase opportunities for county residents to create their own jobs and businesses using broadband capabilities.
- Examine and report on the role the k-12 education system could play in developing innovation and entrepreneurial skills and attitudes
- Facilitate increased networking among firms in order to foster a culture of mutual cooperation and risk-taking.
- Maximize use of the Internet/Websites [note: excellent models for use of the web exist – e.g., [www.thebeehive.org](http://www.thebeehive.org)].

When: Q1, 2008 and on going

Who: ITAC and partners

2.2.3 Review and simplify registration procedures required to establish a business. Ensure that firms are able to open as quickly and painlessly as possible.

When: Q1, 2008 and on going

Who: ITAC and partners

## Activity 2.3 Develop Programs to Ensure Adequate Supply of Trades Workforce

Even as we look to add the absolutely critical dimensions of the 21<sup>st</sup> Century Digital Economy to our county and region, there will continue to be a large demand for qualified trades persons. No economy can exist without these qualified members of the workforce.

Tasks:

2.3.1 Expand online 24 x 7 course offerings in support of the trades and support a seamless transition for high school students to achieve associate degrees or certifications. The didactic portion of many work skills programs can be offered via online and distance education mechanisms. Work with the SBDC, k-12, community college and Humboldt State University to identify and evaluate expansion of online education and support for these areas of rapidly growing employment opportunities (partial listing):

- Advanced Electronics Technology (Avionics)
- Refrigeration & Major Appliance Service Technology
- Aircraft Mechanic
- Applied Service Management
- Auto Parts & Warehousing
- Building Construction Technician
- Building Maintenance and Management
- Carpentry
- Commercial Truck Driving
- Certified Automotive Technician
- Certified Truck & Diesel Technician
- Commercial and Residential Heating, Ventilation, & Air Conditioning (HVAC)
- Construction - Home Remodeling and Repair
- Electrician
- Electronic Systems Technician
- Locksmith Training
- Marine & Watercraft Mechanic
- Maritime Education
- Motorcycle Technician
- Plumbing Technology
- Small Engine Repair
- Transport Refrigeration & Air Conditioning

When: Q3, 2008 and on going

Who: ITAC, chambers of commerce, SBDC, Workforce and Job Councils, k-12 and higher education.

Activity 2.4 Evaluate the Potential for Community Development Resource Centers

A Community Development Resource Center is a community service, social action, and/or educational facility where computers, related communications technologies, education programs and business mentoring are available to people. Each CDRC has its own unique qualities, yet all share a commitment to using technology, promoting access to education and providing business development support with a belief that a CDRC can be a means for participants to increase their self-sufficiency. This could be especially critical for the more rural communities of the county.

Tasks:

2.4.1 Support the development of a full range of business incubator facilities from early initial concept to production and graduation. These include “incubation in place” wherein existing businesses are supported in creating new business lines. Incentives will include grants, low interest loans, relationships with research institutions and general business services.

When: Q1, 2008 and on going

Who: ITAC and partners

### **Goal 3 -- Del Norte County Is A Full Participant in the 21<sup>st</sup> Century Economy *and the World Knows It!***

#### **Strategy**

***A knowledge-based digital economy will be a significant component of the 21st century economy and serve as an added dimension for promoting economic opportunities in Del Norte County.***

#### **Activity 3.1 Promote Del Norte County's Telecommunication Assets**

We need to let the world know about the county's digital readiness, including broadband capacities. Actively engage in a public awareness campaign to tout the variety and depth of telecommunications service available in the county.

#### **Tasks:**

##### **3.1.1 Develop a Del Norte digital communities marketing campaign to promote Del Norte County as a place to do business in the 21<sup>st</sup> Century.**

- Create promotional materials touting the county's array of telecommunications capabilities and 21<sup>st</sup> century preparedness for inclusion in marketing campaigns, presentation on Web sites, etc.
- Explore use of volunteer copywriters, students, etc.
- Explore opportunities in existing budgets and/or seek economic development related grants.
- Create a one-stop promotional Web site for the county that includes original content as well as links to other existing online resources in the county. Included here would be current statistics profiling the county.

**When:** Q2, 2008 and on going

**Who:** TA EDA in conjunction with the ITAC and its partners

#### **Activity 3.2 Include 21<sup>st</sup> Century Factors In Economic Development Policy**

Globalization of markets for goods, services, capital, and labor accelerated in the 1990s and proved to be the undoing of both industrial recruiting and cost cutting. Regions were forced to move away from old industries and to search for new market opportunities, thereby ushering in our current era of global competitiveness. This represents a fundamental change from previous eras. This shift requires a workforce with 21<sup>st</sup> century knowledge-based digital skills and the opportunity for continuous learning to keep pace with the demand rapidly evolving skill sets. Del Norte County not only needs to focus on what happens at home but must also understand and prepare for its role in the global economy.

#### **Tasks:**

##### **3.2.1 Integrate 21<sup>st</sup> century economic development policies into existing approaches. Such policies need to foster continual increased diversification of our economy and need to go**

beyond attracting and fostering light manufacturing, an area of significant risk for outsourcing today and in the foreseeable future, and tourism.

When: Q1, 2008 and ongoing

Who: TA EDA in conjunction with the ITAC and its partners

### Activity 3.3 Continue the Regional Approach to Economic Development

While each community in the region has unique challenges and opportunities, industries, transportation, land uses, natural resources, and other key elements of a healthy economy are regional in scope. Communities and the private sector need to cooperate to create regional wealth in a manner that promotes a coherent collaboration, respecting local character and identity.

#### Tasks:

3.3.1 Support and promote regional economic development activities. Work closely with Curry County in Oregon and Humboldt County in California. Add increased awareness of the need to further diversify the economy by adding increased knowledge-based businesses to ensure our participation in the global knowledge-based digital economy.

When: Q3, 2007 and ongoing

Who: TA EDA in conjunction with the ITAC and its partners

### Activity 3.4 Develop an “Independent Living” Pilot Project

New technology solutions offer great promise to improve quality of care while reducing healthcare costs. It is time now for technology to transform the experience of aging as well as improving the lives of those persons with disabilities. This project would bring together builders, information technology workers, healthcare providers and other components required to produce the pilot project. The potential exists to improve the quality of lives, to save taxpayers money, and to create new opportunities for employment for seniors and persons with disabilities. It’s also a great way to demonstrate our county’s capabilities, both in telecommunications infrastructure and our ability to collaborate.

#### Tasks:

3.4.1 Develop a Project Independence pilot project. A countywide task force will plan for meeting the housing and home healthcare needs of low-income seniors and people with disabilities by first developing a pilot project. This is a separate group from the ITAC, but possibly with some overlapping membership. The group would have representatives from a variety of sectors -- seniors and persons with disabilities, architects, contractors, healthcare, financial services, housing administration and other parties required for such a collaborative effort.

- Review currently available technologies and identify infrastructure deficits that act as barriers to effective technology integration into housing for seniors and people with disabilities. Includes a review of available technology for enhancement of affordable housing and supports.
- Conduct a Needs and Awareness Survey to provide a picture of assistive technology awareness, experience, and barriers to use among seniors and

- people with disabilities. This information will help shape training activities, demonstration projects, and recommendations for systems change.
- Determine the extent to which current policies address assistive technology.
  - Identify key policies that may be modified to effectively expand the integration of assistive technology.
  - Develop a plan to promote and provide assistive technologies.
  - Oversee implementation of recommended infrastructure improvements and demonstration projects, and develop information resources and training materials for consumers, housing developers, case managers, families, contractors and others.

When: Commence by Q1, 2008 with targeted completion of a pilot project by Q1, 2009.

Who: An alliance of concerned parties – ITAC, Sutter, Seniors and Disabled Services, and others as yet to be named (for example, local construction entities).

### Activity 3.5 Promote Increased Telework / Telecommuting Opportunities

Promote use of telecommunications as a means to reduce transportation impacts, which can improve air quality, personal convenience and reduce dependency on non-renewable resources. Many of these jobs will come from out of the area.

#### Tasks:

3.5.1 Promote telecommuting to businesses and institutions in and out of the county as a way to add employment opportunities, save our air, fuel and commute time. Possibilities include educational seminars on how to do it, PSAs on radio and TV, etc. Successful implementation will bring additional dollars into the economy.

When: Q1, 2008 and on going

Who: ITAC and partners

### Activity 3.6 Promote expanded use of telehealth/telemedicine technologies

Telehealth is “the practice of healthcare delivery using telecommunications technology including but not limited to diagnosis, consultation, treatment, transfer of medical data, education, dissemination of public health alerts and/or emergency updates”. Telemedicine is “the use of telecommunications technology to deliver clinical diagnosis, services and patient consultation”.

Telehealth technologies enable home health providers to redefine patient treatment plans, as they are able to increase patient visits due to elimination of a significant percentage of travel to patients' homes. Rural patients can now have access to specialists.

Spending on health care is an especially significant portion of any economy, especially rural economies. The more of those dollars that can be kept locally the better off the local economy will be.

#### Tasks

3.6.1 Work with local providers to encourage and support expanded use of telehealth technologies. Communities can support acquisition of funds (grants and other sources)

and provide other support (i.e., promotion). Availability of these modern services is a value-add for economic development activities. Here there's also an opportunity to become a service provider to others by encouraging specialist to move to the area to operate consultation services outside the area.

When: Q1, 2008 and on going

Who: ITAC and partners, especially regional hospitals and clinics

### **Concluding Remarks**

Researching and developing this set of recommendations was a great opportunity to discover the positive attributes of Del Norte County, especially its growing telecommunications infrastructure and service offerings. It was exciting to see the Charter announcement and to project the impact from this greatly expanded broadband capacity.

Even more exciting is the obvious energy and dynamism of a number of the residents and their sincere interest in moving Del Norte County into the 21<sup>st</sup> century. Probably one of the most remarkable findings is the degree to which the residents are willing to pitch in and work together.

Achieving the goals identified in this Teletransportation / Telecommunications Strategic Plan will result in positive impacts to the economic climate and will also positively impact the quality of life for residents. It presents another dimension of working together and it, too, would benefit from a more integrated/coordinated economic development planning approach. There is an almost dizzying array of economic planning activities under way with a number of groups. With a modest amount of coordination this energy could be more effectively channeled. One example would be a clear identification of a single point of contact for economic development activities.

We may not be able to predict the future but we sure can prepare for it. It's also been said "The future is up to us, let's go out and invent it!"

**Appendix 1 - Del Norte Teletransportation Strategic Plan Gantt Chart**

		2007		2008				2009				2010			
	Resource	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Goal 1 – Del Norte County’s Telecommunication Infrastructure and Services Match 21<sup>st</sup> Century Demands</b>															
Activity 1.1 Establish a Standing Information Technology Advisory Committee															
Task 1.1.1 Recruit a standing advisory committee															
	TA EDA														
Activity 1.2 Support and Facilitate Availability of Broadband															
Task 1.2.1 Establish a broadband goal															
	ITAC														
Task 1.2.2 Adopt county and municipal ordinances															
	County & cities														
Activity 1.3 Support and Facilitate Availability of Quality Cellular Phone Service															
Task 1.2.1 Establish a cellular services goal															
Activity 1.4 Support and Facilitate Regional Route Redundancy															
Task 1.4.1 Continue regional planning efforts to establish route redundancy															
	ITAC														
Activity 1.5 Advance the efforts of the California Broadband Task Force and work with Curry County															
Task 1.5.1 Participate in 4-county regional “Rural Broadband Partnership” pilot															
	ITAC														
Activity 1.6 Establish a regional exchange point															
Task 1.6.1 Work with regional providers to establish a carrier neutral exchange point															
Activity 1.7 Identify funding to support continued planning efforts															
Task 1.7.1 Identify and lock in funding for these efforts for the next two years															

		2007		2008				2009				2010			
	Resource	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Goal 2 – Del Norte County’s Workforce Is 21<sup>st</sup> Century Ready</b>															
Activity 2.1 Ensure development of a 21 <sup>st</sup> Century Digital Economy Prepared Workforce															
Task 2.1.1 Deliver a coordinated 21 <sup>st</sup> Century Literacy Readiness campaign	ITAC +														
Task 2.1.2 Promote and provide digital economy career pathway information and resources	ITAC +														
Task 2.1.3 Promote expanded opportunities for continuous learning using online offerings	ITAC +														
Activity 2.2 Promote and Support Small Business Growth															
Task 2.2.1 Widen the target population for entrepreneurship programs	ITAC +														
Task 2.2.2 Establish a freestanding Innovation and Entrepreneurship Institute	ITAC +														
Task 2.2.3 Review and simplify registration procedures required to create a broadband-based business	ITAC +														
Activity 2.3 Develop Programs to Ensure Adequate Supply of Trades Workforce															
Task 2.3.1 Expand online 24 x 7 course offerings in support of the trades	ITAC +														
Activity 2.4 Evaluate the Potential for Community Development Resource Centers															
Task 2.4.1 Support the development of a full range of business incubator facilities	ITAC +														

		2007		2008				2009				2010			
	Resource	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Goal 3 -- Del Norte County Is A Full Participant in the 21<sup>st</sup> Century Economy and the World Knows It!</b>															
Activity 3.1 Promote Del Norte County's Telecommunication Assets															
Task 3.1.1 Develop a Del Norte digital communities marketing campaign	TA EDA, ITAC +														
Activity 3.2 Include 21 <sup>st</sup> Century Factors In Economic Development Policy															
Task 3.2.1 Integrate 21st century economic development policies into existing approaches	TA EDA, ITAC +														
Activity 3.3 Continue the Regional Approach to Economic Development															
Task 3.3.1 Support and promote regional economic development activities	TA EDA, ITAC +														
Activity 3.4 Develop an "Independent Living" Pilot Project															
Task 3.4.1 Develop a Project Independence pilot project	ITAC +														
Activity 3.5 Promote Increased Telework/Telecommuting Opportunities															
Task 3.5.1 Promote telecommuting to businesses and institutions in and out of the county	ITAC +														
Activity 3.6 Promote expanded use of telehealth/telemedicine technologies															
Task 3.6.1 Encourage and support expanded use of telehealth technologies	ITAC +														

## Appendix 2 - "BEARFACTS" 1994 vs. 2004<sup>21</sup>

### BEARFACTS 1994

#### Del Norte, California (06015)

Del Norte is one of 58 counties in California. It is part of the Crescent City, CA Micropolitan SA. Its 1994 population of 28,105 ranked 48th in the state.

#### PER CAPITA PERSONAL INCOME

In 1994 Del Norte had a per capita personal income (PCPI) of \$14,037. This PCPI ranked 58th in the state and was 60 percent of the state average, \$23,203, and 63 percent of the national average, \$22,172. The 1994 PCPI reflected an increase of 0.9 percent from 1993. The 1993-1994 state change was 2.5 percent and the national change was 3.9 percent. In 1984 the PCPI of Del Norte was \$10,317 and ranked 56th in the state. The 1984-1994 average annual growth rate of PCPI was 3.1 percent. The average annual growth rate for the state was 3.8 percent and for the nation was 4.8 percent.

#### TOTAL PERSONAL INCOME

In 1994 Del Norte had a total personal income (TPI) of \$394,512. This TPI ranked 50th in the state and accounted for 0.1 percent of the state total. In 1984 the TPI of Del Norte was \$190,918 and ranked 52nd in the state. The 1994 TPI reflected an increase of 1.5 percent from 1993. The 1993-1994 state change was 3.2 percent and the national change was 5.2 percent. The 1984-1994 average annual growth rate of TPI was 7.5 percent. The average annual growth rate for the state was 5.9 percent and for the nation was 5.9 percent.

#### COMPONENTS OF TOTAL PERSONAL INCOME

Total personal income includes net earnings by place of residence; dividends, interest, and rent; and personal current transfer receipts received by the residents of Del Norte. In 1994 net earnings accounted for 55.7 percent of TPI (compared with 53.4 in 1984); dividends, interest, and rent were 17.9 percent (compared with 22.5 in 1984); and personal current transfer receipts were 26.5 percent (compared with 24.2 in 1984). From 1993 to 1994 net earnings increased 2.3 percent; dividends, interest, and rent increased 1.6 percent; and personal current transfer receipts decreased 0.2 percent. From 1984 to 1994 net earnings increased on average 8.0 percent each year; dividends, interest, and rent increased on average 5.1 percent; and personal current transfer receipts increased on average 8.5 percent.

#### EARNINGS BY PLACE OF WORK

Earnings of persons employed in Del Norte increased from \$253,600 in 1993 to \$258,687 in 1994, an increase of 2.0 percent. The 1993-1994 state change was 2.4 percent and the national change was 4.9 percent. The average annual growth rate from the 1984 estimate of \$113,613 to the 1994 estimate was 8.6 percent. The average annual growth rate for the state was 5.8 percent and for the nation was 6.0 percent.

*Note:* All income estimates with the exception of PCPI are in thousands of dollars, not adjusted for inflation.

## **BEARFACTS 2004**

### **Del Norte, California** (06015)

Del Norte is one of 58 counties in California. It is part of the Crescent City, CA Micropolitan SA. Its 2004 population of 28,327 ranked 48th in the state.

### **PER CAPITA PERSONAL INCOME**

In 2004 Del Norte had a per capita personal income (PCPI) of \$20,534. This PCPI ranked 57th in the state and was 58 percent of the state average, \$35,219, and 62 percent of the national average, \$33,050. The 2004 PCPI reflected an increase of 7.7 percent from 2003. The 2003-2004 state change was 5.4 percent and the national change was 5.0 percent. In 1994 the PCPI of Del Norte was \$14,037 and ranked 58th in the state. The 1994-2004 average annual growth rate of PCPI was 3.9 percent. The average annual growth rate for the state was 4.3 percent and for the nation was 4.1 percent.

### **TOTAL PERSONAL INCOME**

In 2004 Del Norte had a total personal income (TPI) of \$581,657. This TPI ranked 50th in the state and accounted for 0.0 percent of the state total. In 1994 the TPI of Del Norte was \$394,512 and ranked 50th in the state. The 2004 TPI reflected an increase of 9.4 percent from 2003. The 2003-2004 state change was 6.6 percent and the national change was 6.0 percent. The 1994-2004 average annual growth rate of TPI was 4.0 percent. The average annual growth rate for the state was 5.6 percent and for the nation was 5.2 percent.

### **COMPONENTS OF TOTAL PERSONAL INCOME**

Total personal income includes net earnings by place of residence; dividends, interest, and rent; and personal current transfer receipts received by the residents of Del Norte. In 2004 net earnings accounted for 53.8 percent of TPI (compared with 55.7 in 1994); dividends, interest, and rent were 14.8 percent (compared with 17.9 in 1994); and personal current transfer receipts were 31.4 percent (compared with 26.5 in 1994). From 2003 to 2004 net earnings increased 11.4 percent; dividends, interest, and rent increased 5.8 percent; and personal current transfer receipts increased 7.8 percent. From 1994 to 2004 net earnings increased on average 3.6 percent each year; dividends, interest, and rent increased on average 2.0 percent; and personal current transfer receipts increased on average 5.8 percent.

### **EARNINGS BY PLACE OF WORK**

Earnings of persons employed in Del Norte increased from \$321,985 in 2003 to \$359,249 in 2004, an increase of 11.6 percent. The 2003-2004 state change was 7.3 percent and the national change was 6.3 percent. The average annual growth rate from the 1994 estimate of \$258,687 to the 2004 estimate was 3.3 percent. The average annual growth rate for the state was 6.1 percent and for the nation was 5.5 percent.

*Note:* All income estimates with the exception of PCPI are in thousands of dollars, not adjusted for inflation.

## Appendix 3 – Impacts of Broadband

### Jobs, jobs, jobs!<sup>22</sup>

The introduction of broadband technologies has enabled traditional and new forms of communication to become a reality throughout the world. One fact that cuts across every region is that broadband technologies enable many applications that provide enormous benefits to citizens, most especially as jobs.

Broadband is an accelerator of economic development. This is because there are significant economic benefits to using broadband technologies for many applications. With broadband access, worker productivity increases, jobs are created, and wages grow. Broadband creates opportunities for bundling services together and enables operators to offer more services to consumers at lower prices, creating added efficiencies in both time and money. In addition, new or offshoot industries are created as a result of broadband. As broadband penetration rates grow, there will be a resulting demand for computer and home networking equipment, as well as wireless handheld devices and other equipment that facilitates broadband use.

The economic benefits of broadband arise from both direct and indirect sources. The economic benefits of broadband can also be attributed to indirect factors, including:

- Increased e-commerce
- Reductions in commuting
- Increased consumption of entertainment
- Internet telephony (VoIP)
- Savings in healthcare as a result of sophisticated telemedicine.
- For the entertainment sector, the economic benefits result from efficiencies in the distribution of goods, services, and information.

The ability to telework -- to work either from home or another location, such as a telecenter outside a person's regular office -- is a very significant broadband application. Teleworking can contribute to time and cost savings for both employees and employers as well as to enable persons with disabilities to work. While teleworking is generally thought to be "working from home," it is not limited to this. It also refers to using virtual or satellite offices to work. In a virtual office, employees may share a reduced office space at a nearby employer facility, use the same offices on a rotating basis, or participate in a fee-based telework center arrangement.<sup>23</sup>

Many community banks already offer online banking to help meet the ever-evolving needs of bank customers. Some banks see high-speed access as a way to expand those services. Broadband connectivity allows banks to offer everything from talking ATMs and digital check processing to two-way video interactions with bank personnel. The result is more competitive banks and efficient anytime/anywhere banking.

High-speed connections are as vital to today's transportation companies as railroad tracks, highways, and airports. Broadband-enabled devices help fleet managers monitor the routes of long-haul trailers, track cargo, and protect against security threats at ports, airports, and warehouses. Wireless broadband connections keep truckers in touch with loved ones while on the road, and help incident commanders provide emergency responders with critical data in the event of a transportation emergency.

## Our children, their futures<sup>24</sup>

Based on the data collected over the past decade, there is no doubt that more children of all incomes and backgrounds are using computers and the Internet than ever before. But it is also clear that some groups of young people -- primarily rural, low income and minority youth -- have poorer access to technology than others.

Since it was coined in the mid-1990s, the term “digital divide” has mostly been used to describe the gap between those who have “ever” and those who have “never” used a computer or the Internet. But as technology and its role in our society evolve, the concept of what constitutes access is evolving, too. Some updates to the definitions are needed, as suggested below:

- *Basic access*: the ability to get to a wired computer somewhere, at some time.
- *Quality of access*: some homes have high-speed of access and some homes have high-speed connections that make it easy to view graphics and download documents, while others have much slower “dial-up” connections; and some schools have wired computers in each classroom, while others have only a few for the whole student body to share.
- *Technological literacy*: the degree to which people know what they are doing online, how many applications they know how to use, and how easily they can learn new ones.
- *Access to useful content*: the information and software they need the information and software they need to do their schoolwork, protect their health, or find a job.

Put these together and the resulting definition of access is much more meaningful but clearly not as easy to turn into a sound bite, as whether a child has ever used the Internet.

With wired computers in most schools and libraries and rising home connection rates, almost all children have at least the possibility of basic access. Yet many advocates argue that ongoing inequities in *meaningful* access have real implications for children’s educational and economic opportunities. These inequities are reflected in the use of terms such as “digital opportunity” and “digital inequality” as alternatives to “digital divide.”

Whatever they call the current digital divide, policy experts and advocates generally agree that increasing technology access for underserved children is a worthy policy goal. They also see a natural evolution from policies focused on major infrastructure investments, such as wiring the nation’s schools and libraries, towards integrating online access into other policy objectives. Instead of technology goals, there are goals to help children learn, develop, and succeed in the workforce with the help of technology. Where policy and political differences arise is over how to define the significance of the current divide, and what role the government should play in narrowing it.

A great deal of progress has been made in closing the digital divide. Most children from all major income groups and ethnicities have gone online, but significant gaps in both the quantity and quality of access remain: where their access is located, the speed of their connection, and the skills they are taught for making the most of their online experience. These gaps could have real implications for children. Will all young people be prepared to participate in an increasingly digital economy and culture? Or will those who are already at risk be left farther behind as those

with high-quality access -- from better computers at school to high-speed connections at home -- move ahead?

What role can or should government play in closing today's digital divide? The remaining gaps in technology access may well be the most challenging to bridge. They are both less visible and more complex than the gaps we have already closed. As the first generation to grow up with the Internet starts to enter the larger world, we will undoubtedly learn more about the effects of the digital divide and see new directions for public policy.

In the meantime, there appears to be enough information about today's divide, in all its aspects, to inform a county, state and national debate about the educational importance of children's access to technology, what meaningful access looks like, and how much private and public investment is enough. While it may require new language and new approaches, this could be a very fruitful time for policymakers, industry leaders, and advocates to refocus on the digital divide, especially as it relates to the future of our state, our children.

## **Healthcare**

Broadband technologies can eliminate the distance barrier for rural patients by providing access to out-of-area physicians and health care resources. High-speed links let doctors deliver medical care more quickly and efficiently. Broadband-enabled medical devices are currently being used to improve the quality of life for all Americans.

The costs of health care impose an enormous burden on the economy. The latest projections from the Centers for Medicare & Medicaid Services show that annual health-care expenditures are expected to reach \$3.1 trillion by 2012, growing at an average annual rate of 7.3% during the forecast period or 17.7% of gross domestic product, up from 14.1% today. Telehealth will become a multi-billion dollar industry. But just what are the benefits of telemedicine? A recent white paper by the Telehealth Association of Oregon (TAO) examined this from three perspectives.<sup>25</sup>

### Economic Development and Quality of Life Perspective:

- Advancements in delivery of services
- Keeps dollars in the local economy
- Aids business recruitment and retention
- Workforce development / jobs
- Quality of life and longevity gains are worth a lot
- Clinical trials -- expands opportunity for participation

### Patient's Perspective:

- Access to healthcare
- Saves time, travel, and other expenses
- Healthcare at home
- Health provider integration
- Increased comfort-level with the technology

## Provider's Perspective:

- Emergency Room “front line” support
- Accuracy of diagnosis / reduction of medical errors
- A multifold increase in efficiency
- Continuing Medical Education / Lifelong learning

Telehealth, if used to its full extent, has the potential to cause great and far-reaching effects on the field of medicine. That is why it is important to take a look at the possibilities and limitations now. In that way we prepare to make the most of the technology available to us in the 21st Century.

*Will broadband Internet services be available to all Del Norte County residents?* Within the answer to this question lies the answer to whether telehealth is going to be a beneficial product of the technological age for our county's residents. The advent of telehealth brings some very useful technology to the medical community of the region and the rest of the U.S.. Yet many challenges remain ahead. Everything about the suggested programs for telehealth also depends on the hurdle of availability.

## **Access to government<sup>26</sup>**

The big idea here is “e-the-people.” E-government links people not just to each other and the e-commerce marketplace but also to the public marketplace of ideas, debate, priorities, initiatives, innovation, services, transactions, and results. It has the potential to put ownership of government truly in the hands of all Del Norte County residents.

Imagine government truly of, by, and for the people -- where individuals and organizations no longer wait in line between eight and five on weekdays only, but where they can be online at any time or place they wish. A place not only to get information but also to complete transactions with government, get services, talk with elected representatives -- even to vote; a government that organizes and furnishes information and services around the needs of people while protecting their privacy.

Imagine people in government who are excited about using the Internet to make a difference and produce results, answering questions instantly, using secure networks that cross organizational boundaries to serve the public. Imagine people in business enjoying fast and easy interactions with government that produce results in the public interest.

Imagine people in all sectors -- government, business, non-profits, and the research community -- working together to make this happen quickly, creatively, and cost effectively. This is e-government -- *our* government of the future, not *the* government of the past.

But don't stop there. E-government is not just about speed, efficiency, or accessing information online. Individuals according to their preferences and needs can also tailor it. Imagine individual Americans creating customized, one-stop sites for themselves online, where they can choose to get information, conduct transactions, or communicate with their elected representatives. Imagine having your own self-designed, interactive site where you can directly conduct all your business with government whenever you wish. You can pay taxes, check your Social Security earnings, find out whether your building permit has been granted, renew your driver's license

after your site has reminded you without being asked that it is coming due. You can also participate in public hearings, create communities of interest with others online, monitor voting records, and express your views to your representatives. In short, you can choose how and when to connect with government, with the ability to choose appropriate levels of privacy and security.

Here we do not advocate substituting electronic for personal communications between people and public servants. Rather, we envision more strategic and satisfying personal communications of higher quality, supported by electronic information, sources, transactions, and interactions.

### **Public safety<sup>27</sup>**

Law enforcement, fire departments, emergency medical technicians, ambulances, emergency rooms, public health departments and even schools are among the entities that are driving toward a more seamless interoperability in their communications. A mixture of broadband communication modalities may be used for a variety of innovative applications, including the delivery of real time video from inside burning buildings, floor plans to police officers entering a hostile environment, and even videos from robots entering a collapsed mineshaft.

Disaster relief and being committed to the relief of suffering people in situations of complex humanitarian emergencies and natural disasters is an enormous task. Not only does this involve technical equipment but also human engagement and methods of communication are important factors to guarantee the safety of people and nature.

A growing demand for mobile broadband services within telemedicine, fire fighting, mobile robotics and law enforcement operations are emerging rapidly. Remote patient monitoring is one of the key aspects of crisis and disaster management. It is crucial to the effectiveness of frontline medical assistance to injured citizens. The concept of remote patient monitoring is the subject of intense study in both the civil and military peacekeeping sectors where the need for a reliable, secure and very high capacity mobile technology has been identified in order to address activities on the scene of incidence.

Capabilities, involving either an ad hoc or day-to-day operational environment, include:

- Wireless mission-critical broadband data
- Secure and interoperable communication capabilities
- Multiple users with multiple applications
- Self-establishing and -healing network nodes (i.e., route diversity)
- IP-based mobile networking
- Robust management and control systems
- Flexible existing infrastructure dependence
- Dynamic and flexible radio configuration
- Real-time digital voice, video and sensing
- Video, still photos, complex graphics and drawings files
- Enhanced bio-telemetry information

## **Not for profits**

Foundations and their grantees, no longer solely are at the mercy of the mass media for coverage, have an important new platform of their own from which to express views, exchange ideas, publicize their work, and continue to do what they do best -- touching the lives of millions.

Nowadays, most people expect that all organizations -- including nonprofits -- will be able to connect to the Internet. Internet connectivity allows organizations to perform a wide variety of mission critical tasks:

- Use e-mail to inform and raise funds
- Conduct research on the web
- Post information to the web
- Create and maintain a Website
- Use web-based software applications.

The question for nonprofit organizations is no longer whether they should have Internet connectivity, but rather what type of connection, and who is the best provider.

Not unlike other sectors non-profit organizations are increasingly taking advantage of video conferencing, distribution of educational videos, Internet telephony (i.e. Voice over Internet Protocol – VoIP), and other large demand bandwidth applications.

## **Recreation**

Many people have used broadband to:

- Further personal hobbies
- Browse the Internet for fun
- Play games
- Gamble
- Download music, videos and movies.

In addition, position location technology, combined with broadband, can allow people to obtain restaurant information, local maps, and museum and tourist information. Broadband will increasingly be used to download on-demand movies and other entertainment content.

Entertainment is one of the fastest growing uses of the Internet, demanding more and more bandwidth for its applications. It is also a large contributor to our economy.

## **Rural communities**

Rural residents need telecommunications as a substitute for transportation even more than urban folks. Telehealth, distance learning, e-government, and e-commerce are more important to rural communities than to urban communities because they have lower population densities, greater travel distances and fewer local services. Most urban folks do not realize how much “drive time” is required to conduct business and government in rural Oregon. Broadband infrastructure suitable for telecommuting, including from rural California to government offices in Sacramento

and to local government offices, can make a significant difference to the economy and the quality of life in rural communities.

## Endnotes

We've attempted to provide complete attribution for use of the intellectual property of others. Our apologies are offered to any we've missed.

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<sup>1</sup> "Measuring Broadband's Economic Impact," William H. Lehr, Carlos A. Osorio, Sharon E. Gillett, Massachusetts Institute of Technology, Marvin A. Sirbu, Carnegie Mellon University, Presented at the 33<sup>rd</sup> Research Conference on Communication, Information, and Internet Policy (TPRC, September 23-25, 2005, Arlington, VA, Revised as of January 17, 2006, [http://cfp.mit.edu/groups/broadband/docs/2005/MeasuringBB\\_EconImpact.pdf](http://cfp.mit.edu/groups/broadband/docs/2005/MeasuringBB_EconImpact.pdf), page 23, retrieved January 20, 2006

<sup>2</sup> Ibid, "Measuring Broadband's Impact," In this section we share a number of quotes and thoughts from "Measuring Broadband's Economic Impact"

<sup>3</sup> Ibid, "Measuring Broadband's Impact," page 2

<sup>4</sup> Ibid, "Measuring Broadband's Impact," page 5

<sup>5</sup> Ibid, "Measuring Broadband's Impact," page 5

<sup>6</sup> Ibid, "Measuring Broadband's Impact," page 5

<sup>7</sup> Ibid, "Measuring Broadband's Impact," page 18

<sup>8</sup> Ibid, "Measuring Broadband's Impact," page 23

<sup>9</sup> "Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution", Robert D. Atkinson & Andrew S. McKay, [http://www.itif.org/files/digital\\_prosperity.pdf](http://www.itif.org/files/digital_prosperity.pdf), March 2007, retrieved March 8, 2007

<sup>10</sup> Del Norte County's Comprehensive Economic Development Strategy (CEDS), 2006 - 2008, adopted May 2006 by County Board of Supervisors

<sup>11</sup> California Labor Market Information System, <http://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSResults.asp?selectedarea=Del+Norte+County&selectedindex=8&menuChoice=localAreaPro&state=true&geogArea=0604000015&countyName=>

<sup>12</sup> Bureau of Economic Analysis, local area personal income, <http://www.bea.gov/region/reis/>, retrieved March, 2007

<sup>13</sup> *ibid*, Bureau of Economic Analysis

<sup>14</sup> *ibid*, Bureau of Economic Analysis

<sup>15</sup> *ibid*, California Labor Market Information System

<sup>16</sup> *ibid*, California Labor Market Information System

<sup>17</sup> *ibid*, California Labor Market Information System

<sup>18</sup> *ibid*, California Labor Market Information System

<sup>19</sup> "Living in a Networked World", Tina Nemat, 2004

<sup>20</sup> "Orick Net: Orick Wireless Broadband Business Plan", PlanWest Partners, Inc., Sparling and NeraTech, January 16, 2007

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- <sup>21</sup> Bureau of Economic Analysis, <http://www.bea.gov/ea/regional/bearfacts/action.cfm?fips=06015&areatype=06015&yearin=2004>, retrieved March 2007
- <sup>22</sup> “Why Broadband Matters,” Report of the Oregon Telecommunications Coordinating Council, presented November 16, 2004 to the Oregon Joint Legislative Committee on Information Management and Technology, John Irwin, Chair, ORTCC, pages 5 - 12
- <sup>23</sup> “The Economic and Social Benefits of Broadband Deployment,” <http://www.tiaonline.org/policy/broadband/Broadbandpaperoct03.pdf>, Telecommunications Industry Association, October 2003, page 6
- <sup>24</sup> “Children, The Digital Divide, And Federal Policy,” <http://www.kff.org/entmedia/7090.cfm>, The Kaiser Family Foundation, September 16, 2004
- <sup>25</sup> “Benefits of Telemedicine,” <http://www.ortcc.org/reports/>, white paper for the Telehealth Association of Oregon, John Irwin, et al, January 16, 2004
- <sup>26</sup> “E-government - The Next American Revolution,” [www.excelgov.org](http://www.excelgov.org), The Council for Excellence in Government, December, 2002
- <sup>27</sup> Project MESA, <http://www.projectmesa.org/>