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11225 SENATE LABOR & COMMERCE

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Executive Summary

The purpose of this report is to provide the State of Alaska with a set of recommendations, based on best practices nationwide, for a statewide framework that promotes a cost effective delivery of telecommunications services throughout Alaska.

The report's recommendations addresses the following six policy goals for telecommunications services for both urban and rural residents:

1. Universal service of both basic and advanced services.
2. Appropriate level of government involvement to ensure competitive neutrality and consistent service.
3. Appropriate levels of regulation to encourage industry.
4. Innovative and cost effective deployment of publicly available advanced telecommunications infrastructure.
5. Consistent actions across State government to promote universal service, infrastructure development, competitive neutrality, and appropriate regulation.
6. Implementation of the Telecommunications Act of 1996 in Alaska in a manner that addresses the State's unique characteristics.

Nationally, the telecommunications industry is in a state of disarray. Recent events over the past two years have left the industry with a gloomy outlook, as forecasts continue to be scaled back. Alaska has been somewhat isolated from these events, as the impact of telecommunications company bankruptcies appear likely to have only a small impact on local providers.

Competition in the urban areas of the state – Anchorage, Fairbanks and Juneau – is brisk. In Anchorage, for example, there are several wireless telephone services, and the State's largest CLEC has a 40% share of the local telephone service market.

In the rural areas of Alaska, telephone penetration increased substantially in the 1970s and 1980s. However, competition is less prevalent, and in order to address this, some communities are implementing innovative and cooperative solutions in order to establish infrastructure for advanced services.

Advanced services such as broadband and the Internet are of critical importance to Alaska, because of the extreme distances separating many communities in rural areas. These advanced technologies are the key to many social benefits, among them: education, healthcare, commerce, access to government services and active participation by citizens in the formation of public policy.

Over the years, the State has been active at the national level in attempting to shape policy and ensure continued universal service support. The Executive Branch has the

ability to be an advocate at the federal level for Alaska's communication issues. Views held by the White House, the Congress and the myriad federal agencies – particularly the FCC – play an important role in shaping the formation of telecommunications policy that will ultimately affect Alaskans. At the state level, the governor is responsible for nominating RCA commissioners for six-year terms, subject to confirmation by the Alaska Legislature. In addition, the Governor's office manages state agencies and oversees procurement.

In addition to managing the administrative resources within the State, the Governor of Alaska also has an office in Washington, DC that works with federal officials in an ongoing capacity. The Governor's Office in Washington, DC has been involved in telecommunications policy at the federal level for over two decades. Its primary role in this area is to represent the interests of the State in legislation before Congress (including the Telecommunications Act of 1996) and in rulemaking and other proceedings before the FCC. In performing this task, the office works closely with other parts of the Administration, including the Lt. Governor's Telecommunications Information Council (TIC) and the Departments of Law, Administration and Education, and the Congressional delegation. It also regularly consults the RCA and relevant private interests, including telecommunications carriers serving Alaska.

State regulators have an important role in telecommunications policy, and maintain significant authority by the FCC and the 1996 Telecommunications Act. As the state regulatory commission for Alaska, the RCA has the power to make decisions regarding rates and tariffs for carriers operating within the State. The chair of the RCA is also a member of the Federal State Joint Board on Universal Service, which provides important input into FCC rulemaking.

Alaskan citizens benefit greatly from a range of federal support programs including the Low Income Program, the High Cost Program, the Schools and Libraries Program and the Rural Health Care Program. In addition, the State was granted an E-rate waiver, which enables residents to use public school facilities during off-hours for Internet access.

Satellite plays a key role in Alaskan telecommunications because of the rugged terrain, extreme weather and many sparsely populated rural areas. Satellite technologies have traditionally supported long distance service in the State, but they increasingly capable of providing services that compete with wireline broadband access and cable. This development bodes well for the State, as fiber or microwave deployments used extensively in other rural states are not feasible in many parts of Alaska.

At the State level, there are initiatives that can be encouraged, or issues to be addressed. Key recommendations include:

- Encourage the development of community and cooperative solutions.
- Identify and implement policies that will ensure competitive neutrality and encourage sustainable infrastructure build-outs.
- Foster Statewide access of advanced services in order to maximize benefit from eGovernment, distance education, telemedicine and commercial initiatives.

There are opportunities for continued active participation at the federal government level as well. Toward this end, Alaskan policymakers should:

- Continue to engage the FCC on issues critical to Alaska, and intervene as appropriate.
- Identify innovative telecommunication policy solutions utilizing multiple federal agencies.

Key policy issues are likely to come to a head in the next session of Congress, particularly if pressing national security issues dealing with terrorism and Iraq move from the forefront of the current legislative agenda. Definitions of universal service support, changing technological capability, infrastructure investment incentives and increasing intermodal competition are causing existing statutes to be re-examined. As momentum builds to revise public policy, Alaska's administrators, legislators and regulators should take the opportunity to be more active than ever at the federal level.

The following issues will be elaborated and analyzed, with implications for future public policy initiatives:

- Role of Alaskan institutions on telecommunications policy that impacts the State is critical. Alaska has been very proactive at ensuring that the need for support is understood at the federal level, as well as the consequences of policy decisions. The State's institutions have and should continue to speak with a unified voice
  - Executive Branch – Governor's Office
  - Governor's Office in Washington, DC
  - Alaska Legislature
  - State Regulators
  - Denali Commission

- Appropriate incentives to encourage competition should be continually reviewed in order to ensure a fair and neutral environment to all providers. Further, intermodal competition – across wireline, cable, satellite and wireless – is becoming more prevalent, and the definition of competitive boundaries in Alaska as elsewhere may benefit from re-examination.

- Proactive local community initiatives have consistently been a necessary catalyst for advanced services to remote villages and regions. A function of both education and cooperative efforts at the local level, such programs should be nurtured and encouraged.

- Measured, methodical approaches are key to successful sustained entry by competitive providers. While many carriers have been guilty of over-investment, overextension, and ultimately bankruptcy, others continue to operate by focusing on customer service and managing costs.

- Community Technology Centers – in effect a logical extension of the waiver the State obtained regarding the Schools and Libraries program – could be an innovative approach to providing advanced telecommunication services to

smaller villages. The tactic may be appropriate to include in the charter of the Denali Commission.

It is becoming increasingly clear that benefits to society from Internet access can be substantial. From education to healthcare to commerce, as well as active participation in government, the Internet and broadband technologies have the potential to touch the lives of all citizens. With that in mind, Alaskan representatives should strive to take that message forward in policy discussions at the state and national levels. If these issues are important to other states, they are essential to Alaska.

Introduction

Purpose of the Telecommunications Study

The purpose of this report is to provide the State of Alaska with a set of recommendations, based on best practices nationwide, for a statewide framework that promotes a cost effective delivery of telecommunications services throughout Alaska.

The report's recommendations addresses the following six policy goals for telecommunications services for both urban and rural residents:

1. Universal service of both basic and advanced services.
2. Appropriate level of government involvement to ensure competitive neutrality and consistent service.
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5. Consistent actions across State government to promote universal service, infrastructure development, competitive neutrality, and appropriate regulation.
6. Implementation of the Telecommunications Act of 1996 in Alaska in a manner that addresses the State's unique characteristics.

In 1996, Congress passed the Telecommunications Act, which was the culmination of efforts by legislators, regulators, consumers and industry to pave the way for competition. The Act increased expectations about the number and types of services that would be made available through competition, and at the same time, made provisions for rural states, such as Alaska, regarding universal service. Public policy issues have been raised in the process, many of which remain unresolved.

In the six years since the enactment of the Telecommunications Act of 1996, the telecom environment has changed significantly. Large regional Bells, which were expected to offer a wide range of new services, have merged with each other, and are integrating acquisitions, while also working to obtain approval to sell long distance.

In Alaska, where no regional Bells operate, there are still comparisons that can be made. The incumbent LEC (Local Exchange Carrier), ACS, for example, is also integrating operations as a result of acquisitions. However, while RBOCs are required to obtain state and FCC regulatory approval to sell long distance services, other ILECs such as ACS are not similarly constrained and need only obtain approval from the FCC.

At the backbone level, nationally and internationally, several broadband carriers, which were hailed as the torchbearers of the new information superhighway, with sustainable

triple digit (and higher) growth rates, have now declared bankruptcy. Still more carrier appear poised to befall a similar fate, and even the Bell companies are under pressure.[1]

The dot.com business model, at first full of promise, has largely imploded. The dot.coms had been a significant driver of telecommunications infrastructure spending and projected future demand. Their massive demise thus spilled over into the telecommunications industry, at first engulfing many competitive local access providers (CLECs), and then the larger backbone Internet carriers such as Global Crossing, 360networks and XO Communications.

In order to appreciate the degree of carnage in the telecom industry, it may be useful to note widespread layoffs that have been announced by telecom equipment manufacturers and carriers. Some of these figures are highlighted in Table 1, and more have occurred in 2002. This downturn has implications for strategic decisions in both the public and private sectors, largely because investment money is increasingly scarce and reticent.

Table 1. – Announced Layoffs for Selected Telecom Firms

	Worldwide Employment January 2001	Worldwide layoffs announced in 2001	Layoffs as a percentage of year-beginning level
Nortel Networks	94,500	49,000	51.9
Lucent Technologies	113,400	44,910	39.6
Solectron	54,000	20,700	38.3
Corning	40,300	12,000	29.8
Motorola	147,500	39,000	26.4
Alcatel	131,598	33,000	25.1
Ericsson	92,949	22,000	23.7
Cisco Systems	38,000	8,500	22.4
Qwest	67,000	11,000	16.4
Marconi	56,000	7,000	12.5
Siemens	448,000	17,000	3.8
Verizon	260,000	7,500	2.9
Nokia	60,173	1,250	2.1

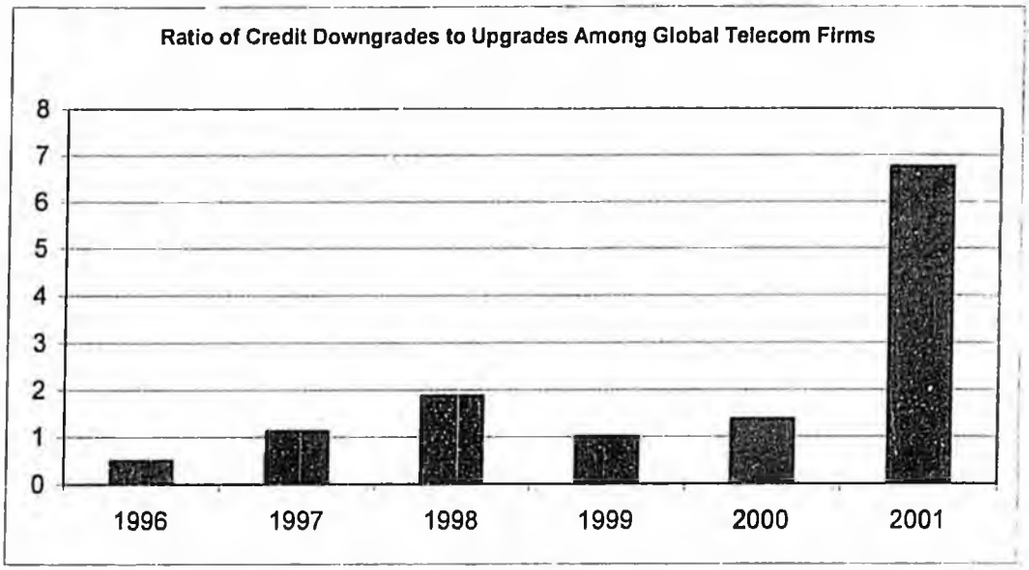
NOTE: Layoffs are those announced between Jan. 1 and Nov. 22, 2001. SOURCES: Financial Times; Yahoo! Finance. Firms with U.S. Operations Source: Federal Reserve

Further evidence of the stress on the industry can be seen Figure 1, which demonstrates the marked increase in the number of credit downgrades in telecom firms. Additional downgrades have occurred in 2002, and both WorldCom and Global Crossing have

[1] Young, Shawn. "SBC to Lay Off 11,000 More Workers: Economy and Competition Take Toll on Regional Bells, Steady Earners in the Past", *Wall Street Journal* (September 27, 2002) p.A3.

since declared bankruptcy. Even so, it appears that the telecommunications industry has still not bottomed out.[2]

Figure 1. – Recent Telecommunication Credit Downgrade Activity



Notes: Ratios are based on Moodys' credit ratings on long-term debt of telecommunications companies worldwide. Source: Bloomberg, Federal Reserve

It is possible that one or more of the RBOCs may be forced into bankruptcy because of debt burdens and an eroding local customer base in traditional voice service.[3] The current oversupply of carrier and manufacturing capacity will almost certainly be resolved through widespread industry restructuring and consolidation, and has potential implications to the Alaskan ILECs as well. Alaska's largest ILEC, ACS, covers approximately 68% of local wireline in the State. In addition to ACS, Alaska has dozens of independent incumbent local exchange carriers (ILECs).

What appeared to be vibrant competition across the industry has proven uneven because of capacity overbuild at the backbone level, and no commensurate supply increase at the local level – a by-product of regulation and over-investment. The situation has been further exacerbated by accounting irregularities on the part of some carriers in an apparent attempt to meet inflated investor expectations. Taken together, these events have left the telecommunications industry with a gloomy outlook, as forecasts continue to be scaled back.

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[2] Berman, Dennis. "Lingering Telecom Slump Squeezes Gear Makers' Revenue", *Wall Street Journal Heard on the Street* (August 29, 2002) p.C1.
Heinzl, Mark and Dennis Berman. "For Lucent and Nortel, Cash Isn't a Cushion: Investors Flee Hart-Hit Telecoms, Worried Revenue Won't Pick Up Soon Enough to Slow Burn Rate", *Wall Street Journal* (September 19, 2002) p. C1.

[3] Woolley, Scott. "Bad Connection" *Forbes* 170:3 (August 12, 2002).

Telecommunication Services and Players

Current State of the Industry

The stress on telecommunications industry stems from system-wide overcapacity at the backbone level, compounded by pressure from investor expectations. After the passage of the Telecommunications Act of 1996, several companies began building national and international fiber networks based on euphoric predictions about the rate of growth of broadband use, among them Global Crossing, Qwest, Tyco, Level 3. In the course of building out their networks, these carriers accumulated billions of dollars of debt on their balance sheets. However growth at the local access level was not proportionate, since technologies such as DSL and fiber to the curb were and are still being built out.

This overcapacity has put pressure on prices and earnings. Rather than attempt to adjust investor expectations, some broadband carriers began engaging in accounting practices aimed at improving quarterly financial statements. One approach was to exchange capacity with another carrier and immediately recognize all of the anticipated revenue in the first year, but then book the purchase as a capital item and expense it over twenty years to lower reported annual expenses[4].

WorldCom, which had acquired its UUNet fiber backbone, fueled financial market expectations of 1000% per year growth by classifying the entire potential capacity of copper and fiber deployments as actual usage. So, for example, a customer's new T1 (1.5 Mbps) line was reported to the media as if it were being utilized at full capacity all day, every day – even though actual T1 utilization fluctuates regularly and substantially.[5]

The final straw for WorldCom was the revelation that billions of dollars in interconnection charges owed to other carriers were capitalized over a period of years – instead of being expensed annually – thus inflating earnings. Combined with WorldCom's huge debt load of approximately $41 billion[6], the company was forced to declare bankruptcy.

Alaskan carriers have moderate or minimal levels of exposure to the WorldCom bankruptcy. ACS, for example, has calculated its potential impact at about $50,000. For GCI, the situation is more significant. In the second quarter, the company wrote off $9.7 million of a total potential exposure of $16.2 million, although GCI did receive $3.5 million in September, reducing the company's exposure by that amount. In addition, WorldCom also owns approximately 9% of GCI, which could depress the share price if creditors force WorldCom to liquidate its equity stake.

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[4] While AT&T engaged in broadband swaps, similar to other broadband carriers, their treatment of costs and revenues were consistent, with both observed incrementally over the life of the contracts.

[5] Dreazen, Yochi. "Behind the Fiber Glut: Telecom Carriers Were Driven By Wildly Optimistic Data on Internet's Growth Rate", *Wall Street Journal* (September 26, 2002) p. B1.

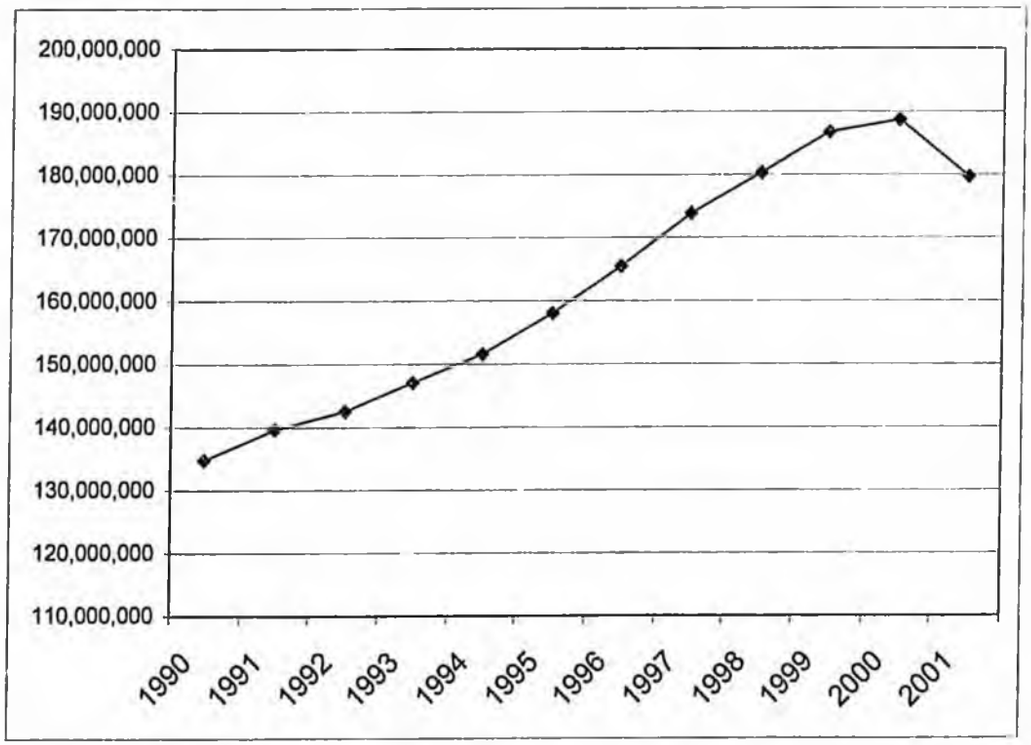
[6] Young, Shawn. "In Bankruptcy, Getting Laid Off Hurts Even Worse: WorldCom's Ex-Employees Suffer Loss of Severance, End of Health Insurance", *Wall Street Journal* (September 30, 2002) p. A1.

Like ACS, AT&T Alascom has only moderate exposure to WorldCom's bankruptcy, which the company estimates at about $350,000. However, the impact of AT&T's pending separation of its business and consumer telecommunication groups on Alascom – with declining margins in the long distance business[7] – is uncertain.

Local Telephone Service

Across the U.S., there is some evidence of competition at the local level, but it is still selective. The most widespread form of competition in wireline voice is wireless telephones. Anecdotal data suggests that some households have even begun to replace wireless with tradition voice lines. In other cases, line-shared DSL often means that local customers no longer need a second or third phone line for data. The implications for these developments can be seen in Figure 2, where the rate of growth in access lines increased steadily between 1992-1997 and has been slowing since then. The total number of access lines peaked in 2000, and then actually declined last year.

Figure 2. – U.S. Access Lines 1990 - 2001



Source: FCC

To-date, competition for local service nationwide, as well as in Alaska, has focused more on urban customers than rural ones for obvious reasons. Urban areas have higher customer densities, higher usage requirements. They generate more total revenues,

[7] Providers coming out of bankruptcy, relatively debt free, may put additional pricing on margin pressures on long distance services.

and the resulting cost per increment of service is lower. All thing being equal, urban markets are simply more attractive. In the relatively urban areas, Alaska enjoys robust competition for local exchange service.

Long Distance Services

Long distance competition was introduced in the U.S. in a very limited form by MCI in 1969, when the company was granted the right to provide business long distance services by microwave from Chicago to St. Louis by the FCC. With the break-up of AT&T, competition accelerated in 1984. The approach taken by the FCC, which favored newer entrants relative to the dominant carrier to foster competition[8], has generally served as the model in the U.S. for subsequent telecommunications deregulation efforts. MCI, followed by Sprint, began competing with AT&T, and – through what might be termed managed deregulation – competitive long distance networks were built out in the U.S. Increased competition resulted in lower prices to the point that interstate long distance calls now typically cost consumers less than $0.10 per minute.

Intrastate long distance service in Alaska is normally priced at the margins for the interexchange carriers, but is still relatively high compared to the lower 48, given the intrastate interconnection charges to local LECs of 13.1 cents, on average, per conversation minute[9]. The RCA estimates that these access charges would decrease by approximately 9.7 cents per conversation minute to between 3.3 and 3.4 cents per conversation minute if they were shifted to the end user in the form of monthly rate increases.[10]

Internet Service

Internet services are provided to subscribers, either on a dial-up or dedicated access connection, over telephone lines by Internet Service Providers (ISP). In larger cities, these services are provided on a local dial-up basis. However in many rural parts of Alaska, there are no local providers for dial-up Internet access over telephone lines. Consumers in these locales must either access the Internet through a long distance connection, or some other access mechanism such as satellite or cable. Current federal programs do not include Internet support for high cost areas.

Mobile Wireless

Mobile wireless services in the U.S. are used primarily for voice or limited data traffic. While some next generation (2.5G) wireless phones are being introduced, their degree of acceptance is still limited. Bandwidth for 2.5G mobile devices is limited to about

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[8] Stone, Alan. *How America Got On-Line*, M.E. Sharpe: New York (1997) pp.66-80.

[9] The national average for conversation access minutes is between 1.91 cents and 7.88 cents. Conversation minutes accounts for access charges for both the origination and termination of the call by the respective LECs.

[10] RCA R-01-1, Order No. 1, "In the Matter of Consideration of Reform of Intrastate Interexchange Access Charges (April 11, 2001).

50Kbps. Even 3G devices – widely used in Japan – provide data speeds of only about 144 Kbps[11], which is usually considered to be the minimal requirement for classification as a broadband service[12].

For the larger cities, the likely next move by wireless carriers will be toward consolidation. Mobile operators can be expected to scale back rate discounting and the number of minutes offered in calling plans. Nationally, as growth in mobile wireless slows, and the telecommunications industry remains under financial pressure, carriers are focusing on near term profitability.

Narrowband Internet Service

Telephone Internet connections top out at 56 Kbps on a traditional analog line. In order to support this service, the serving central office (CO) must be digital. This service is available in the larger communities in Alaska on a local dial-up basis, but is still not available for many of the remote communities. Outside of the E-rate program for schools, libraries and health facilities, there are no specifically earmarked federal funds – such as the High Cost Fund – for subsidization of Internet service. According to a report prepared for the Denali Commission[13], 164 of the 267 communities studied (61%) did not have local dial-up Internet access.

It should be noted however, that GCI has announced plans to provide local Internet access at urban rates to many of these 164 communities with newer, lower cost ground station technology. For now, the Denali Commission is adopting a wait-and-see attitude, but may consider proposing new telecommunication policy initiatives in the future, depending on the success of GCI's efforts.

Broadband Internet Service

Broadband Internet service can take a variety of forms. Cable modem broadband service is the most popular broadband access service with about 5.2 million subscribers nationwide. DSL (Digital Subscriber Line) is also a popular high-speed service, with about 2.7 million subscribers, and makes use of existing copper phone lines.[14] DSL can transmit up to 8 Mbps downstream and 2 Mbps upstream. Higher quality business class connections over existing phone lines[15] are available at speeds of 1.5 Mbps (T1) and above. With the exception of ILEC DSL, broadband Internet providers are largely unregulated. In addition to cable, broadband services are available over other access mechanisms such as fixed wireless and satellite.

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[11] Dornan, Andy. "Sprinting Ahead in the Race to 3G?", *Network Magazine* 17:10 (October 2002) p. 16.
[12] The FCC only reports on high speed connections of 200 Kbps or higher.
[13] McDowell Group. *Inventory of Rural Alaska* (January 2001).
[14] FCC's 3rd Advanced Services Report (2001).
[15] T1 connections require two phone lines; DSL requires only a single phone line and may be dedicated; ADSL (Asymmetrical DSL) can share an existing voice line.

Fixed wireless access is a relatively newly commercialized broadband technology used to provide a high-speed transmission system from a communications carrier to a residential or business customer. While some wireless systems support mobile customers and applications (e.g. cell phones, Blackberrys, PDAs), fixed wireless is designed for communications to devices that remain stationary, and the technology supports much higher bandwidth capacity.

Fixed wireless, along with digital subscriber line (DSL), cable modems, and satellite are all potential transport vehicles for high-speed Internet access. Moreover, voice, video, entertainment and other services that require substantial bandwidth will also be important, because the general availability of such applications will in turn drive the adoption of new broadband access connections.

One example where fixed wireless is being used effectively in Alaska is the Maniilaq Consortium, which has partnered with a regional ILEC (OTZ) and GCI to provide broadband services to 12 communities in rural Alaska. Half of the subscriber base is using fixed wireless as the last mile transport mechanism; the other half qualify for DSL access.

Nonetheless, local access technologies are still in a state of experimentation, as Figure 3 indicates. Attempting to identify when and where a given technology will achieve widespread adoption is often an uncertain proposition.

Figure 3. – The Difficulty of Predicting Technology Acceptance

A major competitive carrier had made an initial assessment on a new technology that provided data transport of between 3Mbps up to 100Mbps over the Internet. The carrier partnered with a wholesale provider of local bandwidth access that was building out a national footprint. Because the national build-out was in its early stages, it was determined that a market trial would be the best way to gauge which bandwidths and price points that customers would find most attractive.

The fixed wireless local loop (WLL) technology was designed to offer customers substantial bandwidth through the combined network of the two competitive carriers, bypassing the ILEC (Incumbent Local Exchange Carrier) altogether and thus reducing provisioning time substantially. It is not unusual, for example, for ILECs – in conjunction with long haul carriers – to require 90 days or longer to provision such service. The WLL product, by contrast, could be provisioned within 10 days.

The service was based on Triton 38Ghz radios transmitting a point-to-point signal from the rooftops of 18 buildings in the San Jose area that were available for the duration of the trial. Service was limited to the businesses located in the "lit" buildings, all multi-tenant structures.

Operational capabilities were established across departmental groups and between competitive carriers. Training materials were developed and rolled out to the sales force in San Jose. Prior to the trial launch, the sales reps were queried regarding their perception of the offering, specifically in relation to their clients. Without exception, the entire sales team was enthusiastic about the product's prospects, and was anxious to begin selling. This perspective meshed well with management's view that the company had a winning technology on its hands.

Immediately after the training, the sales reps canvassed the tenants in the 18 buildings in which the wireless broadband service was available. After six weeks of intense prospecting, not a single circuit had been sold. Why?

While the initial concept had been attractive (as is often the case with new product concepts), the reality proved otherwise. One of the roadblocks to success had to do with the nature of the customers in the service coverage area. The occupants of the multi-tenant buildings were employees of branch offices of larger corporate entities, or small business owners. As a result, they did not require such large amounts of bandwidth – even a 3Mbps connection on the low end of the offering, much less anything approaching 100Mbps.

Further, pricing of the WLL product was only slightly discounted relative to the dedicated Internet access fiber offering, so it was perceived as expensive. Yet, the pricing from the wholesale partner did not enable steep discounts on the service.

Weather was also a factor, as the signal from building to building could be affected by rain or snow conditions. While this particular issue had been anticipated and could be addressed by boosting the signal in certain weather conditions, taken together with the other objections, the offering was a non-starter.

One of the assumptions that had been made about the WLL offering was that it could be provisioned to locations where fiber was not easily accessible – across rivers in metro areas, for example. These initial assumptions proved faulty, however. For one, WLL's reach was not much greater than typical fiber MAN (Metropolitan Area Network) build-outs, since the radio antennas had to be linked by buildings with a proximity to each of three miles or less. And secondly, a large corporate site that would utilize such large blocks of bandwidth is a very attractive customer, and one or more telecommunication carriers would invariably dig a trench and supply a fiber connection to the building or campus.

So for all the advantages – extremely short provisioning time, competitive SLAs (Service Level Agreements), substantial broadband capacity – there nonetheless were still unanticipated impediments to customer acceptance. New technologies are often viewed from an overly optimistic lens that fails to pan out upon closer inspection. The dot.com bust and telecom bubble are both prime examples.

Source: BearingPoint (formerly KPMG Consulting) Spring-Summer 2000

Commercial Carriers

ACS and Other ILECs

ACS is the designated Local Exchange Carrier (LEC) for the majority of the infrastructure in Alaska. ACS currently provides service to approximately 68% of the State's population, which encompasses 74 communities with over 400.000 business, government, and residential subscribers. ACS provides the following services to their subscribers:

- Residential
- Business Services
- Local Phone
- Long Distance
- Wireless
- Cellular Phone Service
- Paging
- 2-way SMS Messaging
- Internet Services
- Messaging
- Complete Unified Messaging Platform of Services
- Data

ACS has had its most profitable markets (Anchorage, Fairbanks, and Juneau) heavily penetrated by competition. Although the company maintains substantial legacy infrastructure, ACS has initiated the development of its next generation network by implementing MPLS within the core, which appears to be the most likely means of enabling VoIP (Voice over Internet Protocol), essentially packet-switched voice services.[16]

It is expected that the MPLS build-out will greatly accelerate as a result of the $92 million contract with the State of Alaska. The contract has been awarded to ACS for the interconnection of all the State government offices. As a result of the implementation, ACS will have in place an advanced network capable of allowing next generation telecommunications to many rural communities, in effect utilizing the government of Alaska as an anchor tenant. Williams Petroleum has signed on with ACS as one of the first, and to-date, the largest customer on the advanced MPLS network.

Alaska has a large number of independent ILECs that serve rural areas throughout the state. Their focus has traditionally been on local phone service, and Alaska now has telephone penetration rates comparable to the rest of the U.S. More recently these ILECs have started to provide advanced telecommunications offerings such as Internet and broadband services. A sampling of some of the larger ILECs and the communities they serve include:

[16] As opposed to circuit-switched voice service currently provided by most carriers.

- Bristol Bay Telephone Cooperative
  - *Ekwok, Igiuig, King Salmon, Koliganek, Levelock, Naknek, New Stuyahok*
- Bush-Tell Incorporated
  - *Aniak, Anivak, Crooked Creek, Grayling, Holy Cross, Kalskag, Lower, Kalskag, Upper, Red Devil, Shageluk, Sleetmute, Stony River*
- Copper Valley Telephone Cooperative
  - *Chistochina, Chitina, Copper Center, Gakona, Glennallen, Gulkana, Kenny Lake, Lake Louise, McCarthy, Mentasta, Nelchina, Paxson, Slana, Tatitlek, Valdez*
- Codova Telephone Cooperative
  - *Cordova*
- Interior Telephone Company
  - *Cold Bay, Cooper Landing, Dutch Harbor, Fort Yukon, Galena, Iliamna, King Cove, Newhalen, Port Lions, Sand Point, Squaw Harbor, Unalaska*
- Matanuska Telephone Association
  - *Anderson, Big Lake, Cantwell, Chickaloon, Chugiak, Clear, Eagle River, Eklutna, Healy, Houston, Kantishna, Knik, McKinley Park, Palmer, Peters Creek, Petersville, Point MacKenzie, Sutton, Talkeetna, Tyonek, Wasilla, Willow*
- Mukluk Telephone Company/TelAlaska
  - *Brevig Mission, Council, Diomede (Little), Golovin, Koyuk, Saint Michael, Shaktoolik, Shishmaref, Stebbins, Teller, Wales, White Mountain*
- Nushagak Telephone Cooperative
  - *Aleknagik, Clarks Point, Dillingham, Ekuk, Manokotak*
- OTZ Telephone Cooperative
  - *Ambler, Buckland, Candle, Deering, Kiana, Kivalina, Kobuk, Kotzebue, Noatak, Noorvik, Selawik, Shungnak*
- Summit Telephone Company
  - *Chatanika, Chena Hot Springs, Cleary Summit, Coldfoot, Wiseman*
- United Utilities
  - *Akiachak, Akiak, Alakanuk, Arctic Village, Atmautluak, Beaver, Birch Creek, Central, Chalkyitsik, Chefornak, Chevak, Chuathbaluk, Circle Hot Springs, Eek, Emmonak, Gambell, Goodnews Bay, Hooper Bay, Kasigluk/Akolmuit, Kipnuk, Kongiganak, Kotlik, Kwethluk, Kwigillingok, Lake Minchumina, Lime Village, Livengood, Manley Hot Springs, Marshall, Merkoryuk, Minto, Mountain Village, Napakiak, Napaskiak, New Chenega Bay, Newtok, Nightmute, Nikolai, Nunapitchuk, Oscarville, Pilot Station, Pitkas Point, Platinum, Quinhagak, Rampart, Russian Mission, Saint Marys, Savoonga, Scammon Bay, Sheldon Point, Stevens Village, Takotna, Telida, Togiak, Toksook Bay, Tuluksak, Tuntutuliak, Tununak, Twin Hills, Venetie*

CLECs

The largest CLEC in the Alaska telecommunications arena, GCI, has approximately 40% of the local phone business in Anchorage. GCI provides the following services:

- Long Distance
- Local Phone
- Cable Television
- Internet Services

GCI plans to continue to grow in the urban areas of Alaska, as well as build out into the rural communities by leveraging its E-rate and Rural Healthcare contracts. The company's portfolio includes access to 90% of the households in the State as a result of its acquisition of cable assets in the State. Once digital voice is provided over that network, GCI will be positioned to offer local telephone service through its own facilities. GCI has indicated plans to provide voice, data, and video services bundled together in a full package.

Wireline Long Distance Companies

GCI and AT&T Alascom have approximately equal shares of long distance services sold in Alaska at 45%, with ACS filling in the remaining 5-10%.

AT&T Corporation operates four separate business units: Broadband, Wireless, Business and Consumer service. AT&T, operating under the subsidiary of AT&T Alascom, is currently the largest long distance carrier in Alaska, and AT&T is the long distance carrier of last resort (COLR). COLR obligations require Alascom to provide long distance service to all communities of more than 25 people who request such service[17].

When AT&T purchased Alascom, regulators required that Alascom continue to operate as a separate subsidiary and that Alascom provide a wholesale service to its competitors to allow them to provide service in bush communities where competitors are not permitted to construct their own equipment. AT&T has asked the FCC and the RCA to permit it to offer long distance service in Alaska directly (that is, not through Alascom) and to eliminate the requirement for the wholesale service tariff. The FCC imposed certain conditions on the transfer of control of Alascom, including the condition that AT&T continue to comply with rate integration requirements and that Alascom continue to provide a wholesale service to competitors.

AT&T currently owns and maintains 200 C-band earth stations to meet universal access requirements. In approximately 3-5 years, the earth station network will need to be replaced, which AT&T estimates will cost between $40-50 million, or $200,000-250,000

[17] FCC's Memorandum Opinion and Order (FCC 94-116, Released 5/24/94, CC Docket No. 83-1376, Footnote 52).

per site. Given the current turmoil in the telecommunications industry, the business case for updating the network using C-band earth station technology may not be compelling.

Mobile Wireless Service Providers

As might be expected, competition in mobile wireless has been significant only in the larger communities such as Anchorage. ACS covers the South Central, Interior, Southeast and parts of the North Slope. MTA Wireless competes in the South Central area, with roaming agreements east and north to the Fairbanks area. Outside the larger cities, however, competition is more sporadic. Some regional cooperatives such as OTZ and Unicom provide service to their local calling areas.

DBS

Direct Broadcast Satellite (DBS) enables reception of television programming by relatively small, inexpensive satellite dishes, typically 24-36 inches in diameter. However, north of Fairbanks, reception requires the use of 48 or even 60-inch satellite dishes to receive signals. From its introduction to the U.S. in 1994, DBS immediately began taking market share from cable television providers. Significant numbers of Alaskans – as many as 6000 – still use the larger C-band satellite dishes that DBS began to replace in 1994. This compares with approximately 16,000 households in Alaska that had DBS as of January 2001[18].

The two main providers of DBS service nationwide and in Alaska are DirecTV and Dish Network. StarBand also uses Dish equipment to provide broadband Internet services, with speeds between 150 Kbps and 500 Kbps.

Convergence

In the aftermath of 9/11 and the U.S. recession, trends relating to Information and Communication Technologies (ICT) have changed substantially. Public policy is straining under the impact of increased demands for security, allegations of corporate fraud, and over-investment in the telecom sector. Debates continue at the state and national levels regarding the proper role of regulation.

While there is a general consensus on increased scrutiny of financial reporting in the telecommunications industry (and others), the nature and degree of appropriate regulation remains unresolved. Given the recent emphasis on national security issues, it is unlikely that any federal legislative initiatives dealing with telecommunications[19] will be taken up until well into 2003 at the earliest.

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[18] McDowell Group. *Inventory of Rural Alaska* (January 2001).

[19] For example, the Tauzin-Dingell bill (House of Representatives) or Breaux-Nickles plan (Senate), both of which would liberalize current restrictions on ILECs, thus making broadband regulation for local telephone companies more comparable to that of satellite and cable companies.

In the meantime, technology is enabling new applications, and innovative ways to structure companies and workforces. Trends, such as the increasing use of Voice over Internet Protocol (VoIP), employing call centers for both core and support functions, and transferring internal operations to Application Service Providers (ASPs) will transform organizations. Because of recession and uncertainty following 9/11, the pace may have slowed, but the forces of change are inexorable.

Increasing Use of Standard Protocols

Many industries that began as natural monopolies have become competitive industries over time, and telecommunications at the local access level may turn out to be no different. As examples, improved transportation systems such as waterways and railroads transformed many local monopoly markets for goods into regional and national markets. In the case of telecommunications, the potential for such a transformation lies in deregulation, industry consolidation, and the increased use of standard protocols (to enable interconnection).

The adoption of industry standards, for example, will draw investment from a larger pool of capital, because the potential market size is larger for both carriers and equipment makers. The use of standards also commoditizes basic services, which benefits consumers through increased competition and lower prices. Once standard protocols are in place, carriers must provide new products and services in order to differentiate themselves, which benefits consumers and businesses.

In the current environment, it is still problematic for both incumbent and competitive local access providers to fulfill customer expectations for some products, such as DSL. Further, because of regional separation for many years, and a lack of viable competition as a result of regulated monopoly, ILECs have developed proprietary standards that are often difficult to interface.

Public Policy and the Formation of New Industries

Technology convergence will force issues into the public policy realm because the regulatory boundaries separating industries are blurring. When it is possible to use cable to make local and long distance telephone calls, then local access will consist of four potential media: wireless, wireline, satellite and cable, at least where geographical, physical and economic conditions permit. While this is true in most large metropolitan centers, it may not be true for many rural communities, an issue perhaps much more acute for Alaska. Nonetheless, innovative use of new technologies in Alaska, such as relatively low-cost fixed wireless, and Ku-band satellite ground stations, suggest that consumer alternatives will continue to increase.

Telecommunication is similar to many network technologies that have come before. Other examples include railroads, electricity, the interstate highway system, the airline industry, energy pipelines, the basic telephone (POTS – Plain Old Telephone Service), and multi-channel video distribution (cable and satellite). Each technology caused existing industries to restructure and/or created new ones entirely. While some overbuilt

initially in a speculative frenzy (e.g. railroads), their impact on the country was to increase productivity, reconstruct value chains and transform entire economies.

It appears likely that in many parts of the United States, various forms of access will eventually be capable of delivering equivalent services – the much-heralded convergence. But how quickly this transition takes place is not clear. In areas with smaller populations, revenues relative to costs may not support multiple competitors for local telephone service. Even with portable High Cost and Low Income universal service fund (USF) programs, competition in smaller communities may not be viable. While competition was intended to transform telecom, local access suffers because it is not always perceived to be an attractive market opportunity for would-be entrants.

At the consumer level, prices for products such as long distance, local service and Internet have probably fallen as far as they can for the foreseeable future. Investment into new productivity or capacity enhancing technologies continues to be ratcheted back significantly. There is also a move by wireless carriers to raise fees for service and scale back on minutes offered.[20] While larger cities, including Anchorage, may have as many of five cellular providers, those numbers are likely to be reduced because of industry consolidation and increased pressure on providers by investors to become profitable.

In the years following the 1996 Telecommunications Deregulation Act, there was widespread euphoria regarding the new business opportunities. In the aftermath of the dot.com and telecom busts, the information and communications technology (ICT) industries are set to restructure and consolidate. There will be fewer long haul providers and equipment manufacturers. Competition will continue across the four major access mechanisms - wireline, wireless, satellite and cable – as each focuses focus on areas of strength. Over time, providers in each category will look for opportunities to offer additional services – including local access – and effective competition will become more prevalent as a result.

Digital Voice Over Multiple Access Media

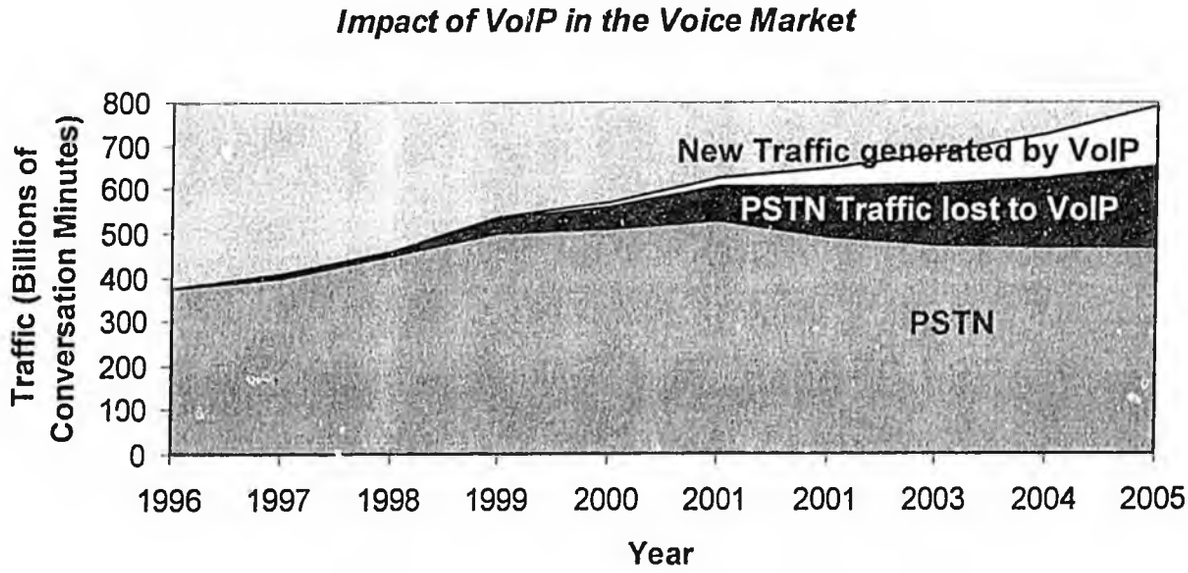
An example of how technology is poised to transform the telecommunications industry is VoIP (Voice over Internet Protocol) – the use of packet switching to transmit voice traffic over the Internet. Currently the Internet is used primarily for data and video traffic, while voice conversations are transmitted over traditional telephone equipment. The cost for telephone equipment is lower with VoIP, and transport can be performed over Internet facilities that already provide data or video services.

Since industry is often a driver for new technologies (that are in many cases eventually adopted by consumers as well) the use of VoIP technologies by business is important also. For call centers, traditional voice service requires that different types of equipment – such as switches, routers and handsets – must be installed to support voice traffic on the one hand, and data traffic on the other. Less equipment is needed for VoIP, and the set-up costs are less expensive as well. Once quality of service issues for VoIP have

[20] Epstein, Reid. "Cellphone Plans' New Tactic: Nickel and Diming You: Companies Add Fees, Charge to Check Minutes", *Wall Street* Journal (August 29, 2002) p. D1.

been addressed, as appears likely, the use of the technology is expected to become widespread. Trends are outlined in Figure 4.

Figure 4. – VoIP Trends



Source: Ovum, IDC (1999)

While many promising technologies are on the horizon for alternative means of local telephone service, the deployment of these technologies remains at an early stage. For example, although cable television has reached a high degree of penetration throughout the U.S., as well as Alaska, the use of cable for local phone service remains fairly low, as can be seen in Table 2.

Nonetheless, several cable companies continue to make forays into the local voice market, and GCI has also indicated its intention to trial voice service soon in Alaska. The numbers suggest that competition by cable for local telephone service is positioned to increase. From a policy perspective, in markets served by cable (197,000 homes out of an estimated 220,000 in Alaska – approximately 90%), the case for comparatively heavy regulation on ILECs may be counterproductive to competition, since many homes now have two physical access media capable of high speed broadband and voice service.

Table 2. – Cable Phone Service Penetration

Company	Cable Subscribers (millions)	Local Phone Subscribers
AT&T Broadband	13,300,000	1,200,000
Cox	6,300,000	578,000
RCN	507,000	190,000
Comcast	8,500,000	40,000
Insight	1,400,000	20,000

Source: the companies (Sept 5, 2002)

Nationally, the growth of cable television is an interesting example of an innovative technology that sprang up largely because of consumer demand, once it graduated from broadcast-only television to premium services such as HBO. For most of its history, cable was not a competitor to telephone service, and was not initially regulated. However, cable is now poised to provide real competition in telecommunications services, as digital voice technologies continue to mature. At the same time, cable increasingly faces competition from satellite television providers such as Dish Network and DirecTV[21]. In some markets, preliminary indications are that cable prices are beginning to level off because of competition.[22] Where satellite footprints are not obscured by mountainous terrain in Alaska, or low elevation angles in the northern and western parts of the State may make satellite service unavailable, the marginal costs for providing service are similar to other parts of the country and can be expected to provide competition to cable service.

While the competition from satellite is not identical to cable service, as Appendix II illustrates, the different services foster growth through the development of new market segments, and a broader base of customers and users. For example, while satellite service does not offer local television channels, it will be possible for residents to obtain news on local events as Internet services begin to be offered over satellite[23], particularly if smaller communities embrace the use of web services to communicate, interact and transact locally.[24]

Implications of Intermodal Competition

[21] Early indications are that a proposed merger between EchoStar (Dish Network) and Hughes Electronics (DirecTV) will not be approved, as the FCC has indicated its intention to block the proposed transaction. Dreazen, Yochi and Andy Pasztor. "Regulators Are Set to Block EchoStar's Purchase of Hughes", *Wall Street Journal* (October 7, 2002) p. A22.

[22] Grant, Peter. "The Cable Guy Cuts His Rates: As More People Choose Satellite TV, Companies Offer Cheaper Packages; a Price Freeze in St. Louis", *Wall Street Journal* (September 25, 2002) p. D1.

[23] StarBand (www.starband.net) currently offers Internet service using Dish Network satellite equipment.

[24] As well as regionally, nationally and internationally.

As Table 2 indicates, the numbers show that only a portion of households have cable telephony of the estimated 102.2 million total local telephone access lines. However, as the product matures, cable telephone service may gain more widespread availability and acceptance. There are about 2.2 million coaxial cable connections providing local telephone service, which constitutes about 1% of nationwide switched access lines.[25]

The cable industry was deregulated in 1996 (after being re-regulated in 1992), with the expectation that local telephone service would soon follow. However, penetration of local phone service by cable providers to-date has been low. Research also suggests that cable prices have risen faster than inflation.[26] At the same time, it should be noted that the digital cable infrastructure necessary to provide telephony has not yet reached widespread deployment in the U.S.

It can also be argued that because the cable companies have been free to increase rates, they created – perhaps unwittingly – a correspondingly attractive market opportunity for satellite television providers to enter as substitutes. Hence, if progress in cable telephony seems slow, it should be tempered with the knowledge that telecommunications technologies have not reached the degree of maturity that other related technologies have, including digital voice service over cable. From a policy perspective, this suggests that deregulation, or a less intrusive regulatory environment, can encourage the development of new services, if given enough time – even if it means that prices may rise in the near term.

Technological Change and Product Development

Generally speaking, telecommunication technology and applications have been changing faster than many information technologies over the past few years, particularly with regard to productization and market introduction.[27] For example, an existing mainframe system, a technology that has been in use since the 1950s, can be expected to be relatively stable for at least five to seven years now. Desktop computer or laptop configurations – in use since the 1980s – are now relatively predictable for about three years, perhaps up to five. But telecommunications technologies can change almost from year to year, at least in terms of pricing for high bandwidth service, and advances in bandwidth throughput.[28]

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[25] FCC. "Local Telephone Competition: Status as of December 31, 2001", *Industry Analysis and Technology Division; Wireline Competition Bureau* (July 2002).

[26] The National Cable and Television Association attributes the increases in costs to new programming and capital expenditures.

[27] A caveat regarding commercialization is specifically inserted here to address the fact that DSL (Digital Subscriber Line) technology had been developed and available to the RBOCs at least ten years before it went into commercial use after the passage of the 1996 Telecommunications Act. The RBOCs were reluctant to cannibalize their lucrative T1 (1.544 Mbps) revenues that DSL would have at least partially displaced, and it was only when confronted with direct competition from Northpoint, Covad, Rhythms, and other CLECs that the RBOCs began aggressively offering DSL service.

[28] This relationship can be demonstrated in best practices from outsourcing advisors, who indicate that the contract term should correspond to the degree of change in the technology being outsourced. These advisors recommend that customers outsourcing *telecommunications* services enter into shorter contracts, typically one year, and certainly no more than three. The

It may be useful to view last mile connections to the home not just from a telephony perspective, but also from its broader capabilities in terms of the type of content supported. While the often cited convergence is not yet upon us, Figure 5 perhaps suggests how far we have come. Figure 5 outlines where current gaps in service offerings lie for various forms of access (circled areas). It is important to note that the diagram addresses last mile access only, whether twisted pair copper, coaxial cable, wireless, satellite or perhaps even fiber.[29]

The areas circled identify current gaps in commonly available capabilities. At a high level, it is clear that cable has strength in some areas – notably in video content. In contrast, wireline and wireless have strengths in other areas – notably voice. Advances in technology may result in the closing of the gaps soon, which should lessen the need for regulation to engender competition.

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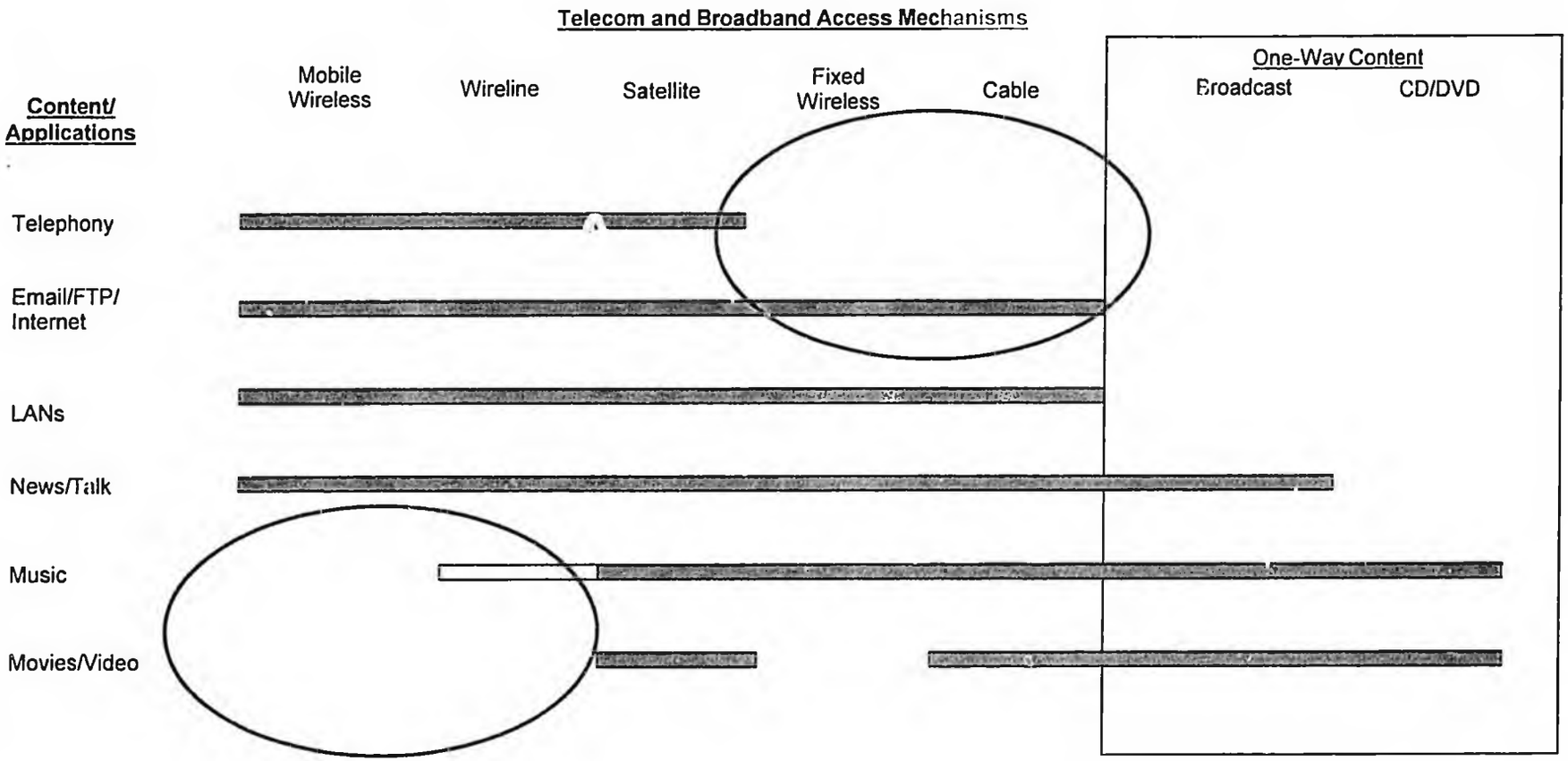
huge leap in throughput capacity made possible by OC-192 (9.953 Gbps), up from the previous capacity limit of OC-48 (2.488 Gbps) is an example of substantial throughput increases. T1 prices and other high bandwidth services have also seen double digit price decreases annually.

[29] By contrast, at the aggregation points, transport mechanisms from wireline, wireless, cable and other local access devices are often shared through interconnection agreements.

Figure 5. – Telecommunications and Broadband Landscape



Applications in Alaska

Given its unique rural nature, Alaska is ideal for the applications that broadband can provide. Listed below are prospective applications:

- Telemedicine – Most communities have some access to telemedicine in their community or nearby village. Federal programs have begun pilot programs that have shown promise are eligible for funding through Medicare and Medicaid, under the auspices of the TeleHealth Improvement and Modernization Act of 2000.

- Distance Learning – An application still being developed and enhanced that has been enabled by federal monies and allows the rural communities to keep current with educational needs. For example, courses in the University of Alaska's Center for Distance Education program are delivered through the Internet, email, as well as other media.

- eCommerce – Alaskans shop from catalogs and the television to a substantial degree. The Internet brings provides residents with new ways to shop and obtain goods and services. In many cases, the Internet might be the only feasible means for Alaskans to get a particular item.

- Distant Work Programs – Other countries have set up remote centers and train citizens to develop software, as the Internet decreases the importance of location for certain types of work. Similarly, members of some Alaskan rural communities are undertaking systems programming projects.

- Revenue Generating Business – One rural community in Alaska has been set up with broadband telecommunications and has initiated a business of selling their tribal masks over the Internet. This business has become very profitable for the rural community; related opportunities become feasible in Alaska if local broadband access is increased.

While an estimated annual population growth rate of 3%[30] suggests a modest growth in the demand for telecommunications services, this masks a number of issues:

- Underserved nature of many rural Alaskan communities.
- Economies generated from new technologies.
- Potential for above average use of telecommunications by bush residents – as evidenced by the fact that Alaskans' use of telecommunications technologies is higher than the national average, higher even than other rural states.

Data indicates that 64.8% of households in Alaska have computers (national average is 51.0%) and 55.6% have Internet access (vs. 41.5% of the U.S.).[31] Of course this must be balanced against the very small populations of many Alaskan villages.

[30] Alaska Department of Administration
[31] Statistical Abstract of the United States

Although cable companies such as GCI and AT&T have not yet offered telephone service over cable on a widespread basis, the reasons appear to center around the need to upgrade cable systems and work out the remaining kinks in the service offering. Implementation of voice service appears inevitable as the cable market coverage reaches saturation and providers look to expand service into new product areas, which is applicable to the 90% of homes in Alaska passed by cable.

In addition, geostationary satellite services now have not only the ability to provide extensive programming that competes with cable television, but also to offer high speed Internet access.[32] Further, if digital (or VoIP) telephony becomes available over twisted pair copper, then broadband providers may be able to offer voice, data and video services without the use of expensive Class 5 switching equipment, which ILECs often maintain in their asset base.

The promise of convergence, much like standard protocols, is that multiple providers can offer more overlapping, and thus competitive, services in less densely populated markets such as rural areas. Part of the promise of the 1996 Act is the emergence and adoption of new applications – one or more killer apps.[33] The World Wide Web – a user-friendly interface to Internet content – is one such application. Others, such as telemedicine and digital voice show promise. Still others are can be expected in the coming years or decades, and successful telecommunications carriers will be alert to all of the possibilities.

Pubic Policy Players in Alaska

The State of Alaska has been active over the years in advancing policy goals at the national level. For example, the State played a key role in the FCC's decision regarding the rate integration requirement of Section 254(g) of the Communications Act of 1934. Rate integration or rate averaging is a key issue for Alaska because it requires interstate telecommunications carriers to provide long distance services to their customers in each state at rates no higher than those they charge to their customers in other states. This ensures that consumers in Alaska continue to have access to interstate, interexchange services at affordable, nondiscriminatory rates.

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[32] While Low Earth Orbit (LEO) satellite services are also available, their use tends to focus on commercial, military or maritime applications. Data rates are very low, no more than 10Kbps. Handsets alone cost $900 and up, with per minute charges ranging from $0.89 - $1.50. Primary providers are Iridium, OBRCOMM, and Globalstar – their financial viability, given the high costs of launching LEO systems, remains in question. Source: Demko, John, Jia Hongli, Chris Schlak and Linh Tran. "LEO Satellite Services – Can a Startup Provider Survive", *Capstone Proceedings Paper* (December 2001).

[33] The widespread adoption of new technologies has been linked to the introduction of a "killer app" or "killer application". A killer app is a good or service that establishes an entirely new category. One example is VisiCalc, the first popular personal computer spreadsheet application (later overtaken by Lotus, then Excel) that was one of the initial catalysts for the widespread adoption of PCs. Another killer app is probably HBO, which was an early catalyst to the widespread adoption of cable. More generally killer apps have been defined to include the Model T, steam engines, the cotton gin, the compass, and the Welsh longbow, used to withering effect on the French by King Henry at Agincourt in 1415.

The Executive Branch, including the Governor's Office in Washington, DC and the Alaskan regulatory bodies have pressed Alaska's case on a variety of fronts. The State helped craft the DBS (Direct Broadcast Satellite) Part 100 rewrite, where the FCC streamlined and consolidated service rules in order to speed delivery of satellite television services to Alaska. Also, the State's petition for a waiver of the E-rate rule (only Alaska has been granted such a waiver) enables residents to use public school facilities during off-hours for Internet access.

Input by the APUC was instrumental in recommendations by the Federal State Joint Board on Universal Service in 1996[34] to grant explicit authority to the State regulatory body to order common carriers to provide services to unserved communities.[35] More generally, the inclusion of many of the universal service provisions in the Telecommunications Act of 1996 was a direct result of the efforts of Alaskan legislators and policymakers.

Executive Branch

The Executive Branch has the ability to be an advocate at the federal level for Alaska's communication issues. Views held by the White House, the Congress and the myriad federal agencies – particularly the FCC – play an important role in shaping the formation of telecommunications policy that will ultimately affect Alaskans. At the state level, the governor is responsible for nominating RCA commissioners for six-year terms, subject to confirmation by the Alaska Legislature. In addition, the Governor's office manages state agencies and oversees procurement.

As a policymaker, the governor has leverage on two fronts. On the one hand, the governor's office controls the administrative apparatus of the state. The office is ultimately responsible for enforcement of the laws and statutes. In addition, the governor makes regulatory, administrative and judicial staffing decisions through political appointments. As with judicial appointments, the governor's choices for the RCA can influence the tenor and direction of the commission.[36]

On the second score, as the chief executive, the governor holds the bully pulpit in Alaska. The governor is in the best position to set legislative agendas – or at least attempt to frame them – and to establish administration priorities. The governor can also shape the State's administrative structure so that certain issues are given priority. A focus on universal service in Alaska by the governor in the early 1980s is one example.

More recently, there have been efforts by Lt. Governor Fran Ulmer to undertake eGovernment and systems consolidation initiatives. Lt. Governor Ulmer chairs the Telecommunications Industry Council (TIC), which established policy goals of improving public access to government information, using advanced technologies to maximize

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[34] Federal State Joint Board on Universal Service FCC 96J-3.
[35] 47 U.S.C. § 214(e)(3).
[36] Examples of how the institutional context can influence policy outcomes can be found in: Cooper, Joseph. "Institutional Context and Leadership Style: The House from Cannon to Rayburn", *The American Political Science Review* 75 (1981) pp. 411-425; Eisner, Marc and Kenneth Meier. "Presidential Control versus Bureaucratic Power: Explaining the Reagan Revolution in Antitrust", *American Journal of Political Science* 34:1 (February 1990) pp. 269-287.

services to the public and optimizing government efficiencies. The TIC is also well positioned to act as a liaison to Alaskan stakeholders on matters of federal telecommunications policy, and the potential impact to the State.

Now that transitional deregulation has been in place for about six years since the passage of the Telecommunications Act of 1996, some issues are becoming clearer. The Internet, for example, once seen as everything from a toy, to the harbinger of world peace, is now being understood for what it is – a technology enabler that can improve and widen the experience of citizens in a variety of venues: education, healthcare, commerce, as well as active participation in government. Leadership in the Executive Branch can help bring this point home and initiate action at the federal level. If the federal government expands the definition of universal service to include information services such as the Internet, it will provide support to high cost areas in Alaska that do not currently qualify for support under the 1996 Act. The Governor's office and administrative organization can play a significant role in influencing events in this area.

Governor's Office in Washington, DC

In addition to managing the administrative resources within the State, the Governor of Alaska also has an office in Washington, DC that works with federal officials in an ongoing capacity. The Governor's Office in Washington, DC has been involved in telecommunications policy at the federal level for over two decades. Its primary role in this area is to represent the interests of the State in legislation before Congress (including the Telecommunications Act of 1996) and in rulemaking and other proceedings before the FCC. In performing this task, the office works closely with other parts of the Administration, including the Lt. Governor's Telecommunications Information Council (TIC) and the Departments of Law, Administration and Education, and the Congressional delegation. It also regularly consults the RCA and relevant private interests, including telecommunications carriers serving Alaska.

Among the key FCC proceedings in which the State (through the Governor's Office) has been active are:

(1) the Federal State Joint Board proceeding addressing the Alaska long distance market structure;

(2) the Federal State Joint Board on Separations;

(3) the rulemaking on rate integration and geographic rate averaging for interexchange services, including application of these requirements to wireless carriers;

(4) various rulemaking proceedings on the FCC's rules for universal service including (a) the original 1996 rulemaking, (b) the 1999 Notice of Proposed Rulemaking addressing unserved and underserved areas, (c) the 2001 State petition for waiver of an E-rate rule to permit community use of E-rate supported facilities, and (d) the 2001-2002 reexamination of universal service; and

(5) the direct broadcast satellite rulemaking addressing the requirement for DBS service in Alaska and Hawaii.

In each of these proceedings, the Governor's Office has sought to inform the FCC of the differences between Alaska and most other parts of the United States. It has sought to promote and protect the universal service programs that support telecommunications services in Alaska, to keep interstate long distance service rates at the same level as in the rest of the U.S. and to promote the availability of Internet access through the rural areas of the State.

Legislature

The Legislature sets policy for intrastate communications, and approves appointments to the RCA. It has oversight responsibility, and may hold hearings to inquire into the actual implementation of law. Based on its findings, as well as input from constituents, it may craft new law or modify existing statutes in order that its intents are clarified.
States may adopt statutes and regulations relating to telecommunications services, as long as they are consistent with the 1996 Telecommunications Act.

State Regulators

State regulators have an important role in telecommunications policy, and maintain significant authority by the FCC and the 1996 Telecommunications Act. As the state regulatory commission for Alaska, the RCA has the power to make decisions regarding rates and tariffs for carriers operating within the State.

The 1996 Act provides state regulators with the authority to rule on ILEC rural exemptions. For example, unlike RBOCs, rural ILECs are exempt from requirements to interconnect with or make unbundled network elements (UNEs) available to competitive carriers. However, if an exemption is not granted, ILECs must then provide these services to CLECs, and the RCA has the authority to arbitrate pricing if the carriers cannot reach agreement on their own. If the state or state commission does not fulfill the function, the FCC has the authority to preempt jurisdiction.

A recurrent theme throughout the 1996 Act is that state commissions (e.g., the RCA) may not prohibit entry of telecommunications carriers into markets. The RCA also has the ability to designate local exchange carriers as eligible to receive High Cost and Low Income universal service funds in the form of granting ETC (Eligible Telecommunications Carrier) status, which it has done in some markets in Alaska. State commissions also have the ability to require carriers to provide service to unserved communities and assign ETC status to one or more carriers as part of that process.

Other states are struggling with the evolving nature of telecommunication and the appropriate degree of involvement. Public-private initiatives are often undertaken (see Appendix I for specific examples in the U.S. and Canada). Regulatory bodies in rural states are addressing decisions such as intrastate industry consolidation and whether to grant ETC status to wireless carriers. Additionally, thirteen rural states have established an OSS (Operational Support System) collaborative to facilitate the use of Qwest computer systems, databases and personnel by competitive carriers.

Texas has implemented guidelines concerning universal service fund reimbursement for voice-grade telecommunications service to uncertificated areas of the state. This rule is expected to improve the provision of local telephone service. Further, if federal funds become available for uncertificated areas in the future, the state will already have a consistent provision in place for such support. The plan is considered to be competitively neutral, because it is portable, and because both wireline and wireless carriers are eligible for funds.

Alaska Telecommunications Issues and Regulation

Natural Challenges Facing Telecommunications Carriers in Alaska

Alaska consists of a staggering landmass – more than twice the size of Texas – and is rugged and challenging on many levels. The State covers 615,230 square miles (land and water), 58% of which is federally owned. Alaska's footprint is also surprisingly dispersed: a trip by air from the state capitol in Juneau to Attu (on the western end of the Aleutian Peninsula) is over 2000 miles – two-thirds the distance of a transcontinental flight from New York to Los Angeles.

Alaska has approximately 53 active volcanoes, mostly along the Aleutian Peninsula. Some volcanoes are also found near the population centers of Anchorage and the Kenai Peninsula. Three of the ten largest earthquakes recorded worldwide since 1904 have occurred in the Alaskan region. The most seismically active areas are on or around the Aleutian Islands and the south central regions of the state. River settlements and coastal areas are subjective to flooding. Wildfires in the interior are not uncommon, but are part of the natural ecology and combated only when they threaten human life, property, or valuable natural resources.

Population, Industry, Infrastructure

From the first census in 1880, the population of Alaska grew gradually until the end of World War II, where it remained at under 100,000 inhabitants. However, after statehood in 1959, Alaska's population grew more rapidly. Currently Alaska has about 650,000 residents and is growing steadily. Key exports are seafood, petroleum, timber and other minerals.

The most populous areas of the state are the major metro areas (Anchorage, Fairbanks, Juneau), and more broadly, the southern and coastal regions. Native populations tend to be clustered in the northern and western sections of the state. Most of the settlements throughout the state are along rivers or coastal areas.

The state has limited heath care facilities licensed or certified by the State of Alaska. However Alaskans also obtain health care from private physician offices, birth centers, home health agencies, outpatient clinics, nursing homes and other sources. Alaska has three international airports and approximately 24 certified airports, which can accommodate aircraft with more than 30 passengers.

Federal employment is most significant in the central and south central regions. The federal government owns approximately 58% of the land; 29% is owned by the state; 12% is owned by native corporations and about 1% is privately owned. Federal lands include national wildlife refuges, national forests, natural petroleum reserves, as well as recreational and conservation areas.

History and Landscape of Telecommunications in Alaska

Early Deployments

In many ways, Alaska is a dichotomous state. On the one hand, it has metropolitan areas such as Anchorage, Juneau and Fairbanks. Conversely, the State has a large number of rural communities consisting of less than 1000 people. The population of the State is approximately 627,000 – only Wyoming, Vermont and the District of Columbia have fewer people. Yet the State's landmass alone covers 570,374 square miles, over twice the size of the next largest state.

While early deployments of long distance telephone service in rural Alaska consisted of limited use of high-frequency land radio stations (VHF radio systems), a new C-band satellite earth station technology became feasible in the mid-1970s, which still dominates the State's rural telephone infrastructure today. This type of infrastructure differs considerably from the fiber and microwave long distance technology most often employed in the contiguous 48 states. Extreme distances and mountainous terrain often separate rural Alaskan communities, and only a small percentage of Alaska's communities are connected by rail or highway, which typically supply the rights of way, and often the means for both microwave and fiber optic runs. While terrestrial lines are used in the State where economically feasible, much of Alaska's long distance service is availably only through ground station satellite links

Alaska's telecommunication landscape has changed substantially over the past three decades. As recently as the 1970s, most Alaskan bush communities had no telephone service. However starting with the leadership of Governor Jay Hammond from 1974-82, Alaska made universal service a priority. Local telephone service penetration for basic voice in Alaska is now at 96% - a percentage point above the average for the lower 48[37] – and up from about 80-85% over the past two decades.

In 1981, Governor Hammond issued an executive order consolidating the State's telecommunications functions in a single department, establishing the Office of Telecommunications, with appointees taking an active role in the industry at the consumer, business and government levels. The goal was to facilitate telecommunications management, foster planning, provide assistance to State agencies and departments, and ensure that impacts on the private sector were evaluated before the State government took major actions related to telecommunications.[38]

The Emergence of Competition in Alaska

Until 1982, Alascom (now AT&T Alascom) operated the only long distance network in the State. In 1982, GCI entered the competitive long distance market in Alaska. ACS is the largest local service provider in Alaska, and also offers long distance, cellular, data and Internet services. ACS was formed in 1998 and consists primarily of former

[37] FCC. "Telephone Subscribership in the United States (May 2002).
[38] Hills, Alex. "Alaska's Giant Satellite Network", *IEEE Spectrum*, 20:7 (July 1983), pp. 50-55.

CenturyTel and Anchorage Telephone Utility (ATU) facilities. According to the company's 10K report for 2001, ACS currently maintains approximately 68% of the access lines provisioned in Alaska.

In 1997, both Alascom and GCI initiated local service competition in the Anchorage market. Alascom has approached the market by reselling ACS services; GCI has focused on UNE interconnection with ACS.

Section 253 of the 1996 Telecommunications Act requires that no state law or regulatory body prohibit market entry of any telecommunications carrier. Further, carriers of last resort (COLRs) can also be compelled by state regulatory agencies to provide service to local subscribers in a given exchange.

A key development in the State's telecommunications environment occurred in 1999, when the Alaska Public Utilities Commission (APUC) removed the rural exemption for ACS in Fairbanks and Juneau. The APUC's successor, the Regulatory Commission of Alaska (RCA) sustained that ruling, and as a result, ACS was then required to lease elements of its network to competitors seeking to offer local exchange services. GCI initiated local service in Anchorage in 1997, Fairbanks in 2001, and Juneau in 2002.

Removal of the rural carrier exemption also enables a CLEC to obtain USF support in high cost areas. The upshot is that High Cost and Low Income program support becomes portable from the ILEC to the CLEC, even if the CLEC uses ILEC facilities for last mile connectivity.

The rural exemption is currently applicable to all Alaskan communities except for Anchorage, Fairbanks and Juneau. The remaining rural ILECs in Alaska retain their rural exemptions, as does ACS in the other markets in which it operates. For ACS, its status as a carrier is now somewhat similar to the regional Bell companies that it must lease UNEs at rates often mediated by state PUCs. In the case of Alaska, the RCA must arbitrate UNE rates if ACS and competitive carriers cannot reach agreement of their own accord. The ruling also makes High Cost Support funding portable in affected markets and enables competitive carriers to receive a portion of them. In Fairbanks and Juneau, for example, GCI receives USF support based on the price it pays to ACS for UNEs, multiplied by the number of customers in those markets it signs up for service.[39]

GCI has obtained ETC status in Juneau, Fairbanks and Fort Wainwright, which is a prerequisite to qualify for High Cost USF support. The status of other communities with regard to rural exemptions, ETC and portability of support remains subject to future RCA or other State regulatory rulings, based on requests by prospective entrants.

[39] ACS receives High Cost USF based on embedded costs, which are currently higher than the rates at which it must provide UNEs to competitors. For GCI's local service customers using ACS facilities, ACS receives the difference between the UNE price and the High Cost USF support.

Regulatory Questions

Whether removing the rural exemption in other exchanges in Alaska will result in competition beneficial to consumers is not clear. Where rural exemptions are not applicable, the Telecommunications Act of 1996 has led regulators to pursue two simultaneous courses of action – requiring RBOCs and some other ILECs to interconnect with competitive carriers *and* simultaneously establishing pricing below actual incurred (embedded) costs for the use of shared network elements. This approach is, in effect, a two-pronged strategy for opening markets to competition. Instead of simply requiring interconnection (at cost, as opposed to forward-looking, hypothetical pricing), the tactic potentially imposes a financial burden on incumbents, and may inadvertently prop up competitors at the same time. It is not clear to what degree such a method is unnecessarily aggressive, and perhaps even unsustainable for both ILECs and CLECs.

However, it is also important to make a distinction between universal service funding and the presence of competition. Even in communities that receive High Cost USF support, the entry of competitor(s) into an ILEC territory does not necessarily imply inefficient or fully duplicative infrastructures. New competitors that provide local telephone service to a market may offer other services that the ILEC does not. As a result, entry by a competitive provider does not signify the continued inevitable division of a finite pie.

Competition can stimulate demand for new services and/or lower prices because of increased pressures on incumbent carriers to become more efficient. Competition does not represent the end of USF funding. Nonetheless, support from universal service programs that tax carriers or consumers on a proportionate basis is quite different from regulatory subsidy of newer competitors at the expense of incumbents.

Key Provisions of 1996 Telecommunications Act Relevant to Alaska

Removing Barriers to Entry into Local Exchange Service

The landscape of the telecommunications industry in Alaska is as complex and vast as the State's geography. Few comparisons can be made with other states in the lower 48. For example, there is a great deal of competition in Anchorage, and inroads are being made in Juneau and Fairbanks. In Anchorage, GCI has approximately 40% of the local dial tone market. This type of competition for local service by a CLEC is unique to Alaska. However, the degree to which it is sustainable, given the use of below-cost UNE pricing as a means of encouraging competition, or at what point regulators cede control to the market are open questions.

Perhaps ironically – because of its largely rural character that many competitive telecommunications carriers might find less attractive – Alaska has produced a competitive environment that, at least so far, has given consumers in the relatively urbanized areas a choice of local providers. In the case of GCI, its success is due in part to taking an incremental approach to its build-out of service areas. The company's strategy has been to establish a presence in one central office at a time, and maintains an eye toward profitability as it builds out its coverage of a particular geographic area.

This incremental approach stands in stark contrast to many of the CLECs in other parts of the country following the passage of the 1996 Telecommunication Act. Many CLECs, such as Northpoint and Rhythms entered local markets with the express purpose of gaining share, and with the tacit approval of investors, while downplaying any real emphasis on near term profitability. Appendix II provides some discussion about successful approaches by entrants in a newly deregulated, capital-intensive industry.

In spite of the assistance provided to CLECs by the FCC over the past few years to attempt to foster competition, the success or failure of competitive providers appears to have centered more on effective strategies than regulatory support. It may be that the ultimate benefits from competition and deregulation may come more deliberately, even ploddingly, than first anticipated.

The Telecommunications Act of 1996 was intended to promote competition that would result in lower prices and improve services, as had occurred with long distance. However, many believe that the benefits from competition are not coming to rural areas quickly enough. It is important to note that the unhurried forays by competitors into rural markets suggest that these areas would be only marginally attractive or altogether unprofitable for competitors. As a result, competition alone may provide no panacea. Development and commercialization of technologies will probably be required as well, although the presumption is that this is more likely in an atmosphere of competition anyway.

The levels of debt will continue to plague the industry for some time to come. It is possible that both the large incumbent local exchange providers and cable companies will have difficulty attracting capital for further infrastructure build-outs in the foreseeable future. Nonetheless, new applications will continue to emerge that will lower costs,

make new services available, and ultimately drive organizational and institutional restructuring – with implications for society at-large.

Universal Service (USF)

As an aspect of pubic policy, universal service has been subject to two significant turning points regarding its definition. Initially, universal service was about standards for interconnection of devices between carriers.

Prior to 1913, customers had to use or own multiple telephone devices to reach callers in other exchanges who were served by competing carriers, yet little or no value was added by having differing interconnection standards. The initial definition of universal service was more akin to new economy terms such as network effects or increasing returns[40], where the value of a system, network or product increases as more people use or have access to it.[41]

In order to address increased interest by antitrust officials at the Justice Department, AT&T agreed to be regulated as a monopoly in return for its commitment to interconnect with the remaining local exchange carriers throughout the country that it had not already acquired. AT&T's slogan, which typified early characterizations of universal service, was: One Policy, One System, Universal Service.

The second major turning point in defining universal service occurred with the passage of the Communications Act of 1934, which included in its charter "to make available, so far as possible, to all the people of the United States a rapid, efficient Nationwide, and worldwide wire and radio communication service with adequate facilities at reasonable charges." The 1934 law had the result of expanding the definition of universal service to include the provision of reasonably priced basic service to all citizens.

Finally, with the passage of the Telecommunications Act of 1996, universal service has once again become the topic of some debate, if only because its sources of funding are more and more visible to consumers. Further, uncertainty remains about whether to expand the scope of USF support in the High Cost or Low Income programs to include advanced telecommunication or information services, or to establish additional programs such as the Schools/Libraries and Rural Healthcare programs.

USF takes a variety of forms, including support to low-income subscribers, as well as support for relatively high cost areas of the country. For the most part, USF support is limited to basic telephone service. Prior to the passage of the 1996 Telecommunications Act, the Congress was divided on whether to include information services such as the Internet into the USF designation, and the decision was ultimately made not to do so, if only because the long term impacts of the Internet were still not fully understood. As a compromise, the E-rate fund was established to subsidize Internet connections to schools, libraries and health care facilities.

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[40] As opposed to diminishing returns, typical of traditional manufacturing environments and standard Economics texts.

[41] The Microsoft Windows operating system and the Internet are usual examples.

Alaska's share of the E-rate (Schools and Libraries) and Rural Health Care funding appears a relatively modest portion of the total, which stands at approximately $12 million annually. By comparison, California received $267 million, New York $207 million and Texas $100 million. Overall, Alaska ranks 33rd in terms of combined E-rate and Rural Health Care funding distributed to the states.

Federal universal service support programs are funded by providers offering interstate and international telecommunications services. This list includes long distance companies, local telephone companies, wireless carriers, paging companies, and payphone providers. Providers pay into a central fund, which the Universal Service Administrative Company (USAC) administers.

The amount of contribution by carriers is roughly 7 percent of a provider's billed amount for interstate and international telecommunications services. It is adjusted quarterly in accordance with projected telecommunications revenues and universal service demands. Carriers are not required to detail USF contributions on customer bills, although most do. However, when carriers initially began detailing USF charges on customer bills, the resulting controversy caused the FCC to attempt to discourage the practice, at least for a time.[42]

Distribution of USF funds takes several forms, and a short review is provided below, which includes the amounts received by the State. Currently, most support is paid directly to eligible carriers; however E-rate support may be paid to schools or to carriers or non-carrier providers of covered services. Payments to consumers, similar to school voucher or food stamp programs have not been used for telecommunications services to-date.

- Low Income Program
  - LifeLine: Monthly subsidy for basic telephone service for low-income households. Annual support total approximately $560,000 to Alaska.
  - Link-Up: Discounts on basic telephone service hook-ups for low-income households. Annual support total approximately $16,000 to Alaska.
- High Cost Program
  - Provides financial support to eligible telecommunications carriers that provide basic telecommunication services in areas where the cost of providing service is above average. Current annual support to Alaska is approximately $78 million.
- Schools and Libraries Program (E-rate)
  - $8.5 million in annual support to Alaska.
- Rural Health Care
  - $3.5 million in annual support to Alaska.

[42] Black, Sharon K. *Telecommunications Law in the Internet Age*, Morgan Kaufmann Publishers: New York (2002).

In addition to the USF programs outlined above:

- Federal Grants
  - As an example, the State, with the assistance of the RCA, recently obtained $7.5 million to fund infrastructure for rural communities not currently online. By comparison, while Lifeline and Link-Up subsidize service that is currently provided, they do not address broadband infrastructure issues directly.

The intrastate rate averaging in Alaska is by far the lesser half of the State's sources for universal service funding, totaling only about $1.8 million. This pool of support is collected from virtually all State telecommunications providers[43], and is distributed to rural local carriers with high switching costs (68%), and to support Lifeline (28%).[44]

[43] For example, cellular, PCS, mobile radio, local, long distance (See 3 AAC 53.340).
[44] Source: Regulatory Commission of Alaska. The remaining 4% pays for the fund administration.

State Role in Promoting Cost Effective Delivery of Telecommunications Services in Alaska Consistent with Policy Objectives

Universal Service of Basic and Advanced Telecommunications Services

The Universal Service section of the Telecommunications Act of 1996 indicates that the goal of the Congress is to promote the availability of quality services at just, reasonable, and affordable rates; increase access to advanced telecommunications services throughout the nation; advance the availability of such services to all customers, including those in rural, low-income, insular, and high cost areas, at rates that are reasonably comparable to those charged in urban areas.

Additionally, the Act requires all providers of telecommunications services to contribute to federal universal service in an equitable and nondiscriminatory manner. The law prescribes that there should be specific federal and state mechanisms to preserve and advance universal service. The Act also requires that the Federal-State Joint Boards and the FCC should determine those other principles that, consistent with the Act, are necessary to protect public interest.

Federal Support to Alaska

As outlined previously, Alaska receives approximately $78 million a year to support local telephone service in high cost areas, which in turn enables providers to offer below cost monthly rates to subscribers. The E-rate (Schools and Libraries) Program provides another $8.5 million annually, and the Rural Healthcare Program provides $3.5 million in support to schools, libraries and health facilities in Alaska. These substantial transfers help maintain the viability of telecommunications services to Alaskan communities.

The USF programs are not the only sources of funding for telecommunications infrastructure. In addition to the previously mentioned programs, the State recently received approval for $7.5 million in grant money from the Department of Agriculture in order to fund infrastructure development in rural communities for Internet access. The RCA will administer the distribution of the grant money to be transferred from the Department of Agriculture. This is significant, because currently the only other funds available for Internet access infrastructure development are from the E-rate program.

Alaskans have benefited significantly from the fund in terms of development of infrastructure. One of the side-benefits of the E-rate program is that it may lead to the introduction of new telecommunications infrastructure in rural communities. Typically, this infrastructure provides for greater interexchange bandwidth than existed in that community in the past.

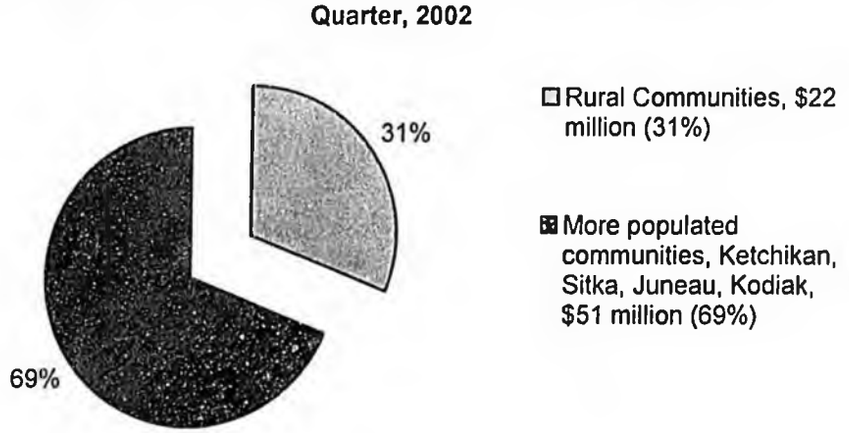
Where this occurs, it has two benefits. First, the State obtained a waiver from the FCC's rules to allow others to use the schools' E-rate supported services during non-school

hours subject to certain conditions.[45] Second, the new infrastructure may not be fully utilized by the schools or libraries. It thus may allow the carrier to provide other services to the community. So, for example, GCI now has a point of presence in many communities that can support further build-out of local service facilities.

The other USF funds, including the estimated $78 million from the federal level in the form of high cost support, are applicable only to traditional telephone service. The 1996 Telecommunications Act does not provide support to rural or high cost LECs for Internet or high-speed data services such as DSL.

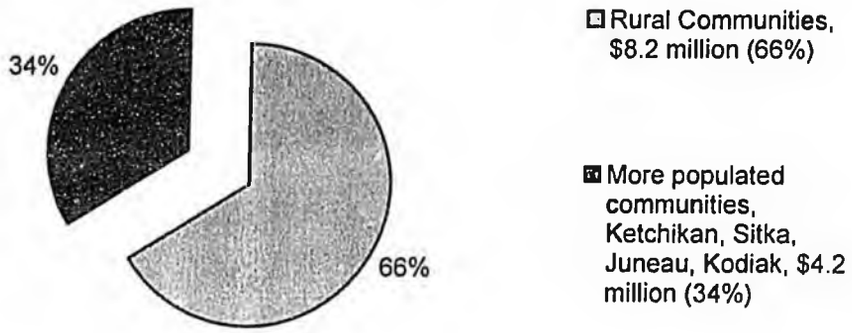
The four different programs within the category of Universal Service Funds (USF) are important because of their contribution to the development and maintenance of the telecommunications infrastructure to the rural communities of Alaska. The following information from the RCA illustrates how much the Universal Service Fund actually contributes to Alaska. The charts below depict the amount projected to be distributed in the third quarter of 2002, as well as the amount of funding provided for medical facilities and schools in the year 2000.

Figure 6. – USF Programs

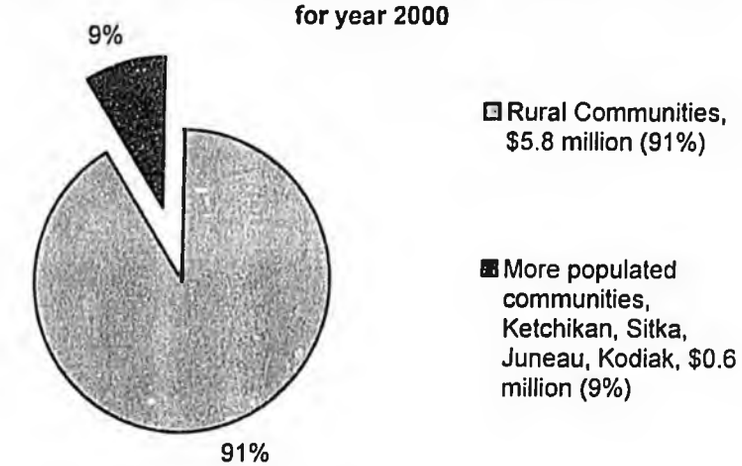


[45] FCC - CC Docket No. 96-45.

Universal Service Fund Distribution for Schools and Libraries in the year 2000



Universal Service Fund Distribution for Rural Health Care, for year 2000



As can be seen, the rural areas are greatly dependant upon the Universal Service Funds, not only for basic telecommunications needs, but also the interconnection of schools, libraries, and medical facilities to the Internet and each other. If any substantive policy changes are made at the federal level regarding the fund, telecommunications services support to rural Alaska could be impacted, either positively or negatively. The opportunity for Alaskan policymakers is to press the State's case nationally and propose innovative solutions regarding the need to support the extremely remote, rural areas unique to Alaska.

As of July 9, 2002, the Federal-State Joint Board on Universal Service recommended retaining the existing list of services,[46] which excludes Internet access beyond the E-rate program, but also provides additional time to make a prudent determination on what should comprise essential service access.

[46] Federal-State Joint Board on Universal Service. CC Docket No. 96-45, Adopted July 9, 2002.

Shared Goals, Expanded Scope

The 1996 Telecommunications Act provides support for basic local service in high cost areas and to low income households to achieve universal service (as defined as the provision of basic local service to the widest possible number of customers). However, the Act imposes the requirement that the support must be provided in a transparent (i.e., explicit) manner and that support be collected in a competitively neutral manner. Thus, current telecommunications law is charting a course to eliminate the subsidization of universal service through traditional methods, at least at the federal level, such as high access charges imposed on long distance carriers.

The Executive Branch and the RCA should continue to engage federal authorities to advocate for stable sources of funding for federal universal service support programs: High-Cost Support, Low Income (LifeLine, LinkUp), E-rate (Schools and Libraries Program), Rural Health Care Program. Further, the Executive Branch and RCA should engage federal authorities to increase the scope of universal service to encompass advanced services in a competitively neutral manner, given the increasing importance of these services to commerce, education, healthcare and lifestyles.

In addition, it will be important for all parts of State Government to work together to assure adequate funding from appropriate sources for universal services administered by the RCA or other state commission. While Alaska is a diverse state, with competing interests on many issues, federal support for programs that contain a telecommunications component will have a positive impact throughout the State. Broad alliances should be encouraged so that the State speaks with one voice on this matter, regardless of political party or regional affiliation.

Toward that end, Alaskan administrators, legislators and regulators should continue to search aggressively and promote both alternative sources of funding for telecommunications infrastructure and services, as well as innovative applications of advanced technologies to traditional public policy concerns: healthcare, education, environmental protection, quality of worklife, consumer education, national security, participation in government, and commercial activity.

Appropriate Government Role to Ensure Competitive Neutrality and Consistent Service Delivery

Competitive Neutrality – Competing Definitions

Competitive neutrality defies a satisfactory definition. This is a function of the wide variation in how the 1996 Telecommunications Act has been interpreted. It is hard to find anyone who is pleased with either how the Act was written, or conversely, how the Act has been interpreted and enforced. The situation stems from the differing perspectives on how best to transition from regulated monopoly to a competitive environment, aggravated by the often – and intentional – vague language of the Act.

Much of the debate associated with competitive neutrality has to do with local loop access and pricing. Wireless competition, for example, has in the main proceeded well, and has been considered successful.[47] Similarly, there are large numbers of retail and backbone ISPs, despite recent industry consolidation. The fact that wireline competition in local service has not progressed as rapidly as wireless and Internet is almost certainly a function of its high costs and lower margins, particularly in relation to the large investment required for facilities. Also relevant is the comparative youth of digital technologies that, for example, are now making cable telephony feasible. Even so, physical transport of voice-only telecommunications services is typically a loss leader, and carriers attempt to make up the difference on additional value added services and bundles.

Competitive neutrality is becoming a fractious issue in the post-regulatory arena. Even the definition of competition – whether intermodal or intramodal – is a conundrum as technology continues to advance. Over years of regulated competition, ILECs have built up substantial assets bases, and the FCC has attempted to offset incumbent asset advantages by endorsing a policy of promoting competition through interconnection rules and pricing. Yet, critics argue that cable Internet services have overtaken DSL in terms of household adoption because of the regulatory burden placed on ILECs.

At this point, it is difficult to find systematic evidence about how best to proceed with telecommunications deregulation. Using long distance as a case study, the FCC provided a leg up to MCI and Sprint in order for them to compete against AT&T, which enabled the two competitive carriers to build out their networks over a period of years. Most people conclude that the outcome regarding long distance has been a successful one. On the other hand, there is increasing evidence that competition for broadband at the last mile is coming from other areas such as cable, and that artificially supporting intramodal competition through below-cost UNE pricing is counterproductive (see Appendix I. – Oklahoma Experience with Broadband).

Cooperative Solutions

Communities, municipalities and villages have more options than is sometimes acknowledged. They can in fact, either alone or in conjunction with state or federal entities, affirmatively act to introduce a new service where private industry has not yet done so. The State's decision in 1975 to fund the installation of a satellite long distance network is one example.

As another example, the McGrath Power Company in Alaska, established its own ISP by obtaining bandwidth from AT&T and using fixed wireless for local access. Serving a community of only 450 people, its operations broke even in 18 months, and the project was undertaken without the need for special funding or regulatory oversight.

Case studies in other states and countries, as well as the practical experience in many parts of Alaska, suggest that cooperative ventures between municipalities and telecom carriers can be an effective solution. Carriers tend to be more successful if they are active in the local community. Through shared goals and cross-community cooperation,

[47] Although service problems, such as dropped calls, or complicated calling plans are ongoing issues.

the social benefits implicit in widespread availability of telecommunication or information services can be realized. Particularly in Alaska, where rural communities are very small, adjacent communities should also look for opportunities to work together.

Successful regional ILECs have tailored their customer support functions to meet the needs of residents effectively, yet do so at a manageable cost. TelAlaska, for example, employs technicians that live in their service area, but cover multiple villages. Before they are dispatched to a customer site, the need for on-site service – an expensive solution – must be validated. Once the specific problem has been fixed, the technician also conducts an examination of facilities in order to identify and repair any items that may be likely to cause service outages in the future. This regional approach contrasts with that of larger ILECs, which often must dispatch technicians from farther away, and who will be less familiar with their customers and the local facilities.

The economies of scale that larger ILECs are able to achieve in more densely populated service areas may not be applicable to smaller communities. As a result, public policy that reflects these differences may encourage an equilibrium that often develops in such an environment – which is frequently a mix of both competition and cooperation. Local public and private entities, left to their own devices, are often able to craft workable, even optimal solutions, without the need for significant regulatory oversight.[48]

Role of Government – State and Federal

On yet another front, the Denali Commission has been tasked by the federal government to build out key portions of Alaska's rural infrastructure. While its focus during the three years it has been in existence has been on basic healthcare and energy facilities, the Commission has also performed a study on rural telecommunications and could potentially be tasked with additional work in that sphere should the need become apparent and funding appropriated for such activity. For now, the Commission appears to be waiting until the impact of current programs and competition can be evaluated.

As an aside, the Commission has also been involved with implementing water and sewer projects. One of the interesting aspects of this particular infrastructure build-out has been the significant use of local washaterias, even though many village residences now have water/sewer connections. Why? Immediate out of pocket costs for washers and dryers are one reason.

This situation brings up an interesting question: Is it optimal, particularly in the near term, for every home in Alaska to be wired to the Internet? Using the community washaterias as an example, it might be worthwhile to experiment with privately funded community technology centers, wired with broadband connections. Such a center would mean that consumers would not have to purchase computers and necessarily incur monthly fees for access to the Internet. Technical maintenance issues could be more easily and economically resolved, and it would extend benefits of the Internet, such as State eGovernment services to a wider percentage of the community. As the State looks to initiate new eGovernment initiatives, it must consider whether rural residents will have reasonable access to these automated services. Community technology centers

[48] Coase, Ronald. "The Problem of Social Cost", *Journal of Law and Economics* 3 (1960) pp. 1-44; Cheung, Steven N.S. "The Fable of the Bees: An Economic Investigation", *Journal of Law and Economics* 16 (1973) pp. 11-33.

could aid efforts to establish partnerships with academic institutions as well because of the potential to augment the central facilities with equipment or resources. In addition, such centers might help maintain a sense of local identity that sometimes attenuates with the adoption of new technologies in the home such as television.

Local involvement by municipalities as stakeholders – as opposed to a reliance on regulators – presents a different dynamic that has shown promise in many communities in Alaska. In addition, public ownership of assets is often a temporary or transitory state of affairs. There is ample precedent for the transfer of publicly owned assets to private investors in Alaska, as well as the rest of the U.S.

The demise of many large CLECs in the past two years is instructive. Their failure to bundle services in order to offset the high costs of basic access was one of the proximate causes of their bankruptcy. Higher margin, value added services such as VPN and network management for DSL services, for example, would have improved quality of service (QoS) and enabled CLECs to differentiate themselves from established carriers.

Even with the overt support to competitive providers by the FCC and state regulatory bodies[49], the success of competition in the past few years has been mixed. While federal and state agencies appear to have adopted the interpretation that competitive neutrality implies actively assisting entrants to gain a foothold, such efforts to engineer competition are not necessarily neutral and may not be tenable in the long term. Attempts to coax competition, for example, may have contributed to the over-investment and overbuilding in the years following the 1996 Act. Experience in other deregulated industries suggests that entrants who endure do so because of differentiated business strategies, and need only for regulatory agencies to allow competitive access.

Appropriate Levels of Regulation to Encourage Industry to Work Toward Policy Goals

Interpretation of the 1996 Telecommunications Act

Policymakers continue to gauge the manner in which the FCC has implemented the 1996 Telecommunications Act. The success in the long distance markets nationwide, where per minute rates fell from $3.00 to less than 10 cents is an oft-cited example of the success of competition. This point of reference frequently informed the drafting of the 1996 legislation.[50]

Prior to 1996, state regulators had virtually full regulatory authority over the provision of local telephone service, usually in the form of franchise monopolies – i.e., only one local provider per service area. The Telecom Act of 1996 changed the regulatory division of responsibility in ways that have taken the FCC and state regulators some time to sort

[49] Huber, Peter W., Michael K. Kellogg and John Thorne. *Federal Telecommunications Law, 2nd Edition: 2002 Cumulative Supplement*, Aspen: New York (2002).
[50] Black, Sharon. *Telecommunications Law and the Internet Age*, Morgan Kaufmann: New York (2002), p. 56.

out. The change in the law as a result of the Act has, to some extent, left unclear the role of public utility commissions with regard to telecommunications regulation.

There is still substantial difference of opinion regarding the interpretation of the 1996 Act. Coupled with the wide latitude typically given federal and state agencies to enforce administrative law – consistent with the Chevron Doctrine – public policymakers have often struggled with the nature and degree of their involvement in establishing a framework for competition. While much of the Act's enforcement remains with the statue regulatory commissions, the FCC has become more active in establishing policy at the local level. As a result, deregulation over the past six years has been a joint effort by regulators at the state and federal levels, but with some ambiguity.[51]

In many ways, under the Act, the role of the RCA is to implement federal policy, as well as to implement state policy. Policy can reduce industry's incentives to invest in infrastructure; so regulators seeking to promote infrastructure development should take steps to assure that those who invest in infrastructure have the opportunity to reap economic rewards that are necessary to justify the investment.

The Road Ahead

Since the Act does provide the FCC with wide discretion, which the Supreme Court has upheld[52], Alaska's policymakers and the RCA would be well served to continue to focus efforts on educating the federal commissioners and attempting to ensure that the State's unique characteristics are reflected in policy. Other states are classified as rural, but no other state has the dispersion of residents that Alaska does. It is doubtful that many policymakers from outside the State appreciate the extreme geographic separation of villages and communities in Alaska.

It is always difficult to read the tea leaves, but it appears that the FCC is moving toward an approach that punishes RBOCs more severely for violations of existing policy, while at the same time limiting the institution of any new regulatory demands for RBOCs or ILECs. The implication is that further regulation on any wireline data services such as DSL appears unlikely. Once VoIP over local telephone lines is widely available – which may be classified as a data product because of packet switching – the nature of telephone regulatory policy may require significant revision in order to address universal service funding. Explicit support may become even more critical, as will the need for support for new initiatives at the federal level by Alaskan policymakers.

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[51] For example, after Qwest had reached an agreement to acquire USWest in 1999, final approval was required not only from the FCC, but also from the individual state public utility commissions. After the proposed combination was announced, several PUCs in rural states where USWest operated, appeared inclined to delay, or perhaps even reject the deal. However, because the FCC was satisfied that the merger did not adversely affect public policy and should be approved, its staff worked through the individual state PUCs to win approval by the targeted close date of July 2000. While there was potential opposition at the state level, several other state PUCs had voiced support of the acquisition early on, and once the FCC's position became clear, it was then politically untenable for any single state to be seen as the lone holdout to the combination of the two companies. In essence, the state PUCs and the FCC are continuing to sort out their proper role in the five or six years since the Act became law.

[52] *Verizon et al v. FCC (2002)*, for example, and more generally, the Chevron Doctrine.

The case for natural monopoly in telecommunications is progressively being challenged. As local and long distance telephony becomes available over cable and satellite, arguments for natural monopoly – and the corresponding regulation of local service – appear to have been weakened. The dichotomy between cable regulation – which is minimal – and telephone service regulation, which is much more substantial, would seem a logical candidate for regulatory reform. At the same time, it will be essential that public policy explicitly address universal service shortfalls that are brought on by deregulation, and the resulting changes to existing funding mechanisms.

UNEs, TELRIC and Interconnection

There is significant disagreement in Alaska over the cost of interconnection for local service. The leasing of unbundled network elements enable CLECs to use (among other things) the local loops, or the last mile of connectivity, owned by the incumbent local phone companies, which of itself is not in dispute. However, the Telecommunications Act of 1996 requires that network elements be priced based on cost, and may include a reasonable profit.[53] The FCC has determined that UNE costs be based on a forward looking standard now known as the Total Element Long Run Incremental Cost (TELRIC).

The RCA and ACS have significant discrepancies regarding the appropriate wholesale prices that are assigned to local loops. ACS claims that it is being forced to sell UNEs significantly below cost. Unfortunately, establishing a mutually agreeable price has been problematic, to say the least, because of the many variables associated with determining costs for a carrier. The situation in Alaska is similar to other states where the RBOCs – notably Verizon and SBC – complain vociferously about UNE rates being priced too low.

Some of the variables used to estimate UNE pricing to CLECs include depreciation schedules, as well as the number of customers in a service area over which to spread costs. However, the FCC model, which did include Alaska-specific input parameters is still an estimation and excludes costs for the integration of new equipment into existing networks. The model also does not address the effects on the applicable customer base as a result of competition. For instance, the entry of competitors in a market, by definition, presumes that an incumbent carrier will not retain a 100% share of households as customers. How much less than 100% cannot be known of course, which is precisely one of the dilemmas associated with hypothetical models.

Using a forward-looking methodology assumes all ILEC costs are incremental, the most efficient currently available[54], a hypothetical green field approach where all networks and systems are state of the art, and there is no legacy equipment to integrate.[55] Data needed to produce accurate forward-looking representations of cost has traditionally

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[53] Section 252(d)(1).

[54] Lehman, Dale and Dennis Weisman. *The Telecommunications Act of 1996: The "Costs" of Managed Competition*, Kluwer: Boston (2000), p. 66.

[55] ILEC costs to integrate new equipment of course would have to be balanced against the near-zero marginal costs, in some cases, of bringing on new customers, but this assumption is already implicit in the FCC model.

been lacking as well.[56] And it appears that defections by the incumbent's customers to competitors are not factored into the model. Further, if telecommunications technology is changing rapidly, there are implications for depreciation rates, which suggest that they must be accelerated to reflect the increased obsolescence factor, consistent with the proposition that incumbent carriers should be encouraged to upgrade their networks and make them more efficient.

Network Access and Investment Incentives

However, few suggest that some form of mandatory interconnection arbitration is not necessary when ILECs and CLECs cannot reach agreement on their own. And so, some dispute resolution mechanism in a transition from regulated monopoly appears necessary because of the ILECs' past tendency to simply refuse interconnection or payment for transport or termination charges.[57]

GCI indicates that it has had significant problems in obtaining compliance from ACS in regard to interconnection for local service. ACS has also been unable or unwilling to provide operations support systems (OSS) to competitors even though at least some of its own processes are automated.

None of the actions by ILECs should be surprising, however. The ILEC plants and facilities are privately owned, and it is logical to expect carriers to compete aggressively. Such spirited attitudes are a key driver – the same motivations powering the innovations and efficiencies that policymakers seek to achieve through competition.

Section 251 and 252 are on the books; interconnection and access to UNEs are required. However, the Act did not intend for pricing of UNEs to provide a direct subsidy to competitors, and state regulators should seek to ensure that they are not fostering an unsustainable and artificially competitive environment.

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[56] Gasmi, Farid, D. Mark Kennet, Jean-Jacques Laffont and William W. Sharkey. *Cost Proxy Models and Telecommunications Policy*, MIT Press: Cambridge, MA (2002).

[57] For example: "Before enactment of the Telecommunications Act of 1996, compensation of commercial mobile radio service (CMRS) providers for transport of calls placed by LEC customers was governed by Section 20.11 of the Commission's rules, which required LEC and CMRS providers to pay reasonable compensation for transport and termination of the other carrier's calls. This rule, however, was widely ignored by LECs, which did not compensate CMRS providers for transport and termination of LEC customers' calls, even when those same LECs where charging CMRS providers for transport and termination of calls placed by CMRS customers to ILEC customers." Kennedy, Charles H. *U.S. Telecommunications Law, 2nd edition*, Artech House: Norwood, MA (2001), p. 133.

Other examples of foot-dragging in regard to competition are not uncommon. A well-regarded telecommunications dictionary includes the following information in its definition for CLEC: "The...problem was the ILECs deeply resented the idea that that they were to allow competitors to get started in business at their expense and using their equipment and their lines. So the ILECs basically did everything they could get away with to mess up the CLECs. That meant delaying CLECs orders, creating onerous, cumbersome, new rules for doing business with them and creating huge, new charges for new services." Newton, Harry. *Newton's Telecom Dictionary, 18th Edition*, CMP Books: Gilroy, CA (2002) p. 160.

Two key issues regarding competitor access must be sifted out pursuant to Section 251 of the 1996 Telecommunications Act – open access and efficiency. The Act requires that access by local exchange carriers to competitors be fair and open, but specifics on standards are lacking, and there are varying degrees of automation and competence within the RBOC and ILEC systems. So in some cases, what might like look like discriminatory tactics are not if the ILEC is also subject to the same constraints. That is, the less than optimal treatment that CLECs may receive is not necessarily a function of discrimination, but rather limitations on ILEC internal systems and processes. While regulation can provide a check on discrimination regarding open access to networks[58], competition is more likely to provide one for inefficiency.

In spite of these open issues, the question inevitably comes back to what regulatory framework will be most effective at attracting investment that will benefit consumers. In that regard, SBC has been an interesting case study. The company argues that escalating requirements to open its networks has been a prime source of disincentive to invest in new facilities. As an example, SBC has the ability to deploy digital loop carrier (DLC) technology, which increases the reach of DSL service to homes in more remote locales. DSL is limited to distances on the physical copper connection of about 30,000 feet (ideally much less in order to obtain bandwidth rates above 144 Kbps) between the nearest central office and a business or residential customer. As a result, many homes do not qualify for the service. By establishing DLC facilities – essentially a fiber connection from the central office to a remote terminal (RT) closer to customer locations, the length of the copper loop is shortened.

Building out DLCs are expensive, and the RBOCs are not inclined to build such facilities only to be forced in turn to offer them to their competitors. And so the deployment of the technology has stalled, except in individual circumstances, where the uncertainty regarding potential obligations to RBOCs has been removed by state Legislatures (see Appendix I – Oklahoma Experience with Broadband).

The ability to obtain a return on investment is a reasonable expectation for telecommunications companies. If these firms will be required to share facilities with competitors at prices set below costs by regulation, the ability to operate at a profit or achieve a return is less certain, and investment may lag. Policymakers should consider these dynamics in attempting to establish an environment that rewards private capital.

Different Approaches to Deregulation

Cable regulation was relatively short-lived, and exists today on a limited scale. Prices that providers may charge beyond basic cable service are essentially unregulated, which some have argued, has lured in new competition from satellite providers.

Deregulation of long distance in the U.S., however, followed a markedly different path. In 1984, in an effort to initiate competition, FCC regulators established pricing and interconnection requirements on the incumbent, AT&T, which enabled MCI and later Sprint to establish a foothold in the long distance market and build out facilities over the next decade. While the approach, even the eventual outcome may be controversial (e.g.

[58] In essence, establishing the rules of the game in the form of a level playing field.

WorldCom's recent bankruptcy) the tactic nonetheless provided a vehicle for competition in the telecommunications industry.

As such, transitioning from regulated monopoly to a competitive environment is a difficult proposition. When AT&T first agreed to regulation in 1913, the stage was set for the telephone industry to become essentially a franchise monopoly in the U.S. At that point in time, the industry might have evolved in a number of different ways, with perhaps less regulatory overhead as a result of other paths taken. Requiring interconnection among the many independent carriers, for example, was an alternative that would have provided many communities with one or more local service providers.

Innovative and Cost Effective Deployment and Use of Advanced Telecommunications Infrastructure

On the surface, Alaskan demographics appear to compare very favorably with the rest of the U.S., even other rural states. For example, while a significant portion of the population is rural, statistics for income and Internet access are higher than the U.S. national average, and higher than other largely rural states.

Based on recent data[59], Alaska has 7.6% of its population below the poverty level. This compares favorably with the U.S. national average of 11.8%. The percentage of residents who have completed high school is 90.4%, compared with 84.1% of the U.S. as a whole. The percentage of residents that have completed college is 28.1%, compared with a U.S. average of 25.6%.

Median income in Alaska is also relatively high at $51,509, compared with $40,816 for the U.S. As noted earlier, data indicates that 64.8% of households in Alaska have computers (nation average is 51.0%) and 55.6% have Internet access (vs. 41.5% of the U.S.).

Across all age groups in the U.S. overall, Internet use is highest among children and teenagers. Internet use is increasing for people regardless of income, education, race, ethnicity or gender. Common Internet-related activities use of email, making online purchases and searching for health information. In Alaska, the percentage of inhabitants who are Internet users is between 66-72%, compared with a national average of about 54%. Alaska's numbers are higher than rural states such as Montana (55-60%), North Dakota (53-60%) and South Dakota (56-60%), and comparable to Wyoming (59-65%)[60]

Nonetheless, Internet usage among Alaskans remains uneven. Urban access and usage is relatively high, which skews the statistics because about 40% of the state's population resides in Anchorage alone. In addition, Alaska's situation is unique in the United States.

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[59] U.S. Census Bureau, Statistical Abstract of the United States: 2001.
[60] U.S. Department of Commerce, Economics and Statistics Administration, National Telecommunications and Information Administration. "A Nation Online: How Americans Are Expanding Their Use of the Internet", (February 2002).

Technology, Geography and Organization

While rural areas in other states typically have physical wireline telephone connections, in Alaska – where vast numbers of communities are not connected by roads of any kind – there is limited wireline deployment. As a result, Alaska's rural telecommunications traditional infrastructure has often consisted of wireline service at the local exchange level, with C-band satellite ground stations supporting long distance. Deployment of C-band ground stations costs about $200,000 per site or community. These ground stations can also be upgraded to support Internet access.

A less expensive alternative for Internet service is Ku-band ground stations that can be deployed for $20,000, with another $20,000 required for local access hubs, routers and antennas. The technology also supports long distance calling.

In the smaller communities, local access to Internet service has been somewhat sporadic, often depending on leadership at the community or regional level. In general, communities that actively support economic development, or are more technologically progressive, are more likely to develop innovative ICT solutions. Surveying best practices nationwide finds essentially no splashy triumphs. Successful innovation is typically a quiet, methodical undertaking, such as the community initiatives mentioned above. In addition, two largely rural local providers operating in the lower 48 – Alltel and CenturyTel – have weathered the telecommunications storm well by targeting underserved markets, emphasizing disciplined cost management and customer service.

The urban areas in Alaska (Anchorage, Juneau, and Fairbanks) are seeing the emergence of competition and the technological advancements that are accompanied by competition. The rural communities, as to be expected, will see less competition, at least in the near term. In most cases, establishing broadband telecommunications in the more remote areas is entirely dependent upon the ability of the community to understand, organize, and develop the basis for infrastructure and interconnection associated with advanced information and communications technologies.

Many rural leaders in Alaska understand that telecommunications services will enable their communities to expand and support themselves in new ways and have established cooperatives to assist in the build out of high-speed telecommunications. Kotzebue, for example, has banded together, and implemented a telecommunications infrastructure, which gives the community the ability to initiate eCommerce, and develop new business models for enterprises that serve the local vicinity.

Process and Progress

Kotzebue, in the Northwest Artic region of Alaska, represents an excellent case study of an innovative approach to procuring Internet access for rural communities through collaboration. Inutek.net is a joint venture between GCI, OTZ (a rural telephone cooperative) and the Maniilaq Association (a non-profit health and social services company). The service provides relatively inexpensive broadband Internet access to 12 communities using DSL in half of the villages, and fixed wireless in the other half. A key innovation of the approach is that each organization provides support to the effort based on its core strengths. Maniilaq provides technical services and maintenance by making

use of local resources that larger, distant organizations often have trouble maintaining remotely. OTZ, as the local phone company, has a economical and scaled infrastructure already in place to provide billing services. And GCI leverages its traditional strength in long distance. After the first year, penetration is estimated at 28%.

There are many rural communities in Alaska with proactive leadership, a situation which should be encouraged. Others, however, may need to be prodded or coached. Douglas, Wyoming, known for being one of America's best small towns[61], presents one best practice case studies arising elsewhere. In 1997, Douglas participated in a five-county telecommunications planning study. Spearheaded by the Northeast Economic Development Coalition (NEWEDC), the study eventually determined that local leaders lacked sufficient information to make thoughtful decisions about technology investments. Because of inadequate coordination among major institutions, the region was passing up opportunities to improve services.

The study indicated that large telecommunications users, such as coal companies, hospitals and schools had the potential to coordinate demand and attract higher levels of telecommunication services. Underutilized networks already in place presented the opportunity to lease excess capacity. Meanwhile, service upgrades that were still in the planning stage enabled community officials to negotiate for high-speed services.

A major recommendation of the study was to stimulate local demand through training, mentoring, computer recycling and financing of computer purchases. The plan also advocated increasing awareness among public officials in order to help build support for telecommunications investments.

Since the strategic plan was developed in February 1998, an interesting outcome has been that community leaders are now sophisticated buyers. They have met with Sprint Communications to discuss the establishment of a point of presence within the study area – a process that involves installing switching equipment at the USWest (now Qwest) central office. Further, Powder River Energy is investigating the feasibility of offering telecommunications services in two of the more sparsely populated counties. In essence, the regional telecommunications plan was the central catalyst that provided the leaders with information for negotiation, and also helped them focus efforts on regional economic development priorities.

The lesson for Alaska is that community strengths should be examined on an individual basis, perhaps with State or other outside assistance. From there a strategic plan can be developed to leverage both the strengths of the community and emerging technologies, which should include efforts to increase the level of sophistication of the members of the community on these new technologies. These educated purchasers of ICT services can craft innovative solutions and stimulate demand at the local level – and at least to some degree, each particular area solution will be unique.

Community and Cooperative Solutions

Leadership is critical in the smaller communities in Alaska. Municipalities, villages and communities, and can act a potential supplier or service provider if there is no other

[61] As named by McMillan Publishing.

entity providing service and if the private sector is hesitant to build out infrastructure. As outlined earlier, this actually occurred in Alaska in 1975, when the State Legislature appropriated $5 million for the build-out of small satellite earth stations in 100 Alaskan villages. Where Alascom had been reluctant to build out the infrastructure, the company did handle installation, operation and maintenance, and eventually took ownership of the equipment as well.

Alaskan communities can help create attractive market opportunities by aggregating local demand, including municipal purchases of telecom services, in order to provide an attractive market for their business. As they pool and stimulate demand at the local level, they begin to create an attractive environment for the investment dollars or the entry of broadband service providers.

Local communities have five basic options regarding the promotion of economic development:

- Attracting new employers to the area.
- Improving the efficiency of existing firms.
- Improving the ability of local firms to export, or add value before exporting to other locales.
- Encouraging new business formation.
- Increasing aids, grants and/or transfers to the community.[62]

Communities that are the most successful at exploiting the benefits of new technologies take an active role in practical application and seeking new opportunities. They have the potential to maximize the use of human capital and other resources. Improving education and sophistication of users about the benefits of ICTs is essential, and can drive increased demand for services, as well as economic output.

Communities or regions need not be passive about developing solutions. As an example, before the widespread use of telephones in the United States, the two primary users groups were businesses and rural farmers of moderate or lower means. In the case of the farmers, telephone companies could not profitably provide last mile connections. The farmers formed cooperatives and shared the costs of connection to the nearest telephone facility.

Strategic planning at the state or regional level can help achieve this goal by evaluating the market place and assessing community leadership, existing opportunities, and potential technology applications. Further, for planning purposes, as new communities or villages develop, consideration should be given to establishing telecommunications infrastructure in much the same way that other forms of infrastructure are typically established in advance or in conjunction with new develop projects.

Engage the FCC on Universal Service and Other Telecom Issues of Importance to Alaska

[62] Shaffer, Ron. *Community Economics: Economic Structure and Change in Smaller Communities,* Ames, IA: Iowa State University Press (1989).

There are many issues of importance to Alaska facing the FCC. Among the most critical are a variety of universal service concerns, including the nature of the services that should receive federal funding, and the overall level of that support. The various forms of universal service funding are a key component of Alaska's telecommunications. Yet this support is potentially at risk because of FCC allocation mechanisms are often heavily influenced by lobbying from large telecommunications carriers and more populous states.[63] The 1996 Telecommunications Act requires that universal service support become more explicit, and this requirement has made and likely will continue to make universal service support more political as well.

Rate integration for interexchange services is another important federal policy for Alaska. Under current policy, long distances rates in the U.S. are averaged across all states, which greatly benefits Alaskan citizens in the form of lower rates for long distance. Were rate averaging to be abandoned, the cost for long distance services to Alaskans would increase, unless a corresponding increase in another support mechanism were established.

Educating policymakers becomes crucial. State Administrations have actively participated in FCC matters involving universal service issues for decades. But because the FCC retains so much discretion with regard to designing and implementing telecommunications policy, the RCA and other State officials should continue to seek to aggressively educate the Commission on the real issues facing rural states that competition alone will not address.

Another issue at the federal level is the question regarding the objectivity of modeling tools and techniques used by the FCC to determine universal service allocations and UNE costing. There is evidence that these models favor larger carriers, which suggests that lobbying and political clout by these well-funded players can distort analyses for Alaska. Hypothetical models, admitted estimations of averaged, optimal, forward-looking costs, should be treated skeptically, particularly because the unique conditions in Alaska may not be properly reflected in the parameters and sensitivities that will affect a given model's output.

Innovative Policy for Telecommunications Across All Federal Agencies

For innovative applications that can improve consumer and societal welfare, which have a telecommunications component, but are not purely telecom, it may not be appropriate or necessary for the FCC to administer them. Other federal agencies should be engaged in the same way that the Department of Agriculture has been creatively engaged in order to secure funding to build-out Alaska's telecommunication infrastructure. In addition to federal funding emanating from telecommunications legislation, perhaps initiatives like the Schools and Libraries program could also be developed directly through the Department of Education and generate additional support.

Alaska continues to secure wins at the federal level. The recent award, for example, to Alaska of $7.5 million for the development of rural telecommunications infrastructure is

[63] Testimony by former FCC Commissioner Harold Furchgott-Roth to Alaska State Senate Judiciary Committee (June 12, 2002).

certainly good news. In addition, the Denali Commission efforts can be steered to telecommunications development activities if warranted. Alaska has enjoyed the sponsorship of Senator Ted Stevens, and should look to other federal representatives to champion these issues as well.

Existing programs or future legislation could be tailored for telemedicine in conjunction with staff from the Department of Health and Human Services. Specifically, with regard to telemedicine, there are still unresolved issues about coverage such as Medicare or Medicaid.

For example, there are different categories of costs associated with in-person doctor visits compared to the remote diagnoses and treatment aspects of telemedicine carts. While an airline ticket to a specialist's office in Alaska under the tradition approach is often covered, there is no analogous funding in place through the Rural Health Care program for the infrastructure to support telemedicine applications, which could more than offset the cost of air travel. As new applications to traditional public services are made possible through telecommunications, support and funding should logically come from the agencies that administer those traditional services as well.

Competitive Carrier Infrastructure Build-Outs

One of the mistakes that CLECs (operating in the lower 48) clearly made was expanding their presence too rapidly and spreading themselves too thin. At the same time, these CLECs did not plan adequately for the provision of additional value-added services or eventual profitability. Experience from other industries suggests that entrants who succeed in newly deregulated industries do so by moving methodically, with a deep understanding of their value proposition and organizational capabilities.[64]

In the case of the telecommunications industry, CLECs that have been successful (and there are many) have moved prudently, ensuring that their build outs are sustainable, supported by adequate local demand. In many cases, these competitive carriers are bubbling beneath the surface – with little fanfare or press coverage – moving steadily and cautiously ahead.

While GCI has taken this approach, there are other examples of successful CLECs that are not well known. New Edge Networks, for example – licensed in Alaska – has slowly built a DSL network across the U.S., focusing on underserved small and medium-sized markets. The company has modest revenues of $60 million, but also modest levels of debt ($35 million). By contrast, other DSL providers such as Northpoint and Rhythms expanded too rapidly and later declared bankruptcy, with significant portions of their networks eventually shut down.

Alaska is better positioned than many states in this regard. While early CLECs overbuilt and collapsed under their enormous debt loads, the impact to Alaska has been minimal because their focus was in the lower 48. For policymakers and regulators in Alaska, the implications suggest that competitors will find a way to compete if markets are open. Subsidizing competitors with below cost UNEs may not be sustainable policy, and could

[64] See Appendix II for deregulatory analogies from the airline industry.

produce unintended consequences, such as the financial distress or failure of incumbent carriers.

UNE Pricing Issues

UNE pricing throughout the country has been a matter for substantial debate and litigation in the courts. This is exacerbated, in part, because rate averaging has kept carriers from systematically tracking costs by user or market segment in any sort of detailed fashion over the years. As discussed earlier, the standard that the FCC has set for assigning UNE prices is the TELRIC methodology, or forward looking and, ultimately, hypothetical prices.

Data presented to the APUC and RCA regarding proposed UNE rates were compared at length to UNE rates in the lower 48. Yet, not only are local service costs in Alaska potentially higher because of its extreme rural nature, but evidence suggests that PUCs across the country may have set UNE rates aggressively low.[65] In general, the FCC and state PUCs appear to have biased UNE pricing methodologies downward in the belief that this would encourage ILECs to update and modernize their networks.[66] For Alaska, individual rural service calls to distant locations, with no access by road and subject to extreme weather conditions can costs thousands of dollars, compared to a few hundred dollars in the lower 48. It is not at all clear that these above average costs for COLR ILECs are reflected in the determination of providing unbundled network elements to competitive carriers.

More broadly, from a policy perspective, there is significant question regarding whether below cost, or forward looking pricing assuming an environment of declining costs provides an incentive to incumbent carriers to invest in their networks to become more efficient. In fact research suggests the opposite.[67]

The substantial spending by telecommunications carriers, even into 2001, is often cited as proof of the effectiveness of current UNE policy. However, it is not at all apparent that telecom infrastructure spending by ILECs was because of aggressive UNE pricing, or alternatively, a response to the prospect of facilities-based competition, or even post-regulatory euphoria. Regardless, capital spending by ILECs has been substantially reduced in 2002, and requiring access to their network elements below cost appears to be a questionable means of inducing new investment.

The variance between ILEC and CLEC estimates of forward-looking costs is wide indeed. In a recent Virginia arbitration, for example, the ILEC (Verizon) proposed a loop price of $22, while AT&T and WorldCom estimated an applicable cost of about $6.50[68].

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[65] Lehman, Dale. "The Court's Divide", *Review of Network Economics* 1:2 (September 2002) pp. 106-118.

[66] Huber, Kellog and Thorne. *Federal Telecommunications Law, 2nd Edition*, Aspen: New York (2002).

[67] Mandy, David. "Pricing Network Elements When Costs are Changing", *Telecommunications Policy* 26 (2002) pp. 53-67; Lehman and Weisman. *The Telecommunications Act of 1996: The 'Costs' of Managed Competition*, Kluwer: Boston (2000).

[68] Tardiff, Timothy. "Pricing Unbundled Network Elements and the FCC's TELRIC Rule: Economic and Modeling Issues", *Review of Network Economics* 1:2 (September 2002) p. 139.

Within Alaska, ACS has estimated the cost of providing service in Fairbanks on a forward looking basis at $36, while the RCA set UNE prices at $19.19.

The FCC's first preference for setting UNE prices is by negotiation between carriers, but state PUCs must often arbitrate. However, when this occurs, the evidence suggests that UNE pricing tends to be lower than both embedded and forward looking costs, which tends to remove incentives by carriers to invest in their networks.

Alaska has significantly different factors that make up the cost structure associated with providing telecommunications services to rural communities, including extremely low population densities, a high degree of geographic dispersion between population clusters, as well as a harsh climate and rugged terrain. Although existing TELRIC model variables apparently have some flexibility with regard to inputs and sensitivity, they may still not do a good job of reflecting the forward looking costs of building out infrastructure in Alaska. And while the FCC has imposed hypothetical networks as the standard for cost modeling, future networks will still have to be built in the real world by actual companies.

Consistent Actions by Legislature, Regulatory Agencies, and Executive Branches of Government to Promote Universal Service, Infrastructure Development, Competitive Neutrality, and Appropriate Levels of Regulation

Deregulation vs. Managed Competition

Should the FCC or the RCA try to regulate outcomes? The RCA's decisions have been generally consistent with the FCC's position.

Yet the proper role of the RCA, based on precedent, is unclear. For example, when does the RCA make the determination that competition in any given market exists? While market share tests have been proposed, specifics on definition are lacking. And in an attempt to ensure competition, does that also mean that the RCA should take steps to ensure the survival of ACS if it founders? Is it possible that proactive regulation by the RCA becomes the proximate cause for the demise of ACS? And if TELRIC pricing is too far below cost, does it, in effect, reward inefficient competitors.

By the same token, ACS has long-term debt of $611 million on 2001 revenues of $332 million. Did the company miscalculate the impact of the 1996 Telecommunications Act or the manner in which it would be interpreted by the RCA, and in the process, over-weight its balance sheet with debt? And should the Legislature or the RCA take this into account? Where does regulation leave off and competition appropriately begin?

While many of the smallest or most remote communities in Alaska may not be able to support competition in local exchange services, creative solutions for telephone service and broadband access have been crafted through public-private initiatives at the local level. It may not be pure competition, but it appears to be effective. Such cooperative rural solutions are a world away from what works well in larger metropolitan areas, or even medium sized communities. Hence, crafting public policy to reflect these divergent settings must avoid foreclosing options on either score.

For Alaska, GCI is poised to compete on several fronts for local service, both in the larger cities as well as in the rural communities if it chooses to do so. Regardless of what happens to UNE rates, with its cable and wireless last mile access options, GCI is aggressively competing on several fronts, using technology to bypass the ILECs. Still further, a significant issue regarding rural ILEC viability is how they will respond to competition – by retrenching, seeking relief from the courts, or regulatory agencies – or by looking for creative ways of offering new services and/or ways to lower costs.

In short, actions by telecommunication providers and municipalities, outside the bulk of the regulatory framework, are being crafted and are working. Federal monies can clearly play a key role in funding infrastructure, and policymakers in the Executive Branch and the RCA should be proactive in that arena to ensure that telecommunications development in Alaska is comparable to other states.

However, in regard to regulatory oversight, the old adage of less is more may be particularly applicable. The private sector is demonstrating its ability identify and

develop innovative services, and when necessary, those efforts are augmented by cooperative municipal engagement and support. To the greatest extent possible, those entities should be left alone to continue to do so.

Federal Support for Telecommunications in Alaska

Federal support programs for telecommunications services to and within Alaska are critical. Therefore it is crucial that the regulatory and administrative infrastructure necessary to qualify, obtain, and lobby for high cost support remains in place. For example, the RCA currently certifies carriers in order to make them eligible to receive High Cost program support.

The RCA has weighed in on the FCC's proposed rulemaking change[69], which would reclassify broadband services such as DSL under Title I private carrier status, from its current Title II common carrier status. This is perhaps the most significant pending rulemaking change by the FCC, and if implemented, would deregulate some number of broadband services in the hope of stimulating investment and competition with cable broadband.

Given the increased interest by federal legislators in telecommunications since the industry's severe downturn[70], there is potential for telecommunications legislation in the next session. At present national security issues are preoccupying federal lawmakers, but there also appears to be growing support for reform of the 1996 Act and/or expanding the definition of universal service to include the High Cost Fund.

Alaskan policymakers would have a significant potential stake in such legislation, and should actively promote the State's needs in this area. For example, costs for Alaskan providers to dispatch technicians to remote sites can run to the thousands of dollars. Such a scenario is not comparable to any other state – even other rural states, where virtually all customer locations can still be reached by highway. In Alaska, planes or ferries often provide the *only* means of physical access to customer sites.

Role of the RCA

The APUC, and to a lesser extent, the RCA have been the topic of substantial debate in Alaska. Both agencies have been criticized for slow turnaround times on decisions by utilities. And in a fast moving market like telecommunications, regulatory lethargy can act as a drag on innovation and service.

As has been suggested, the State could increase the resources available to the RCA in order to help clear the current backlog of dockets and make faster progress on the implementation of the planned MIS case tracking system. However, to fund these

[69] CC Docket No. 02-33: Appropriate Framework for Broadband Access to the Internet of Wireline Facilities.

[70] For example, the recent U.S. Senate Committee on Commerce, Science and Transportation Hearing on the Government's Role in Promoting the Future of the Telecommunications Industry and Broadband Deployment (October 1, 2002).

resources directly might require increased appropriations or revenue from other sources, such as user fees or additional regulatory surcharges on the ratepayers' monthly bills .

Another approach, depending on the ultimate goals of the State Legislature, would be to alter the charter of the RCA, so that its primary mission would be to reduce the scope of its activities as the telecommunications industry in Alaska witnesses increasing competition. Giving the agency more latitude over whether to open dockets, for example, would enable the RCA to cede control to the market in a measured fashion.

The two above approaches are markedly different, and would lead the State down separate paths regarding telecommunications regulation. Efficient management of RCA's caseload, without giving the agency the ability to decline hearing certain categories of cases, may well require additional resources that will lead to faster processing of caseloads in the near term. If in the longer term, however, the Legislature's intention is to reduce the RCA's scope of responsibility over time as markets are opened, specific criteria and targets should be codified into statutes.

Implementation of the Telecommunications Act of 1996 in a Manner That Addresses Alaska's Unique Characteristics

Recap of the 1996 Telecommunications Act

The 1996 Act uses both *structural* and *behavioral* instruments to accomplish its goals of reducing regulatory barriers to entry and competition, and outlaws artificial barriers to entry in local exchange markets in an attempt to engineer the maximum amount of competition. Quoting from the statute, the purpose of the Telecommunications Act of 1996 (Act) is to "promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[71]

More specifically, the Act mandates interconnection of telecommunications networks, unbundling, non-discrimination, and cost-based pricing of leased parts of the local exchange network, so that competitors can enter easily and compete component-by-component as well as service-by-service. However, previous discussion has indicated that cost-based pricing methodologies are subject to considerable debate.

Still another intent of the 1996 Act was to eliminate implicit subsidies and price distortions. To the extent that subsidies have been made explicit, this has been accomplished. Rate averaging in interstate interexchange (IXC) services is a fundamental policy of the Act – and one that is critically important to Alaska. The rate averaging has the effect of lowering average IXC rates[72] to Alaskans, which would otherwise be higher if calls were priced at actual cost.

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[71] Telecommunications Act of 1996, S.652 - Introduction.
[72] Local access fees charged by Alaskan ILECs are discussed separately.

The Act updates the Communications act of 1934, and provides a new national policy framework that relies on competition and market forces to advance the deployment of communications infrastructures throughout the U.S. The Act provides a framework for the following communications themes:

- Telephone services including local, long distance, and wireless
- Broadcast television
- Cable television
- Content and programming on television and computer networks including the Internet.[73]

Intended to provide the beginning of the end of regulation, the end game for 1996 Telecommunications Act is still uncertain. Based on burgeoning caseloads, there is work for the RCA, as well as other state PUCs, for years to come. The efforts and resources directed to legislators, regulators, attorneys and the judicial process are causing federal legislators to question whether the current framework is an effective one.

The outstanding issues arising from the passage of the Act have been roiling for the past few years, and are increasingly visible to policymakers and even the general public. As the groundswell of activity increases, legislators in Washington are increasingly likely to take up regulatory reform, which presents opportunities to Alaskan regulators and administrators to frame issues and positions. It would be prudent for Alaskan policymakers to develop an innovative, unified strategy of adequate scope, and then look for opportunities to build relationships in Washington once the new Congress is back in session. Enlisting federal agencies and developing coalitions with rural lawmakers from other states should position State favorably to shape the emerging debate.

Alaska Legislature

The Alaska Legislature establishes policy for telecommunications at a broad and high level. It has the ability to authorize or sunset regulatory commissions, as it did in 1999, when the Legislature abolished the APUC and created the RCA, with a sunset provision for 2003.

Most recently, the Legislature passed a bill that specifies procedural changes, such as rotating chairs, and deadline for issuance of final orders on new cases. In addition, a seven member task force has been authorized to make recommendations regarding rate and tariff arbitration, as well as whether the telecommunications related functions of the commission should be undertaken by a separate body or agency.

Regulatory Agency – APUC, RCA

Key decisions by the APUC and RCA include the removal of the rural exemption for ACS in Fairbanks and Juneau, and the establishment of UNE rates where the ACS does not have a rural exemption – specifically in Anchorage, Fairbanks and Juneau. The

[73] www.benton.org/Library/Landscape/landscape.html

commission is also considering action on reforming access charges for intrastate long distance connections to LECs, which are high relative to the rest of the country.

In addition, RCA Chairman is a member of the Federal-State Joint Board on Universal Service, which recently recommended that the definition of universal service not be expanded to include dial-up or broadband Internet access. There is legitimate concern on the part of policymakers that increasing the scope of universal service will further burden limited funding mechanisms, but the increasing importance of broadband in a range of productive applications strongly suggests continuing review.

The RCA has also weighed in against a proposed reclassification of broadband services by the FCC, which if adopted, would likely relieve carriers of the obligation of making unbundled network elements used to provide broadband Internet access service, including DSL, available to competitors.[74]

Alaska Executive Branch

As head of the Executive Branch, the Governor can play a key role in gaining visibility for telecommunications issues, as well as building coalitions to further policy goals. Alaska is a diverse state in terms of both it geography and its people. It should not be surprising that the more populous southern and eastern regions of the State will at least periodically be at loggerheads with each other, regardless of how district lines are drawn. At the same time, there are common themes regarding information and communications technologies that can find broad consensus and should be emphasized, not only at the state level, but also at the federal level.

Equally important are efforts such as the Telecommunications Information Council, chaired by Lt. Governor Fran Ulmer, which emphasizes public-private partnerships, and increased efficiency of government utilizing new technologies. Lt. Governor Ulmer is also a member of the FCC's Local and State Government Advisory Committee, which provides input and policy recommendations to the FCC. The important of participation in such national forums cannot be overemphasized.

Much the way Governor Jay Hammond championed basic universal service in the 1970s, future Alaska Governors should seek to champion universal availability of advanced services that will power the economy, as it completes the transformation from dominance by manufacturing to information. The impact of electronic commerce, medical imaging, transmission of patient genetic information, research, education and entertainment may not be as rapid as predicted, but inevitable, and ultimately far reaching.

Congressional Delegation

[74] Reply Comments of the Regulatory Commission of Alaska, CC Docket No. 02-33 (June 26, 2002)

At the federal level, the State of Alaska enjoys support from influential Senior Senator Ted Stevens, who has served since 1968[75] and has been instrumental in tailoring federal support for programs to reflect its unique rural characteristics. It is important to note that much of the impetus for universal service and other telecommunication development support have come directly from efforts of Senator Stevens.

Past initiatives by Alaska's federal representatives have made clear the importance of proactive policy initiatives that are national in scope. There are opportunities for Alaska's government branches and agencies to pursue initiatives and support at the federal level as well.

[75] Alaska achieved statehood in 1959, so Senator Stevens has the longest tenure in the State's history.

General Discussion

It is perhaps somewhat surprising, given the comparatively rugged landscape and sparsely distributed rural population, that Alaska has had significant success in promoting competition. Not unlike other rural states, Alaska has many independent ILECs. For a variety of reasons, the markets served by these independent ILECs have often been unattractive to the larger ILECs. Some RBOCs even still continue to sell off certain ILEC assets.[76] Independent ILECs are likely to be more involved in local communities and villages, and on-site support staffing is often easier and less expensive to provide for local companies.[77] In these types of rural settings, competition is not the overriding theme.

The benefits to be gained by competition in telecommunications are not distributed equally. Clearly larger metropolitan centers, with higher densities of users and facilities are more amenable to a competitive environment for local exchange services. In such places, all potential options are open: wireline (copper or fiber), cable[78], fixed and mobile wireless, satellite, laser, even microwave.

This presents a conundrum of sorts. Competition can lower the cost of service for these high-density users in more urban areas, but it also erodes rate-averaged support to other users. Over time this must be addressed through other support, or by increasing rates to consumers as they being to more closely align with the cost of service.

At some point – which probably defies pure quantitative definition – the relative efficiency of monopoly cooperative in a given community will give way to market efficiency. As indicated below in Figure 7, both social and economic factors enter the mix. Not only is population and technology important elements in the ability of a community obtain benefits from competition in telecommunications, but so are levels of human capital (i.e., receptiveness and interest in technology), social capital and business usage of information and telecommunications technologies.

Finally, it is important to note that the RBOCs serve only 65% of access lines in the U.S. as a whole, with the slack being picked up by independent LECs and cooperatives. If the market conditions for local exchange service were as inviting as once presupposed, it would seem likely that these larger ILECs would have accumulated a larger share of local exchanges. Instead, a reasonable inference is that rural markets may not enjoy the economies of scale that drive the larger carriers, that local cooperation may be of equal or greater importance as competition in terms of driving solutions, and that less regulatory oversight may be appropriate.

In order for meaningful competition to flourish, it may require a critical mass of factors (as highlighted in Figure 5). Over time, the capital investment required for competition

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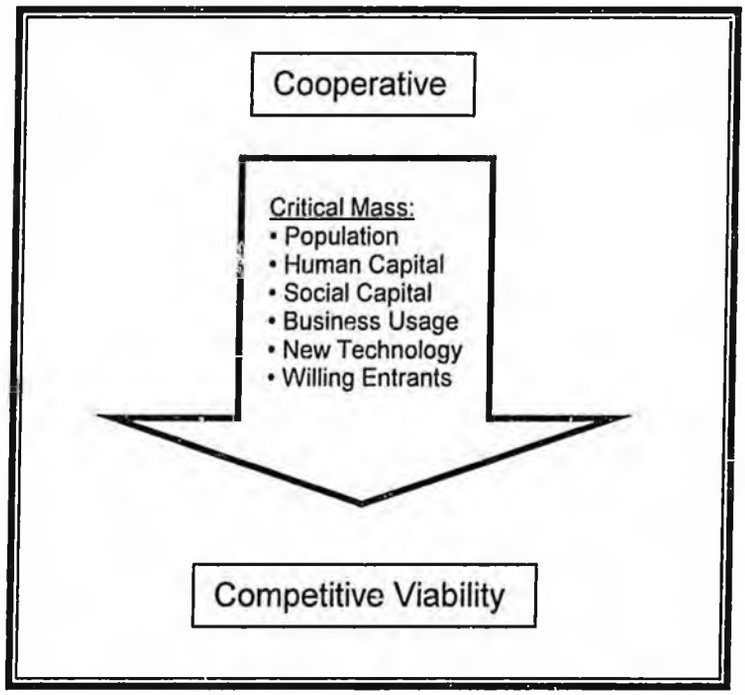
[76] USWest before and after it merged with Qwest has been selling ILECs that it could not profitably serve. Privately-held companies and cooperatives do not typically have the same investor market pressures for returns that publicly-held companies do.

[77] Larger ILECs do not maintain a presence in every community in which they serve, and technical service personnel must often drive, be ferried or flown in to provide service.

[78] Traditionally, cable has been a residentially focused medium. However, some metro areas and most suburbs are passed by cable infrastructure.

has diminished as the cost for new technologies continues to come down. This implies that public-private partnerships and initiatives will lead toward private investment in the coming years. It is important to note that there is no exact formula or algorithm for determining the optimal mix for sources of investment. Further, in many communities, the need for High Cost program support will almost certainly continue. Nonetheless, the factors outlined in Figure 7 can serve as a guidepost for policymakers to attempt to gauge the need for public vs. private investment in a given local market.

Figure 7. – Transition from Cooperative to Competition



Transition to Deregulation

Lessons from other regulated monopoly environments suggest that some incentive will be required for a competitor to risk capital in order to take on an entrenched incumbent. The UNE interconnection requirements provide such an incentive. UNE interconnection recognizes that incumbent's substantial asset and customer base has been built up over a period of years as a monopoly, with guaranteed rates of return. An industry, such as local telephone service, emerging from an extended period of regulated monopoly may imply that new entrants will be disadvantaged relative to the incumbent(s).

At the same time, if regulators attempt to manage outcomes, they may never cede the role of competition to the market. If the goal of the State is to transition to a deregulated environment, the RCA or telecommunications commission will have to be given more control over dockets – otherwise the current format of partial deregulation or re-regulation of the industry will continue indefinitely. In addition, in order to come to closure on the transition, the charter of the commission should include provisions to relinquish authority over local markets based on objective, measurable criteria.

Currently none exist. Timelines for phase out of regulatory duties should be targeted, and commissioners selected on the basis of their commitment to that charter.

Emerging technologies, driven by varying degrees of deregulation are poised to produce significant changes over the coming years. Cable telephony and innovative combinations of fixed wireless, DSL and satellite for Internet access[79] appear likely to be deployed soon. In addition, competition for local phone service from wireless providers has progressed, albeit in a somewhat incremental fashion.

If the promise has not yet been fulfilled, it may be worthwhile to remember the truism that the impact from technology is often overestimated in the short run and underestimated in the long run. Even with low-density population clusters, emerging technologies may yet provide for new alternate access options and competition.

Telecommunications and Alaska

In the U.S., Alaska is the only state with vigorous wireline competition for local service. The State's telecommunications industry has so far escaped much of the carnage that is plaguing national and international carriers. Nonetheless, Alaskan legislators, policymakers and regulators should continually examine the telecom landscape – broadly defined to include intermodal competitive efforts – in order to ensure that access is fair, the environment for investment is attractive to all carriers, that new services are being provided, and that the State is on a path to deregulation.

Further, the State should be vigilant to maintain its important role at the federal level on behalf of universal service. It is possible that funding mechanisms for universal service will come under mounting pressure in the future as the taxes and surcharges become more visible to consumers, businesses, and legislators. As a result, it will be important for Alaskan policymakers – ideally in conjunction with other states that contain a significant rural component – to quantify and articulate the benefits that accrue from universal service, not only those associated with standard telephone service, but also in regard to broadband (advanced) technologies.

It is becoming increasingly clear that benefits to society from Internet access can be substantial. From education to healthcare to commerce, as well as active participation in government, the Internet and broadband technologies have the potential to touch the lives of all citizens. With that in mind, Alaskan representatives should strive to take that message forward in policy discussions at the state and national levels. If these issues are important to other states, they are essential to Alaska.

[79] And eventually VoIP – Voice over Internet Protocol.

Appendix I. – Telecommunications Case Studies

There are several cases of rural states using public-private arrangements to further telecommunication policy. Several, for example, are constructing fiber optic backbones in an attempt to contribute to rural development. These include Iowa, Washington State and Colorado. However in the case of Iowa, one unintended consequence of such a government effort to service public agencies across the State was to in effect remove one of the biggest rural customers from the marketplace, which can be a significant disincentive for build-out of telecommunications infrastructure by a potential entrant into a given local market.

Wireline build-cuts have traditionally been the most common form of access used in the U.S. Even so, there are several rural states in the U S. where the average distance of switches to the Internet backbone exceeds 100 miles:

- Alaska
- Colorado
- Idaho
- Kansas
- Michigan
- Minnesota
- Montana
- Nebraska
- New Mexico
- Nevada
- North Dakota
- Oregon
- South Dakota
- Utah
- Wyoming

Sitka, Alaska holds the U.S. record for having a switch located the farthest away from an Internet backbone node: 1,130 miles. Overall, Alaska averages 390 miles from all switches to the nearest Internet backbone node, higher than another other state.[80] However, because of Alaska's geography, wireless – mobile, fixed and satellite – have been of equal or greater importance in terms of the State's telecommunications infrastructure.

Alaska's gaps in the availability of advanced services are not unique. Recently Senator Byron Dorgan of North Dakota pointed out that only 20 of the 24 local exchanges in his state were equipped to provide DSL service.[81]

Another rural state, Iowa, has been studied extensively and has been the source of many public-private approaches to encouraging a build-out of infrastructure:

> Consider, Spencer, Iowa, a community of about 11,000 in the northwest corner of the State. This municipal government recently assumed responsibility for providing telecommunications infrastructure and services to its residents. Spencer Municipal Utilities, a department of the municipal government operated under a separate board of directors, has provided traditional utilities (gas, water, and electricity) for some time. In 1997, however, it expanded to include telecommunications utilities for the community, including cable, Internet, and other data transfer services.[82]

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[80] Glass, Victor. "Rural Realities", *America's Network* (July 15,2002) p. 35.

[81] From recent hearings on the Turmoil in the telecom industry. Taken from Senator Dorgan's comments to Qwest COO Afshin Mohebbi, *Senate Commerce, Science and Transportation Committee*, Washington, DC (July 30, 2002).

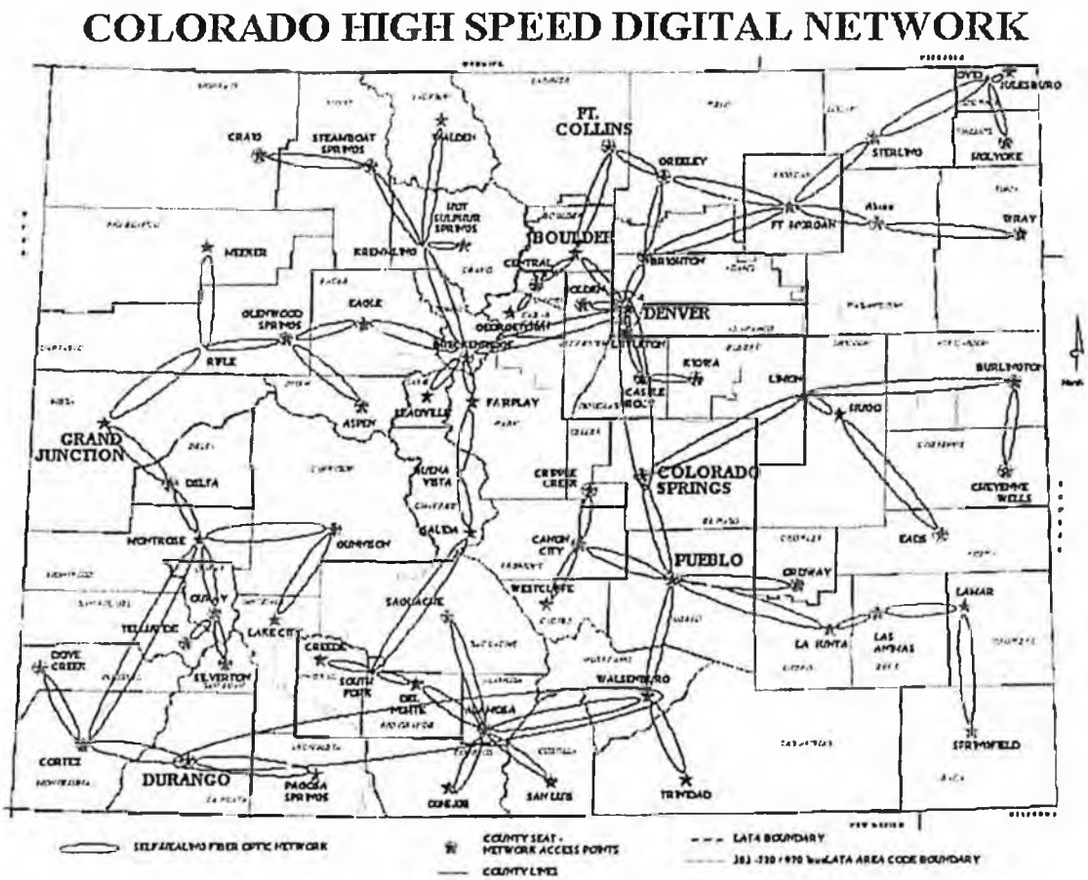
[82] Schreck, Erin K. "Municipal Governments' Use of Telecommunications: Leading the Charge or Lagging Behind", *Having All The Right Connections*, Korsching, Hipple, Abbott, eds., Praeger: Westport, CT (2000).

Colorado

In Colorado, the entire infrastructure has been updated for some smaller communities – the highway, sewer system, and the local schools have all been completely renovated. In general, the communities were progressing, except for affordable, high-speed Internet access to attract business, and to accommodate the technology needs of existing business and residents.

Equitable economic opportunity for all citizens of Colorado is dependent on rural as well as urban access to advanced telecommunications infrastructure. To stimulate private investment in underserved areas, the public sector's purchasing power was harnessed. Toward that end, the 1999 Colorado General Assembly passed two initiatives: The Multiuse Network and HB99-1102 (The Beanpole Bill). With the public sector customer acting as anchor tenant, business and residential customers benefit from improved telecommunications facilities.

Figure 8. – Colorado Fiber Network



The Multiuse Network (MNT) was designed to pool the purchasing power of the State's $13 million phone bill. Prior to passage of the bill, the State's traffic was not aggregated, Alamosa, for example, had 36 telephone lines. When these lines, along with their municipal counterparts throughout the State, were subsequently procured in bulk, the State reduced overall costs, but also obtained more optimal bundles of services capable

of simultaneously carrying voice, video, and data. Figure 8 illustrates the State's MNT architecture.

Since these services are leased from private providers, they can also be offered to the community at large. The Division of Telecommunications issued an RFP for the MNT in late 1999. An appropriation of $13.5 million in capital construction funds was made to fund the necessary network terminating equipment in State's offices.

HB99-1102 extends the geographic reach of the MNT to the local level to include all public facilities (schools, colleges, libraries, health care, and municipal and county facilities), not just State agency offices. The Bill, sponsored by State Representative Brad Young Lamar, provides matching funds to communities as an incentive to pool their demand. Each community issued its own RFP to private providers to connect these facilities to the nearest MNT point of presence. Communities then apply to the State for funding to cover a portion of the overall cost.

The MNT provides a statewide backbone that provides a connection point for local communities, while HB99-1102 provides additional traffic on the MNT. Together they provide a significant stimulus to private investment in telecommunications. The result will be a more equitable distribution of economic opportunity based on advanced technologies to all Colorado citizens. [83]

Chicago CivicNet

As mentioned previously, in order to champion the development of communication and broadband networks, some communities have formed public-private partnerships. With the goals of building infrastructure and creating opportunity – spanning projected timeframes of as much as ten years – Chicago has undertaken such a strategy with a project it called CiviceNet.

While the Chicago area population base and economics are very different from those of rural Alaska, some common themes continue to emerge with the use of public-private partnerships. Here again, the public entity leveraged resources available to it:

1) The city provided access to the carrier of city duct and conduit, city right-of-way, available city infrastructure, etc.

2) The city aggregated municipal demand into a single contract.

The Chicago metro area has a population of 2,900,000 covering 227 square miles.

Alberta SuperNet

This case involves a public-private partnership, which has an interesting feature: two distinct networks. There is base area network, which will be owned and maintained by

[83] Case study appeared as an article in Rural Development Perspective, a publication of the U.S. Department of Agriculture, Volume 14, Number 3. The article was co-authored by Kathleen McMahon and Priscilla Salant. Salant can be reached at salant@wsu.edu.

private funds (a consortium of Axia NetMedia Corp and Bell Intrigna), and an extended area network, which will be owned and maintained by the Government of Alberta.

The base area is made up of 27 communities, which have competition. The extended area network is intended to include 395 communities where there is insufficient demand for private providers to make a business case. Costs for the extended area program are capped at about $104 million. Fair access for the extended area network is guaranteed to interested ISPs, who will in turn provide services at urban rates. This is possible because the government is funding the development of the extended network.

The significance of Alberta's SuperNet is that ownership of the shared portion of the network is government-owned, which potentially alleviates many of the interconnection issues associated with sharing of privately owned facilities below cost. Alberta's population is 2,879,000 spread over 248,000 square miles.

Saskatchewan CommunityNet

Saskatchewa's CommunityNet has taken the approach of pooling demand and providing an anchor tenant as incentive for build-out. The plan is for a total of 366 communities to be connected in three years. The focus is on schools, healthcare facilities and government offices. Rural and northern communities currently receive $45M a year in basic support. Plans are to spend an additional $45M over six years. Connections to all "villages and hamlets" is considered too expensive, at least initially. The project is a joint development effort by SaskTel (government owned telco) and Saskatchewan Telecommunications. Saskatchewan's population is 1,027,800 spread over 228,445 square miles.

eGovernment Initiatives

In addition to eGovernment strategies, which focus primarily on Internet portal initiatives and their corresponding back office support systems, some states are also working on statewide telecommunications infrastructures in an attempt to more proactively address the digital divide themselves. Two states – Texas and Wyoming – have announced plans to develop a wide-area network enabling telemedicine. The efforts are intended to address geographical barriers typical of rural states. Other rural western states can be expected examine the feasibility of telecommunications driven alternative to traditional in-person medical diagnosis and treatment of patients.

In addition to telemedicine, other telecommunications applications include online voter registration, currently being explored by Montana, Nebraska and Pennsylvania. A logical extension of this would be electronic voting, particularly if funding for upgrades of voting systems becomes an issue.

Part and parcel of any increased reliance on telecommunications technologies is that of security, and efforts to mitigate risk. This will drive expenditures on such services and offer communities the opportunity to both pool and stimulate demand for broadband services. The focus of many of these initiatives are to lower costs, and to make government services more accessible in a self-service fashion, particularly to remote communities – all of which have clear applicability to Alaska.

Figure 9. – Oklahoma Experience with Broadband

NCSL Broadband Remarks - Senator Jim Dunlap:

"We've all heard the gloom-and-doom, Chicken Little predictions about what MIGHT happen if the regulations on high-speed Internet providers are made fair and equal. I'm not much on predicting the future - I'm not going to stand here and talk about what COULD happen. Instead, let me focus on what DID happen in Oklahoma.

In April, the Oklahoma Legislature passed a six-page broadband parity bill. Excluding the pages set aside for definitions and other formalities, the meat of the bill was actually just three simple paragraphs. The bill said that all providers of high-speed Internet broadband service should be treated the same. Initially, the bill said that if one service provider was regulated, all others must live under the same rules. However, it was changed to read even more clearly ... that no provider of broadband should be regulated. Incidentally, that change was made at the request of a cable company, Cox Communications. After the change was made, Cox said it would no longer oppose the bill, and it didn't.

So we passed a bill that said treat everyone the same. That made a lot of sense to us ... because in the broadband market, the cable industry has about 70 percent of the customers. DSL, provided in Oklahoma by Southwestern Bell among others, shares the remaining 30 percent of the market with two other tremendously promising players - fixed wireless and satellite. Those are the four players who make up the market.

But of those four competing technologies, only one was regulated. DSL. That stood all regulatory models on their heads...because, in plain English, we were regulating the little guy in the marketplace. It didn't make sense. So we rectified the problem ... and with the input of the cable industry and many others (independents such as Valor, the consumer group AARP) ... we said the best way to handle this is to make sure that no broadband provider is regulated. And, contrary to some of the grim predictions you have heard, in Oklahoma the sun still rises in the east every morning and sets in the west every evening.

In January, when the bill was filed, Cox Communications was the dominant broadband provider in Oklahoma, with more than 70 percent of the market. Today in Oklahoma, Cox is still the dominant broadband provider, with more than 70 percent of the market. In January, 49 competitive local telephone companies in Oklahoma were gaining an average of about 1,900 new lines each week. Today in Oklahoma, those 49 competitive local telephone companies are still doing business. The only difference is that they are now adding about 2,000 lines each week.

Now let's get to the next chapter of what DID happen. Less than two weeks after the governor signed the bill, Southwestern Bell announced it would spend AN ADDITIONAL $30 MILLION in OKLAHOMA over the next year-and-a-half ... that's $30 million above and beyond what the company had already budgeted for Oklahoma in the next 18 months. The capital would bring DSL to 37 ADDITIONAL towns ... and would expand the reach of DSL in 25 cities and towns that already had the service.

What did this bill cost the State of Oklahoma? Not one dime. No tax reductions or other implications. In fact, the bill clearly states no tax status can be changed because of this bill. What an incredible opportunity for Oklahoma ... which, like your states, I'm sure, is scrambling to find more ways to boost economic development and bring new technology to wider reaches of our state. And that's what's really important. The owner of a small business or a student using the Internet to research a term paper - they don't care about industry squabbles or he-said, she-said arguments between corporations. What that small business owner and that student care about is simple: 'Can I get broadband and will I have a choice in who I buy it from?' The answer for more and more Oklahomans today is "YES" to both.

It's no exaggeration to say that the response across Oklahoma to an additional $30 million investment in new technology has been swift and overwhelming. When the DSL expansion is complete, almost seven out of every 10 homes and businesses in Southwestern Bell's Oklahoma service area will have access to DSL. That compares mighty favorably with the national average, which is about 45 percent.

And what did it cost the competitive telecom industry? Not one new competitor has been hindered from doing business. This is crucial .. this bill changed nothing. Absolutely nothing No CLEC lost any network access or service that they were receiving before the passage of the bill. However they did business in Oklahoma before the bill was passed ... that's exactly the way they do business today. The bill did NOT change the competitive landscape except to send the message that all competitors would be treated THE SAME. No choosing winners. No choosing losers. Treat everybody the same.

Our bill just kept a bad thing from happening. What did it keep from happening? Something that made no economic sense. It makes no sense for a local telephone company to build technology that is new to the market - and then be forced to turn that technology over to a competitor. Unlike what happened in Oklahoma, when some state regulators got involved with broadband in other states, new investment and deployment came to a halt. We didn't want to see that happen in Oklahoma.

Broadband deployment is also being looked at on the federal level. We were aware of that in the Oklahoma Legislature when we began this process. Do you know what we decided? 'Why wait for Washington?' We decided not to let something this important to our state economy get bogged down in jurisdictional issues, not to let Washington bureaucrats sit on this for two or three years before taking any action. We saw an opportunity to do something good for Oklahoma -- right now. You never know what is going to happen in Washington, but I do know what already has happened in Oklahoma.

This is something I feel strongly about. As the chairman of ALEC, I encourage other national organizations -- like NCSL -- to take an active role in supporting faster broadband deployment. This is something that we can take care of for ourselves, on the state level. For proof, you don't need to look any farther than Oklahoma."

Appendix II. – Deregulation in the Airline Industry and Applicability to Telecommunications

In the years following the passage of the 1996 Telecommunications Act, many CLECs adopted flawed strategies that were encouraged by huge pools of available investment capital. Post-deregulation euphoria in telecom, combined with the rise of the dot.coms, and the now apparent myth of the first-mover advantage, led companies to pursue market share at all costs. Based on the MFS sale of its fiber network to WorldCom for a huge multiple of its actual costs to construct, many CLECs initiated business plans with at least the tacit assumption of selling off assets to larger carriers after a few years.

Looking across at other industries can be instructive at identifying technology and economic drive limitations. Since the late 1970s, few would argue against a preference to a competitive market environment when appropriate or applicable. A big advantage of having the market choose winners and losers where applicable is that the private sector, private capital – rather than government, in essence, the public at large – gets to foot the bill for the losers. And predicting which technologies or products will gain widespread public acceptance is not always easy, as the case study below highlights. The difficulty of course, is sometimes determining where the market is ill equipped because of technological or economic limitations.

Lessons from other industries facing deregulation might have been instructive. In the case of airline deregulation, for example, two well-known airline start-ups – People Express and Southwest Airlines – employed very different strategies in their attack on the major airlines, and achieved encountered different outcomes as a result.

People Express grew rapidly in the years following deregulation. It offered flat rate fares that were substantially below those offered by the major airlines. The upstart used a simple, flat rate fare structure much like Southwest Airlines. All of the seats on a given flight were sold at the same price, regardless of whether the customer was a business traveler or vacationer. This meant that the company was offering its entire inventory at very close to its marginal cost, with profitability dependent on high load factors.

Its market coverage was regional at first, but increased steadily, and its load factors were above industry averages. Based on its success, People Express decided on a bold plan to expand even more rapidly, and the company entered several major markets nationwide.

The previously regulated major air carriers had a much larger asset and national infrastructure base that had been built up in the decades preceding deregulation. Prior to the bold foray by People Express, these large carriers had remained relatively passive in their response to the upstart airline. However, when faced with such a blatant threat to market share and profitability, the major airlines, particularly American, struck back, which was enabled by a new developing technology.

In the years following fare deregulation, American had invested in a technology known as yield or revenue management, which priced its seats based on demand by business customers who were willing to pay much higher fares in exchange for the ability to purchase a seat on a plane very close to its scheduled departure. Its leisure customers,

on the other hand, were more price sensitive, but also more flexible in their travel plans, and could book trips farther out than business travelers.

The revenue management systems allocated seats on a given flight into price buckets, based on historical demand. Certain numbers were allocated to leisure travelers, who booked as much as a year in advance of their trip; the remainder were priced at or near full fare where they would remain in low demand until the near the departure date of the flight. This approach is a commonly accepted form of price discrimination that does a better job of matching value to price, and increases load factors.

With its new systems, American was able to match the fares of People Express, allocating only the number of seat it would not need for its higher paying business customers, who would be booking their flights only days or hours before their flights. Thus American captured enough demand fill its planes, yet not turn away last minute flyers who were willing to may significantly more for the last remaining seats on any given plane.

By taking the major airlines head on, People Express forced them to respond. It illustrates the nature of competition when an entrant faces firms that are highly capitalized.

In contrast, Southwest Airlines took a more measured approach to competition. Rather than stand toe-to-toe with the major airlines, Southwest entered the airline market with an entirely different perspective. For starters, they initially viewed their chief competition coming from the automobile as much as other airlines. Southwest started on short-hop routes and implemented a cost base that reflected an understanding that its customers could drive instead of fly.

In addition, when Southwest set out to benchmark the turnaround times for its planes upon arrival at their gates, it did not use examine best practices from the major carriers. Instead, Southwest analyzed how Indy 500 pit crews get a race vehicle into and out of a pit stop in less than 30 seconds. These insights were used to design a process to get it planes in and out of airport gates in 30 minutes or less on average. These short turnaround times enabled higher utilization of equipment than other airlines.

Southwest expanded its market coverage gradually by first establishing a dominant position in the markets it already served. On the whole, its strategy has been to avoid direct confrontation with the major airlines of emulating their approach to service.

Southwest has been careful only to enter markets that fit with its operational capabilities. The airline does not employ the use of large hubs, for example. It does not operate in airports where landing fees are relatively high or are congested. It avoids third party distribution fees for its tickets. Its planes are all of a single type, which lowers cost for maintenance.

In addition, Southwest targets expansion to secondary airports where it does not have to compete with entrench airlines for limited gate access. In fact, the typically underutilized secondary airports are usually pleased to have Southwest enter the market.

The case of Southwest Airlines, as a start-up in a capital-intensive industry, can provide useful insight into a recently deregulated telecommunications market. Serving

complimentary or underserved markets is a good strategy for entry and a way to build presence over time. Prudent expansion is another. Innovative use of technologies or operational approaches can leapfrog competitors. And if possible, avoiding direct confrontations with established competitors is often effective as well.

By way of comparison, the telecommunications industry saw a widespread launch of CLECs, many attempting to gain large geographic footholds as quickly as possible. Clearly some telecommunications services were offered on a mass-market basis much too early. Early DSL implementations by Rhythms and Northpoint, with a relatively new production ready technology, coupled with numerous handoffs and touchpoints across providers left many opportunities for fumbles. Initial product offerings were for little more than basic high-speed transport, which proved very easy for established carriers (RBOCs) to emulate and even best in the marketplace.

In addition, initial pricing for DSL was very close to long-term marginal costs, a pricing approach other industries avoid for newly deployed products. In the case of DSL, higher initial pricing would have better moderated the overwhelming initial demand for the service, as well as generate revenues to provide necessary levels of service for still somewhat experimental product.

Once the bugs had been worked out (and visited only upon the early adopters, who are typically more forgiving of such glitches in new technology) the CLECs could have then begun to roll out their offerings on a wider scale with a better understanding of how and when they would become profitable. Further, there would have been more time to develop enhanced services, such as firewall for consumers or VPN for business customers that would have provided additional value and proved more difficult for the RBOCs to replicate.

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LIST OF ABBREVIATIONS

Term	Definition
3G	Third generation wireless, which enables high-speed connectivity for email and Internet functions.
ACS	Alaska Communication Systems (Incumbent Carrier)
APUC	Alaska Public Utilities Commission
ASP	Application Service Provider
ATU	Anchorage Telephone Utility
CLEC	Competitive Local Exchange Carrier
CO	Central Office
COLR	Carrier of Last Resort
CMRS	Commercial Radio Service Providers – e.g., mobile/cell phone operators
DS-3	Broadband connection with approximately 45 Mbps. Also known as a T-3, equivalent to 28 T-1 channels.
DBS	Direct Broadcast Satellite
DSL	Digital Subscriber Line
ERP	Enterprise Resource Planning
ETC	Eligible Telecommunications Carrier – enables a CLEC to qualify for USF funding.
FCC	Federal Communications Commission
ICT	Information and Communication Technologies
ILEC	Incumbent Local Exchange Carrier
IP	Internet Protocol
ISP	Internet Service Provider
IT	Information Technology
IXC	Inter-Exchange Carrier (Long Distance service)
Mbps	Megabits per second
MSP	Managed Service Provider
NCS	National Computer Systems
OSS	Operational Support Systems
POTS	Plain Old Telephone Service
PSTN	Public Switched Telephone Network
PUC	Public Utility Commission
QoS	Quality of Service
RBOC	Regional Bell Operating Company (formerly AT&T local service)
RCA	Regulatory Commission of Alaska (replaced the APUC)
T-1	Broadband link with 1.5 Mbps capacity.
UNE	Unbundled Network Element
USAC	Universal Service Administrative Company
USF	Universal Service Fund
VoIP	Voice over Internet Protocol – packet transmission of voice (as contrasted with conventional circuit switched voice transmission)
VPN	Virtual Private Network