Models for Sustaining *Rural* Broadband Networks

Rich Greenfield, Telak Consulting
P.O. Box 670929 Chugiak, Alaska 99567
907-947-7289;
richard.greenfield@telak.com

FINANCING RURAL NETWORK SUSTAINABILITY IS A COMMON ON-GOING PROBLEM

- Communication Networks
- Postal Networks
- Power Networks
- Transportation Networks
  (Planes & Trains & Roads)
- Education Networks

Traditionally, all of these networks and services have been heavily subsidized in Alaska; now they are all under financial stress - simultaneously!

WHY ARE RURAL NETWORKS SO DIFFICULT TO SUSTAIN?

- Represent relatively small markets with dispersed populations
- Lack well-developed infrastructure, e.g., roads, electrical grids, etc.
- Less diverse economies tend to falter in recessionary times
- Resulting in overall lack of jobs and high unemployment
- Leading to continued out-migration to urban areas.
- Top family priorities are food, housing, fuel, power, and transportation costs, and, <u>if at all and only then</u>, broadband

All this adds up to <u>the lack of a business case</u>:

- High cost of deployment due to distance & geography
- High cost of maintenance and upgrades
- Low penetration due to inability or unwillingness to pay

As a consequence of these problems, rural residents are inevitably late adopters in nearly every generation of technology. Now there is a potential tragedy of an even greater scale: the collapse of many rural networks in the next 2-5 years!

What Are The Traditional Approaches to Sustaining Rural Networks?

- Industry is given incentives (e.g., tax breaks & low cost loans) to invest in rural areas; and/or,
- Rural communities/households get special subsidies, *direct* or *indirect*, for network deployment and maintenance
- What models and mechanisms are used to sustain <u>communication</u> networks?
  - Both the U.S and Alaska have chosen indirect, public/private partnerships (P3s), i.e., industry collects surcharges on customer bills, monies are redistributed to industry, then companies offer lower pricing to eligible low-income customers

Broadband to the Rescue?

- Brings the magic of the network effect – puts the world in touch with itself (for good and evil!)
- Supports life-long learning through distance education and self-discovery
- Capable of creating tele-work and knowledge worker jobs

All this takes time & money!

While the benefits of broadband may not be enough to make Alaska's rural networks financially sustainable, broadband is essential to the future health of our rural community economies. We as librarians need to be capable of explaining this to all stakeholders; we need to become champions for broadband. To do that we need to know as much about the true benefits of broadband as possible and to take an active role in community economic development planning for better broadband.

Snapshots of A Few Funding Models

- Federal Funding in General
- Universal Service Funding Models
  - Federal Universal Service (USF)
  - State Universal Service (AUSF)
- Big Bang/Big Bucks Funding Models
  - Alaska Broadband Task Force
  - Alaska Power Cost Equalization Program

Federal Funding in General

(Pssss! Alaska is on the dole big time. Don't pass it on!)

- In 2009, Alaska received $14.2 billion in federal spending; AK was only 42nd of the 50 states - way down the list after California's $346 billion – but Alaska is usually first in per capita spending.
- In 2010, for every dollar Alaska paid to the feds, the state received back $1.93; for per capita dollars paid in taxes, Alaskans received back $2.69.
- In comparison, other states received $1.29 on average for every dollar in federal taxes paid (no wonder the federal debt continues to grow!)
- Among predominantly rural states, 81 percent received more federal spending than they paid in taxes. In contrast, 44 percent of urban states received more federal spending than they paid in taxes.
- Rural states, on average, received $1.40 in federal spending for every tax dollar paid; urban states, on average, received $1.10. (Rural states are defined as states whose urban population rate is below the national average of 79 percent.)
- In 2005, Alaskans got **$12,885.17 per capita in federal expenditures, when the national per capita average was only $7,223.**

http://www.motherjones.com/politics/2011/11/states-federal-taxes-spending-charts-maps
http://money.cnn.com/pf/features/lists/state_expend/percapita.html

Federal Universal Service Model

1) Predicated on "network effect": value of network increases with every household connected (today, *every individual* should be connected for maximum network effect)
2) Assumes that some individuals will always require financial assistance to access networks
3) Not federally funded but rather a cross-subsidy between economic classes which requires the majority of consumers to support a minority unable to afford access without assistance
4) Funding is collected by industry from customers and redistributed to industry to pay for above average costs (i.e., "high cost") and to subsidize low-income network subscribers.
5) Consumer surcharges are less visible than income and property taxes; nevertheless,
6) At a certain point (that of "surcharge saturation"), expansion of the contribution base becomes the only viable solution for increasing subsidies.

Surcharge saturation is just a euphemism for customer backlash when the charges on their bills simply get too large!

Why Is There Universal Service?

- Moral justification: "Do unto others as you would have them do unto you." – The Bible
- Patriotic justification: as a nation/state, "We take care of our own." – The Boss
- Legal justification: 1996 Telecom Act – "comparable," "timely," "reasonable" and "affordable" language – The U.S. Congress

When do telephone surcharges reach the saturation point? When does high cost support become unreasonable? When do subsidies become unaffordable to a state or nation?

We are about to find out.

Impact of Federal USF in Alaska

- In 2010, Alaska received $317.8 million in Universal Service support but paid only $22.3 million into the Fund.
- Alaska's telecom/Internet industry earns over a billion dollars in revenues each year, at least 20-25% of which comes from the federal USF as a cross- subsidy from other states to Alaska.

Federal USF support is what make the business case for most Alaska telcos – it is largely the difference between profit and loss!

Alaska's Federal USF Statistics

The majority of federal USF support to Alaska goes for sustaining rural and remote networks where the costs are the highest. In 2010, USF program funding broke out as follows:

Alaska High Cost	$218,970,000
Alaska Low Income	$26,829,000
Alaska Schools and Libraries [E-Rate]	$22,217,000
Alaska Rural Health Care	$49,729,000
TOTAL	$317,775,000

What's Wrong with USF & E-Rate?

- Over the last decade, the FCC has done little to explain the concept of universal service to the general public
- As a consequence, the nation has been reduced to a "givers" versus "takers" debate rather than a universal service debate
- The four USF funds are now capped but FCC Waste, Fraud & Abuse reforms are cutting into program muscle as well as fat
- E-Rate funding has not met demand for years, nor is it maintaining its achievements from the first 12 years of USF
- The FCC has been slow to expand the USF contribution base
- Broadband is not being accurately measured in rural Alaska:
  - The FCC has made a good beginning in distinguishing and documenting advertised versus actual speeds but…
  - Rural areas are victims of the 80/20 rule, i.e., the FCC spends almost all of its resources in measuring urban broadband.
  - There is no evidence that ANY broadband measurements have been taken in Alaska by FCC contractors.

State Universal Service Funding Model

- The Alaska Universal Service Fund was established in 1999 and currently collects about $15 million annually through customer telephone bills in support of five programs, including Lifeline and Public Pay Phones.
  - About $3 million goes annually to support low income household telephone access for almost 70,000 Alaskans
  - Other funding goes to subsidize high cost rural networks and Carrier of Last Resort (COLR) costs
- Under the National Broadband Plan, the Feds are shifting USF burdens to the providers or states
  - For example, the cap on high cost line charges and the limitation of Lifeline support to one phone per household (economic unit)

State Universal Service Statistics

- AUSF 9.5% surcharge on telephone bills generates $15 million per year
- An average consumer bill of $30 dollars includes almost $3.00 per month, or about $36 per year, for AUSF
- As of 2011, consumers must also pay a separate Network Access Fee of $3.69 per month in Anchorage (not including Eagle River) and $3.75 elsewhere, rising to $5.75 per month over four years.
- Alaskans who choose to pay just $13 per month for basic telephone service must still pay $15-16 per month in federal and state fees!

Can the AUSF be expanded

to support broadband access under these conditions?

My Telephone Bill

MTA

Long Distance Carriers

249393 MTA Long Distance	Out-Of-State	Effective 03/30/05
249393 MTA Long Distance	In-State	Effective 03/30/05

Local & Long Distance (907) 688-7167 **Account # 249393**

MTA LOCAL TELEPHONE SERVICE				
*LiteBlue Local Bundle			22.50	
*Residential Line			0.00	
*Caller ID			0.00	
*Anonymous Call Rejection			0.00	
*CFW Remote Access			0.00	
*Enhanced Call Waiting			0.00	
*Call Waiting Display			0.00	
*Speed Dialing			0.00	
*3 Way Calling			0.00	
*Last Call Return			0.00	
	SUBTOTAL			22.50
MTA OTHER LOCAL SERVICE				
Residential 10/12 Waiver			0.00	
	SUBTOTAL			0.00
TAXES, SURCHARGES, & ACCESS				
*Toll Line Access Charge			6.50	
*Network Access Fee			4.25	
*Anchorage Muni 911			1.50	
*Universal Access Surchg			0.01	
RTB Refund			0.75 CR	
Access Recovery Charge			0.50	
Rate Change *Network Access Fe		07/31/12	0.23	
July ARC Adjustment		07/02/12	0.03 CR	
*Local Regulatory Cost			0.19	
*AK Universal Svc Fund			2.56	
Federal Excise			1.12	
*Fed Universal Svc Chg			1.10	
	SUBTOTAL			17.18

TARIFF SCHEDULES, RATES AND SERVICES FOR MTA

MTA collects various taxes and surcharges each month that appear on your bill. Here is a brief explanation and rates for each charge.

Access Recovery Charge (ARC)

Description This federal fee recovers a portion of the costs incurred in the provisioning and maintenance of telephone service. It is administered by the Federal Communications Commission.

Rate $0.50 per residential and single-line business customers; $1 for multi-line business customers.

Effective July 1, 2012

Alaska Universal Service Fund (AUSF)

Description The RCA established the AUSF to promote universal telephone service in Alaska. This fund supports lower long-distance rates within Alaska.

Rate 9.5% on local, intrastate and mobile voice services.

Effective August 1, 2011.

Enhanced 911 Emergency System Surcharge (E-911)

Description The costs to operate the E911 emergency response systems are recovered through this surcharge. The money MTA collects is passed through to the Anchorage, Kenai, and Mat-Su Boroughs who build and maintain these public service systems.

Rate Per Line: $1.50 for MOA (Eagle River/Chugiak) customers; $0.75 for Mat-Su Borough; $1.50 for Kenai Borough (Tyonek) Effective June 30, 2011 for Mat-Su, October 1, 2005 for MOA, and July 1, 2011 for Kenai Borough.

Universal Access Surcharge (UAS)

Description The costs to operate Telecommunications Relay Service for the hearing and/or speech impaired are recovered by this Universal Access Surcharge.

Rate Per line: $ 0.01 for residential and single-line businesses; $ 0.02 for multi-line businesses

Effective September 1, 2011

What's wrong with AUSF?

- The 2011 increase in AUSF surcharges was completed by insiders (RCA & telcos) without much public input or subsequent recourse
- The cost of basic telephone service is more than double what subscribers would pay if they were exempted from federal and state fees, surcharges and taxes
- AUSF is nearing "surcharge saturation" and increased AUSF funding probably cannot <u>by itself</u> provide a complete solution to the growing demand for affordable broadband statewide.

Power Cost Equalization (PCE) Model

- The Alaska Energy Authority's (AEA) Power Cost Equalization program provides economic assistance to customers in rural areas where the kilowatt-hour charge for electricity can be three to five times higher than the charge in urban areas
- PCE improves Alaska's standard of living by helping small rural areas maintain the availability of communications and the operation of basic infrastructure and systems, including water and sewer, incinerators, heat and light.
- AEA determines eligibility of community facilities and residential customers and authorizes payment to the electric utility. Participating utilities are required to reduce each eligible customer's bill by the amount that the State pays for PCE.
- Regulatory Commission of Alaska determines if a utility is eligible to participate in the program and calculates the amount of PCE per kWh payable to the utility.
- http://www.akenergyauthority.org/programspce.html

How the PCE Was Funded

The PCE Endowment Fund was created and capitalized in FY2001 with Funds from the Constitutional Budget Reserve and the Four Dam Pool Project sale proceeds. The PCE Endowment Fund is an Alaska Energy Authority Fund managed by the Department of Revenue; it is invested to earn at least 7% over time. $182.7 million was appropriated to the fund in FY2007, and $400 million was appropriated in FY2011.

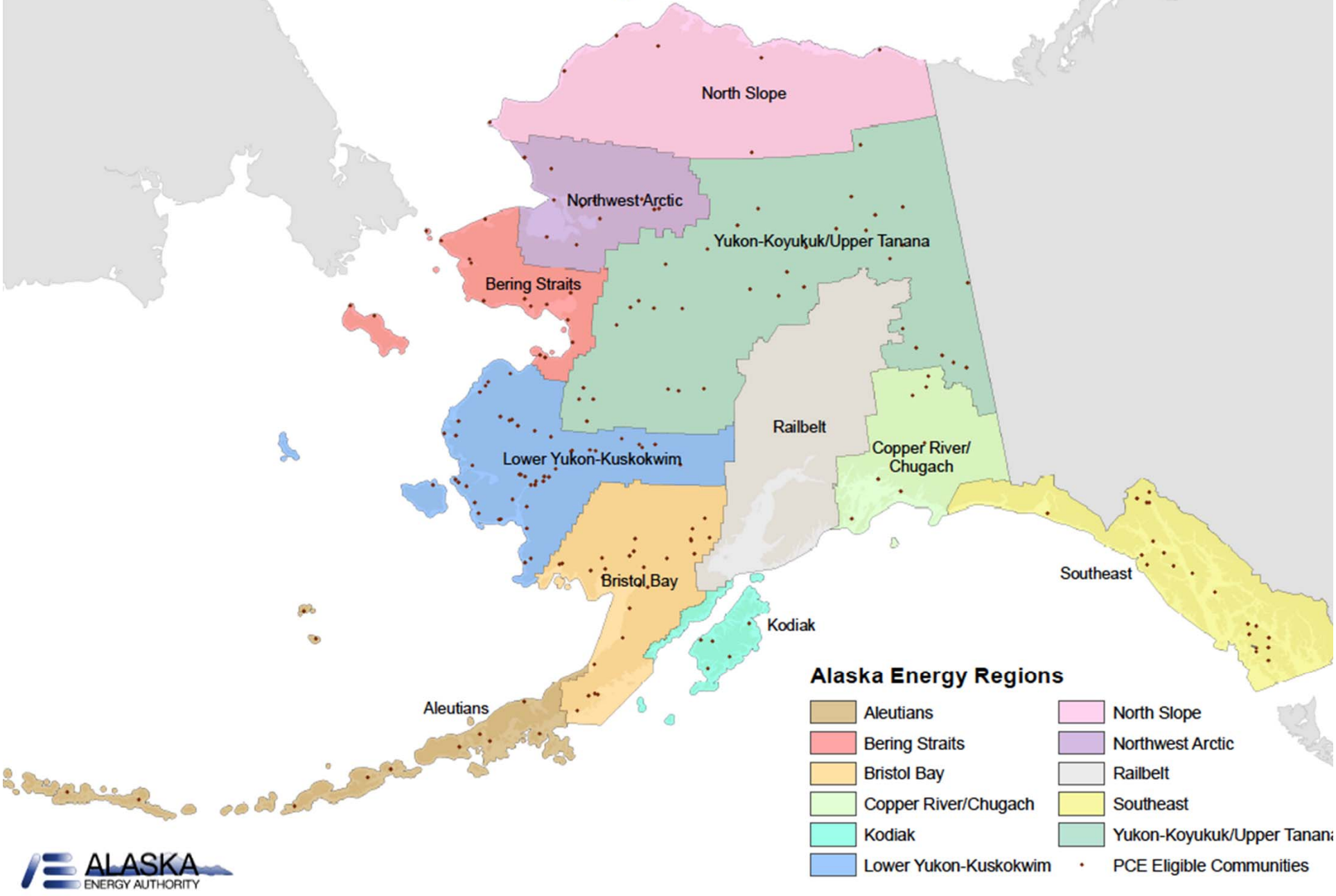
Current Status:

The estimated FY2012 costs for PCE are $34 million. For FY2012, the base rate was lowered from $0.1439 to $0.1342. The total program cost for FY2011 is $32.5 million. The PCE endowment's total invested assets were $729.3 million as of 10/31/2011.

Historically, PCE communities have used only 412 kWhr per household while Anchorage residents used 725 kWhr per household. In 2011, approximately 77,300 people lived in the 183 communities that participated in the PCE in 2011. In 1981, the power cost assistance program spent $2.2 million, in 1987 $17.7, and in 2012, a projected $34 million. (Subsidy programs seem to grow until someone puts on the brakes or the program breaks.)

Power Cost Equalization (PCE) Program

Eligible Communities



ALASKA ENERGY AUTHORITY

What's Wrong with the PCE

Criticisms include:

1. Instead of leading to lower energy costs, State energy programs have led utilities to depend on the State of Alaska for operating and capital expenses.
2. Fuel costs in rural Alaska remain artificially high.
3. High fuel price is caused by a lack of competition and/or regulatory oversight in the bulk fuel supply business in rural Alaska.
4. The Fund has not been self-sustaining, i.e., it requires periodic "full funding" from the State.
5. There is no end in sight.

Consequences of Current FCC Policy

Under current USF reforms, the $4.5 billion High Cost fund will shift $15.5 billion in the next 10 years to broadband support through the new Mobility and Connect America funds, which support digital broadband services in the wider sense (not just traditional analog or digital telephony) in underserved or un-served, low-income areas.

Because of limits on certain high cost support (e.g., $250 line caps), new restrictions on programs (e.g., Lifeline and Linkup), and economic models that don't fit Alaska, this federally mandated transition is already having a disruptive effect on the business plans upon which Alaska communication providers have built their economic models since the passage of the 1996 Act.

Alaska telecommunications are heavily dependent on USF monies; any sudden decrease or elimination of one or more USF programs could have devastating consequences in Alaska.

Major Cost Differentials Affecting Broadband Deployment in Alaska

- Lack of middle mile connectivity to many communities
- Distance to nearest network aggregation point
- Distance to nearest Internet access point (out of state)
- Geographic scale -- loop lengths and cost of transport
- Lack of road access
- Lack of power access
- Sparse population
- Short construction season
- Terrain & weather
- Labor constraints
- Take rate in Alaska

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Alaska Providers Are Fighting Desperate, Lonely Battles

Observations

- The ability of any national model to accurately estimate costs for Alaska is subject to the reasonableness of the input variables, including Alaska-specific costs for equipment acquisition, installation and maintenance
- In addition, any national model must be capable of accounting for unique regional features, such as long-haul fiber transport routes prevalent in Alaska
- ACS is receiving $19 million per year in high-cost support – the CQBAT model would *reduce* that by about $12 million per year, and eliminate it at the end of 5 years
  - Support for Alaska, Puerto Rico and the US Virgin Islands collectively would drop from $57.9 million to $8.8 million per year
- At the same time, LECs will be expected to increase broadband deployment to 85% of unserved locations in 3 years, and 100% of unserved locations in 5 years
- ACS estimates that the real cost of meeting this goal in the unserved portions of its LEC service territories is at least $75 to $100 million; another $50 to $75 million would be required to bring the FCC's target speeds to underserved locations
- If a model produces unreasonable results, the model cannot be deemed reasonable

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The Providers Need Us – Even GCI!

The importance of the quote below from an FCC ex parte filed on August 16, 2012, by Tina Pidgeon, General Counsel & Senior VP for Governmental Affairs with GCI, is that it shows how much GCI's broadband deployment strategies for rural Alaska depend anchor institutions like libraries, rural health clinics, and schools for their USF funding, not just for last mile connectivity, but for the shared middle mile terrestrial infrastructure now being deployed. Whether we like our broadband providers or not, we are all in this together: successful statewide broadband deployment depends on both communities, providers and anchor institutions, working together to find solutions to network sustainability.

> I also discussed GCI's major infrastructure investment in terrestrial middle-mile through its TERRA-SW and TERRA-NW networks. Funding for these networks were secured through a variety of means, including private financing, an ARRA loan/grant from RUS, as well as a grant from the Regulatory Commission of Alaska. I explained that anchor tenants participating in the Rural Health Care ("RHC") and E-Rate programs are essential to the ability to repay the private capital and RUS loans.
>
> We also discussed the success of the RHC program in rural Alaska, primarily attributable to a centralized applicant pool in the regional health corporations and the differential between the urban and rural rates for such services. I emphasized the importance of maintaining the primary RHC program, not only to provide the needed health services in isolated parts of Alaska, but also to help support expansion of terrestrial middle-mile networks that can be used to expand advanced broadband services to all consumers in a state with limited infrastructure.

Alaska Consumers Are Not Doing So Well Either

FCC policies fail to:

- Closely examine network management best practices with respect to oversubscription and contention ratios.
- Publicly recognize that most network services are shared and have explicit and implicit bandwidth "conservation" policies at work, e.g., "fair use" policies, data caps, throttling, etc.
- Seriously engage on the issue of affordability, e.g., the exorbitant cost of dedicated bandwidth, data caps with surcharges, and, above all, satellite bandwidth.
    - Realize that speed is not the only facet of broadband service controlled by higher pricing: throughput is controlled in the same way, i.e., pricing is not mbps/day (both speed & thruput)
    - Recognize that "best effort" contracts are still the norm for many anchor institutions and enforceable Service Level Agreements (SLAs) are still out of reach for most.

Major Obstacles to Any Solutions

1. There is still no clear understanding yet of what constitutes basic broadband service (and may never be) – it's not just speed!
2. There is a lack of clear regulatory authority over broadband, which limits potential solutions.
3. There is a lack of transparency in broadband network costs due to lack of regulatory authority over broadband pricing.
4. There is a lack of public understanding of and support for universal service.
5. There is a lack of political consensus to act.

Public Library Broadband = The Internet+

Broadband has given libraries additional missions which provide great visibility and utility:

- Broadband impacts practically all library services.
- Communities need broadband as never before.
- Broadband has given a new definition to literacy.
- Public libraries mediate and add value to broadband through training and expert advice.
- In hard economic times, public libraries are now the guarantors of public broadband access: in many rural areas, broadband stops at the public library!
- *While the Internet may be a greater resource than any individual library, by offering public broadband access, every library becomes an information resource that is greater than the Internet*!

Librarians to the Rescue: A Better Broadband Campaign

- Please spend time this evening and tomorrow thinking and discussing how community libraries can obtain better broadband at more affordable pricing
  - Given the sustainability models presented, none of which are perfect, think of how broadband in your community might best be maintained and expanded?
  - How would you structure federal, state and local broadband support mechanisms? How can we combine and coordinate support mechanisms?
  - What other creative ways are there to gain affordable access to broadband?
- If you are not already one, become a **broadband booster** in your community
  - Get involved with your local Internet provider and economic development agency to plan for better (less latency, more reliable & affordable) broadband
  - Work to make your community broadband-aware and digitally literate

Let's consider *Better Broadband* as a theme for AkLA 2014 , or at least a program thread, where we can share what differences broadband has made and train ourselves to be broadband boosters by developing a statewide program for broadband advocacy.

Let's get high on Alaska broadband!

Broadband + Libraries =Broadminds

Libraries

Build

Better

Brains.