



February 13, 2015

Idaho Department of Administration
Mr. Brady Kraft
PO Box 83720
Boise, ID 83720-0304

Re: IEN RFI Response

As one of north Idaho's largest independent internet and telecommunications providers, First Step Internet is grateful for the opportunity to comment on the Request For Information proceedings surrounding possible changes to the Idaho Education Network. It is not our intention to hit every point, but to concentrate on a couple of select issues that stood out to us as we read through the RFI.

It seems to us that both the RFI as well as the recent Invitation to Bid (ITB) put out by the Department of Administration betray a not-so-subtle bias on the State's part when it comes to the technologies used to deliver the kind of network that you seek. Many of the presented goals of such a network seem laudable, but at the same time may prove unrealistic since some of the goals appear to be contrary with respect to each other.

Under "Other Design Considerations," you list the following:

2. Fiber Ethernet: The state has emphasized fiber-based Ethernet as the best combination of technology and media for **cost** and **performance**. [*emphasis added*]

Amongst your "General Requirements," you list these things:

- a. High-bandwidth connectivity, two-way interactive video and internet access, using **primarily fiber optic** and other high-bandwidth transmission media;
- d. **High-quality, cost-effective** internet access and appropriate interface equipment to public education facilities; [*emphases added*]

In sections 6.4.18.1 and 6.4.18.2 of the ITB, the wireless microwave medium is described as "inferior" in contrast to fiber optics, and Ethernet as "inferior" in contrast to TDM (which is, strangely, in disagreement with the RFI's point #2 under "Other Design Considerations"), further enforcing the notion that the State has a clear and unambiguous preference for fiber above anything else, and implying that alternative options would not be seriously entertained if they were presented to you.

We would certainly not be foolish enough to contest that, if one were granted the most ideal conditions, and if the costs to maintain and operate were "no object," the fiber technologies of today can and will quite readily outperform just about any other transmission medium, in terms of sheer potential capacity. But what is *not* so clear-cut is the price-to-performance ratio

of fiber compared to other transmission mediums, especially when fiber is pitted head-to-head with them in particular climates and geographies. One cannot blindly make a sweeping statement like the one in the RFI – that "fiber-based Ethernet [is] the best combination of technology and media for cost and performance" – without first carefully considering the context of a given medium's use. Modern carrier-grade microwave equipment is capable of meeting all relevant metrics for a network such as the IEN, including quality of service, service level agreements, uptime, reporting, jitter, realistically useful capacity, and latency. Latency in particular can actually be better on a microwave system, as compared to fiber, owing to fundamental physical constraints: radio waves propagate through air faster than light propagates through glass, due to the index of refraction; and microwave links take a direct 'beam-line' path, while fiber is typically constrained to follow roads and other rights-of-way. Regarding performance versus fiber: in a recent test of the path from one of our Internet gateways, located in Lewiston, in the same rack as the CenturyLink/ENA handoff for St. Maries, to the Troy High School, we observed zero packet loss on 100,000 test packets, a minimum round-trip latency of 3ms, a maximum round-trip latency of 7ms, an average round-trip latency of 4ms, and a standard deviation of 0.2ms.

When available at a reasonable cost, fiber is certainly an excellent solution, as evidenced by the service we currently provide to the Moscow School District. At this time, we provide them with 100Mbps fiber-based service, for \$1000/month (of which e-rate covers 65%, leaving the District with a \$350/month bill.) This service is provided over a 1Gbps capacity link, which can easily and inexpensively be extended to 10Gbps or beyond. Compare this with the Moscow School District's IEN connection, provided over ILEC facilities with 155Mbps capacity, on which the State currently pays \$8,643.25/month for 24Mbps of service; more than 36 times what we charge on a Mbps/month basis.

In other cases, microwave can be a very attractive option. Take the NezPerce Joint School District as an example: The state currently pays \$8045.95/month for 15Mbps of service, delivered over 155Mbps fiber ILEC facilities. At the exact same location, we have 364Mbps BTOP-funded part-101 licensed microwave facilities available, which can be provisioned at a moment's notice, for the same rate that applies to the Moscow School District. That's less than 1/50th the cost of the current IEN connection. Similar situations exist for several other districts in our area, extending from Grangeville and Elk City on the south side, to St. Maries on the north; including Cottonwood (1/24th cost), Troy (1/40th cost), Whitepine (1/57th cost), and others. In all of these cases, our microwave network can provide far greater capacity, and equal or greater performance, all at a tiny fraction of the ILEC costs. We are not the only network in Idaho with this sort of capability either; dozens of other independent carriers and ISPs have networks in many regions of the state, which, once vetted, could be utilized for the IEN circuits, at a far lower cost than the current circuits. All told, the savings could easily be counted in millions per year.

The last question that the RFI poses under the "Other Response Requirements" section is this one:

n. How would you address growth in hard to serve areas?

As at least a starting place for an answer, we would put forward that, first, you have to begin by *getting your network out* to those hard to serve areas, something that we have been breaking our backs doing for the past few years. If the particular transmission medium that you prefer to utilize is simply not already available in a given area, and if it would not be cost-effective to bring it there (either on an upfront, cost-to-build basis *or* on an ongoing basis, taking into account recurring maintenance and circuit lease costs) relative to another medium that can still provide you with the performance metrics you desire, there is no compelling, rational reason to hold out for your initial preference. Fiber is not a panacea.

It is our belief that many people do not know or understand what the true capabilities are of today's carrier-grade wireless technologies, and view microwave circuits with suspicion because they view today's technologies through the same lens that they saw their first wireless network through over a decade ago, when in reality, wireless today is nothing like what it used to be, much like fiber today is nothing like what it used to be.

Furthermore, First Step believes that with the microwave loop that we are providing to the St. Maries School District by way of ENA to IEN, we have demonstrated that alternative technologies like wireless can not only meet your performance requirements, but can do so while also remaining both scalable and cost-effective. Sourcing a network like this from a single vendor has the effect of artificially inflating circuit costs by reducing competition or even eliminating it entirely. In fact, if you compared the direct cost of our microwave offerings to similarly-spec'd fiber loop services even in areas where you can get or *already have* a fiber loop supplied by an ILEC – that is, in areas that aren't necessarily hard to serve – you might find that we can still deliver equivalent performance to you at a much lower cost. And personally, as taxpayers, we think that this metric is the most important one of all.

Respectfully submitted,



Kevin Owen

First Step Internet, LLC