



Best Use of Coronavirus Relief Fund for Broadband following US Treasury guidance

We need to do the most good we can with this temporary funding. The age-old aphorism, "Don't let perfect be the enemy of good" is a cliché, because it is almost always correct. Unfortunately, fiber-optic projects of any scale are extremely unlikely to be completed during this calendar year.

This is because each of the following will take too much time: route engineering and splicing design, acquiring pole-attachment licenses from pole-owners based on making poles ready, and scheduling sufficient construction line workers and splicers. In addition, there is a nationwide shortage of fiber cable and other materials with very long waiting lists.

Therefore, the objective should be to get as many unserved and underserved students (both K–12 and post secondary), school staff, state workers, tele-health facilities, and the general tele-health public upgraded to full broadband (25/3 minimum) as soon as possible, before a second wave of virus-caused shutdowns occurs. Wherever 100/100 is possible, by all means prioritize it.

All subsidies for either ISPs or end users provided by this funding should be awarded based on a technology-agnostic standard with the following exclusionary exceptions:

- Services with very high latency such as geostationary satellite wireless
- Services subject to usage caps such as mobile and satellite wireless
- Services incapable of 25/3Mbps such as DSL, satellite wireless, and some fixed wireless

This standard should apply to (1)(C), (1)(D), (1)(E), and (3) of the committee's June 5 CRF memorandum.

To prevent the funding of non-100/100 technology from jeopardizing future 100/100 funding, use a version of this line: "Locations subsidized pursuant to this act, with technology not readily upgradable to 100/100Mbps, may not be used to disqualify any future, State-funded, 100/100 Mbps projects."

Low income individuals should be provided up to \$200 subsidies for installation fees and \$20 subsidies for monthly service subscription fees, during the calendar year.





As telecom and broadband providers are carrying similar bad debt to that of electric utilities, (1)(K) of the CRF memorandum should be applied equally to those bills.

Now, let's talk about that big bugaboo, fixed wireless. Generalizing about wireless is equivalent to generalizing about wireline. No one would dare say all cable is bad, just because some DSL is a disappointment. Likewise, no one should relate satellite wireless to mobile wireless to fixed wireless as the same. Even within each category there are important variations. First generation fixed wireless was an enormous improvement on dialup. Second and third generation fixed wireless was roughly equivalent to slow and fast DSL, respectively. Fourth and fifth generation fixed wireless is wonderful. Limits have not been reached.

So why does fixed wireless have a bad name in some quarters? Some early providers were just awful at service and support. That gave us other WISPs a bad name, which we overcame with exemplary service for our subscribers.

And then there was the big 2010 ARRA award. For a variety of reasons, many intelligent but technologically naive people invested too much hope in the hype of that service. It was designed like a mobile service with mobile equipment—lots of towers, but fairly widely spaced. The locations were a bit of a compromise, intended for fixed service to homes, but positioned to have enough coverage for mobile on the traveled corridors. The tower radios were very high-powered on exclusive frequencies but intended to serve end users on small indoor devices with mobile SIM cards and tiny antennas. This was unlike typical WISP fixed wireless with good-sized exterior antennas fixed to the building. The result was that service was good within shorter range of the towers, but required very large and very expensive external antennas to deliver good signal, if any, at a distance.

Conventional WISP operators admittedly coveted the licensed spectrum, but questioned the efficacy of this design from the start. I remember a lot of that came out in the open at a big public meeting at VTC Randolph in the early days. By then, we knew it was not a serious threat to our businesses, yet we didn't anticipate the negative fallout on our industry that would result in Montpelier.

Now there's a new generation of equipment available. If we upgrade to it, we'll be able to easily exceed 25/3. Some of this equipment achieves 80 Mbps. I am not talking about the "5G" millimeter wave radios, which some people fear. There's a new mid-band service called CBRS, which uses LTE and fancy antenna systems to deliver true broadband. There's low-band TV White Space, which plows through dozens if not hundreds of yards of trees and even bends





over hills. The subscribers do not rely on SIM cards and tiny antennas in phones, tablets, and routers to pick up the signal. Rather, they have dedicated, medium-size antennas mounted outdoors and always perfectly aimed at the tower. It works, and it works really well.

This committee has already heard about the joint project between Cloud Alliance and New England Wireless to bring broadband to the Burke/Lyndonville area from towers in each town. I was asked to provide a solution for the eight-school Kingdom East Unified Union School District. I, in turn, asked Luc Beaubien to partner with me. We are working with VELCO and tower owner Vermont PBS to get this built in short order using high-bandwidth, fixed wireless. From these two sites and possibly a couple of mini sites, it will serve many hundreds of locations including a majority of the list we were provided of unserved students and staff — this year.

Someday this solution may be replaced by fiber-to-the-premises. Should these students wait without internet, because it isn't 100/100 perfect? Will this investment be wasted, when the day comes that this equipment is not needed on these towers? The answers to both questions is a resounding no! Good fixed-wireless equipment can be redeployed where it can do good again. It's not twisted pair copper stuck on poles or monstrous, old satellite dishes in the back yard.

The Kingdom East project should be funded, but not as the only fixed-wireless pilot. There are six or seven active WISPs spread out in Vermont, each doing wonderful work. Almost certainly each could do more if they could put some of this new equipment up. The beauty is, they won't need permits to build towers. They can just swap equipment and bring much faster speeds to even more subscribers than they have now. Of course, it's not quite that simple. There's actually a lot of work, but comparatively speaking, that's the deal. I used to speak on behalf of the WISPs, but we cats don't like herding, so I will just give an example of what I would do. Suffice it to say that the proof of the value of fixed wireless (the pilot) should be spread around the state.

I can upgrade eight towers in central Vermont for about double the cost it will take to build the new WISP in Burke and Lyndonville. We could serve thousands of subscribers including many students and staff, etc. As a CVFiber board member, I would coordinate this installation with the needs of our CUD. In fact our recently completed feasibility study proposes doing exactly that. We anticipate building fiber within a few years to many of the same locations, but we know the good is good, the perfect will come, and then the equipment will get redeployed.

