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**Sent:** Wednesday, September 2, 2020 10:03 PM  
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**Cc:** Faith Brown <FBrown@leg.state.vt.us>  
**Subject:** [External] My testimony summarized

[External]

Here is the gist of my comments:

Absent coordination, "the market" doesn't always meet public needs, especially in cases when it's not profitable. The federal pandemic response left PPEs to states, without federal coordination, and that led to major problems. The telecom industry has lacked real coordination since the 1990s when it was transitioned from largely being a "utility" to being a "market" product. Competition brings great benefits, and works in many places, but Vermont was largely left behind as most of it was not profitable to serve without subsidies.

The uncoordinated market approach fails when there aren't enough competitors to make a market. The problem with the current federal approach to telecom and Internet service is that it is vertically integrated, with service providers expected to own their own physical facilities. Vertical integration was not the goal of the Telecom Act of 1996; quite the contrary, it introduced unbundling of facilities. But the FCC later adopted the vertically integrated model because it allowed its favored holders of the natural monopoly facilities to leverage them in order to monopolize the services provided over them. This also encourages wasteful overbuilding of physical facilities, when fiber has vast capacity and a single fiber plant could support multiple service providers.

A better model would be to recognize layering, with the physical facilities layer -- the fiber, copper, and wire center buildings -- to be a regulated utility, available on nondiscriminatory terms to providers of all types of services -- phone, Internet, and video. One way to approach this is to have a "LoopCo" that owns these facilities, starting with those originally belonging to the incumbent telephone companies. This is done in some countries. One ILEC, Windstream, spun out its loop plant to a separate company, now called Uniti, though it was not done to open up the plant but to give the shareholders a tax advantage, as the Uniti is a REIT. Admittedly getting a LoopCo model in a US state is politically a challenge but it could be a strategic goal, especially if a single outside plant met the needs of all of the service providers. Perhaps the CUDs could play a key role at that layer.

With regard to Senator Brock's question about long-term planning, the farther out one looks, the more the underlying assumptions will change before they become real. Both the supply -- technology -- and demand -- applications -- change. Federal policies and subsidies also come and go. Thus 10 years is necessarily a soft-focus view, but 3-5 years can be an action plan and 10 years can be an aspirational vision that is subject to periodic revision.

As to what CUDs most need, of course CUDs need access to low-rate funding; they also should

get unbiased expert help, not from a biased technology vendor, in order to successfully start up and reduce risk. They can't have actual veto power over what competitors do, as that would be de jure monopoly, which is bad, but they should be consulted vis a vis subsidies. as multiple subsidized competitors is usually wasteful. But with only one subsidized player, there is little room for competition, and thus the monopolist needs to act like or be regulated more like a utility and be fully open. CUD fiber should be open access, not limited to any one service or service provider. Offering "the Internet" is not open access; it needs to be at a lower layer, ideally strands.

This raises a question about the actual role of CUD -- is it to make a profit on its own business, or is it to facilitate the availability of adequate services at reasonable prices? When I did a budgetary design for CVFiber, the Phase I goal was to bring service to those who are not yet served, those not yet on cable or other high-speed access. It had to have acceptable financial numbers, so fiber couldn't reach the most isolated users, but it focused on those who were too spread out for the cable companies to want to serve. It might be more profitable to overbuild Comcast and Charter in high-density areas, but we saw the goal as to get everyone good service, and that might be as much to facilitate as to provide service. A friendly resale agreement with VTel would have helped, but that idea fell victim to a legacy of bad relations.

In meeting short-term needs, fixed wireless is usually the fastest way to add good-quality (25/5) service to areas not near existing cable or fiber. The long-term goal of course is to get fiber to as many homes as possible. Fixed wireless thus serves an interim purpose of providing service to those who are not yet on fiber, including those who may be so remote that fiber is simply not going to reach them in the foreseeable future. This latter category may include for example off-grid areas with more camps than year-round houses. But once fiber is in place to a neighborhood, the vertical assets installed for fixed wireless may still be useful for extending mobile coverage into otherwise unreached areas, something like what the old VTA tried to do with unsuccessful technology. Newer LTE small cells may be a better way to do that. These poles can also support additional receivers for first responder two-way systems.

Cell phones aren't themselves really a substitute for broadband. Fixed and mobile wireless networks are usually different, though they can share infrastructure. But there are two types of places that seem to support common fixed and mobile networks. One is the very remote areas where a mobile network, built to provide initial coverage, has spare capacity that can also support a relatively sparse fixed population within its range. VTel's network works this way, and their new Massive MIMO sectors will support many more homes than the older network could. AT&T is even doing this to meet its wireline units' 10/1 CAF obligation in some remote areas in some southern states. At the other extreme, "5G" is the industry buzzword for technology primarily aimed at urban densification of the mobile network, and which Verizon and AT&T are hoping to use in urban core areas instead of providing fiber to the home. I am skeptical that this will suffice; urban areas are where fiber makes the most sense, and radio systems have capacity limits. In the big middle range, suburban and some higher rural population density, fixed and mobile wireless are less likely to share the same radio access network, though they could share vertical assets and backhaul.

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