Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of:	)
	)
Inquiry Concerning Deployment of Advanced	) GN Docket No. 17-199
Telecommunications Capability to All Americans	)
In a Reasonable and Timely Fashion	)

COMMENTS FROM THE COLORADO STATE BROADBAND OFFICE REGARDING THE DEPLOYMENT OF ADVANCED TELECOMMUNICATIONS SERVICES

These comments are filed by the State Broadband Office ("SBO") within the Colorado Governor's Office of Information Technology ("OIT") and represent the positions and perspectives of the SBO staff.

I.   INTRODUCTION

The Colorado SBO appreciates the opportunity to comment on this Notice of Inquiry ("Inquiry") related to the Federal Communication Commission's ("Commission") efforts to update and improve the methods for determining progress towards the goal of universal broadband access. As a state with significant geographic challenges many of our comments reflect the experiences in working to both understand the scope of the issue and identifying potential solutions. The SBO has been actively working towards universal broadband access within Colorado since 2012.

II.   Evaluation of Fixed vs. Mobile Broadband

The Commission's discussion and questions related to fixed and mobile broadband are timely and salient. As a general practice, the SBO believes that both fixed and mobile services are crucial to any given community's well being. While a number of citizens do utilize mobile broadband as their primary medium for accessing the internet, we believe the effort to reach

universal broadband access should focus on maximizing the number of home and businesses that have *fixed* access. Given recent trends for bandwidth consumption, the SBO believes relying solely on mobile access would offer a limited experiences for end users, especially in rural areas where mobile service is often degraded due to a variety of factors. That said, extensive and quality mobile coverage is also crucial to communities economic development and public safety. Whether it's remote offices or tourist-based economies, the ability for consumers to maintain mobile communications when traveling in and through communities has become an expectation. The SBO would emphasize that it supports the position that fixed-wireless is a viable alternative for fixed connections in addition to traditional wired implementations. While we believe maximizing the number of homes and businesses with fixed wired service (preferably fiber) is the ideal solution, in many states (Colorado included) universal wired connectivity is not practical in the immediate future, and potentially ever. The key for fixed wired services is to establish a set of engineering and performance guidelines that must be met by fixed wireless providers to ensure their service adequate for consumers to rely upon.

Given this position, the SBO agrees with the commission that it should track all appropriate technologies and include them in the report. It also agrees that the commission should evaluate mobile and fixed as 'separate and distinct' as each technology has its own set of advantages and challenges. We agree with breaking down coverage into the three categories, *both fixed and mobile, fixed only and mobile only*. However, the SBO argues that any metric used to track and report overall broadband availability should be drawn from the fixed only category. Incumbent carriers often use the justification that an area is already served to limit public investment. Including mobile broadband as an acceptable form for residential coverage would limit many

state and local efforts to invest in modern fixed infrastructure. While mobile broadband is a viable mechanism for many applications as stated, the SBO believes the ultimate goal of the nations broadband effort should be to maximize the amount of fixed infrastructure to homes and businesses.

III. Metrics and Benchmarks

Fixed Service Benchmarks

The SBO supports maintaining a fixed benchmark speed for advanced telecommunications capability, currently at 25 Mbps/3 Mbps. We believe this threshold represents the **minimum** speed to support current applications and usage patterns and also agree that the Commission should be upgrading the benchmark as technology advances. We also agree that latency is a key measurement as well and the commission should follow the latency guidelines associated with full-duplex, real-time voice capabilities.

Regarding additional metrics, the SBO would propose that the FCC request data from providers on the percentage of time customers actually receive the throughput they are subscribing to. What we often see in both urban and rural areas is that customers receive the 25/3 threshold only occasionally or during non-peak times, which satisfies the technical requirement but from a practical perspective receives far less than the minimum on most occasions. Perhaps the commission would require the measurement of throughout speeds during peak hours and set a threshold (say 80% of customers) that a provider must be able to ensure delivery of full capacity to subscribers in a given area. Especially in areas with limited providers network congestion and oversubscription should be addressed as it degrades the users usable product. The SBO believes

speed tests and other crowd sourced data can be used to better represent the functional network footprint versus the advertised footprint.

Wireless Service Metrics and Benchmarks

The SBO supports the Commission in establishing a benchmark for mobile services. As stated earlier, mobile connectivity is a critical compliment to fixed access for communities and those communities should have a mechanism for determining how their service compares to others. While we have no quantifiable data, the SBO supports the Commission's proposition that a 10 Mbps/1 Mbps connection constitutes mobile wireless broadband. Given this benchmark, the Commission is also correct that mobile connectivity is much more complicated and variable than fixed access. The SBO also agrees that standardizing based on LTE coverage is a positive step as older technologies are quickly becoming obsolete and do not provide the same experience.

Framework for Updating Benchmarks

The SBO agrees there needs to be a mechanism for reviewing the connectivity benchmarks in an ongoing basis.   The speed benchmark should set a standard that is meant to be achieved, not something that looks at what is the 'minimum' amount of connectivity. The Commission should take into account macro trends in technology that will push bandwidth consumption and set the benchmark to reflect that. For example, in 1996, the average computer had 8 MB of RAM, today it's 8GB, a 1,000% increase. As we find ourselves fully within the era of cloud and network computing it is not unreasonable to expect the same increase in connectivity as we saw with memory during the prime years of the desktop computing.   When looking at connectivity for households, the Commission must also factor in the number of individuals that are often in a fixed location. While the approach of determining the necessary connection for a variety of tasks

(as the Commission discusses) it must also factor in the fact that an average home will have multiple users of standard applications.

The SBO agrees that using the 'subscribed to by a substantial majority of residential customers' has merit however to include this in its review, the Commission would need factor in cost of service as it's a determining factor in this approach. Subscribers are often limited to what a provider has to offer for a specific price that may or may not meet their bandwidth needs. Providers will push subscribers to the most appealing product for their purposes, not necessarily what is the ideal amount of connectivity. Many subscribers would subscribe to higher speeds if the cost was reasonable. The Commission must ensure the bar is not set too low simply because users can't afford (or don't have access to) the level of service they want.

Deployment of Advanced Telecommunications Capability to All Americans

The SBO believes the Commission's proposal to measure year-over-year progress would be a good step to identify trends but we are concerned at the intent to use census block data. As one of the states that has continued its broadband mapping efforts Colorado has determined that census blocks are unreliable measures of availability and can drastically distort the actual availability versus what carriers report. Colorado has begun using the Public Land Survey System (PLSS) as a baseline and is seeing positive results. Unfortunately this mechanism is not established in all states and therefore cannot be used on a national basis. That said, the SBO believes breaking moving away from census blocks is an important step to truly understanding broadband availability. Many of the proposals outlined in the Commission's recent Form 477 NPRM (WC Docket No. 11-10) on the form 477 data collection process begin to address this issue and hold promise. The concept of identifying availability at a street segment level could

lead to much greater granularity. Especially in rural counties, the disparity between urbanized clusters and unincorporated areas is quite stark. Assuming the FCC adopts such efforts to increase granularity perhaps the commission could develop a mechanism to address this differentiation in their metrics by including more than a single availability metric with the inclusions of metrics focused on rural and unincorporated areas.

Schools and Classrooms

The SBO believes the Commission's focus on identifying school connectivity is crucial and should continue. The SBO believes the current standards set for by the State Education Technology Directors Association (SETDA) combined with the efforts of groups like Education Superhighway provides an excellent benchmark of school needs and should be incorporated in the annual report.

Additionally, the SBO believes the Commission should also incorporate other critical institutions, such as health care facilities into the annual report. As with education, abundant broadband is becoming critical to the operational of modern healthcare, especially in rural areas where capacity is often lacking.

IV. Data Sources and Analysis

The SBO has reservations about using census blocks to determine broadband availability. Especially in western states, where census blocks can represent hundreds of square miles this methodology leads to distorted results, often confusing citizens and policymakers. In order to get an accurate representation the Commission must collect data at a much more granular level. The SBO will address this issue more in depth in the Form 477 NPRM but believes the discussed

approach of using road segment based data has potential to address this question. As with the issue of mobile benchmarks, the SBO believes the Commission should factor crowd sourced speed data into all technology metrics including fixed. As one of the states that has continued their broadband mapping efforts and integrated speed tests we believe this data is very valuable when used properly. We further believe that for those states who maintain their own mapping/data programs the Commission should integrate their efforts in the annual report process.

Deployment data for mobile services

Quantifying the deployment data for mobile broadband is complicated. While basic propagation maps can give a general picture, the actual performance is often much more nuanced and varied. While we agree that the FCC should continue to use the 477 data (given potential changes as outlined in separate order), SBO believes to get an accurate view we must overlay population data below the census block level to get a true understanding. The SBO agrees that identifying the actual geographic coverage of a census block is more accurate than the centroid model; however, simply stating that a census block is 65% covered and therefore 65% of the population is covered is misleading. In this model, entire communities could (and do) fall through the cracks when it comes to identifying and solving mobile connectivity issues. Additionally, the SBO believes the Commission should set minimum thresholds on engineering parameters (RSRP, RSRP, etc.) as providers can adjust these to dramatically overstate usable coverage, especially in rural areas. We currently see providers claiming to have coverage in areas based on the mere existence of signal rather than reliable and consistent connectivity. Establishing a

minimum set of thresholds would go a long way to provide public transparency into the complicated issue of wireless networks.

What can the commission do

The Commission closes the notice by asking the poignant question 'What additional efforts should we undertake' to increase the deployment of broadband networks. The SBO would take the position that the commission should focus its efforts and resources on increasing the deployment of new infrastructure rather than attempting to 'upgrade' potentially antiquated infrastructure. Prior commission efforts have focused on 'reusing' infrastructure that has in many cases, exceeded its useful life. The commission should focus its investment on infrastructure that will support future technologies that can scale to the rapidly increasing demands without further public investment. In order to meet the long-term needs of rural communities we need infrastructure that will allow for new and emerging technologies to capitalize on. Infrastructure put in place 50-75 years ago has served us well but has realistically come to an end of it's useful life given the pace of innovation in the communications marketplace.