

**Prepared Remarks of FCC Chairman Tom Wheeler**

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As the excellent work in the National Broadband Plan called to our attention and as evidenced by the President's Broadband Opportunity Council's continuing work, broadband is the defining infrastructure of the 21<sup>st</sup> century. Broadband networks facilitate today's economic and social activity. But, even more importantly, broadband networks ignite new possibilities. Thanks to broadband, what is often unimaginable today becomes integral to life tomorrow.

Today, the largest taxi company in the country doesn't own any vehicles, the largest overnight lodging company doesn't own any hotels, and the fastest growing of the top-10 retailers has no showrooms. What they do have is easy access to a broadband network, which enables them to assemble resources in new ways, present them to the public in new ways, and define an economic future that is task-based as opposed to the production-based economy of the pre-broadband era.

We should not overlook as well that broadband is also an ignitor of more broadband. As the success of broadband services increases the demand for broadband, it also increases the incentive for competitive broadband

It is because of this two-pronged impact of broadband that our policy is to expand broadband and to assure that our broadband resources are fully utilized. That means that we want to extend broadband geographically into areas where it doesn't exist. It means that we want broadband to be affordable for and adopted by all of our citizens. And it means that we want broadband to be open and free from any artificial inhibitions on its use.

So here's the punchline. It's pedal to the metal on broadband policy – for both consumers and competitors.

Expanding broadband requires better network technology. It requires more competition. It requires that companies continue to invest to satisfy consumer demands for bigger, better, and more broadband. It requires that broadband providers not be able to limit competition in broadband-dependent markets, like apps or online services, by invoking their gatekeeper power. And it requires that limitations on consumer demand – whether on the basis of geography, or economic circumstances, or disability – be removed. Simply put, broadband should be available to everyone everywhere.

My message today is simple: the job of the FCC is to exercise its authority with both discretion and determination so that technology, competition, investment and consumer empowerment are able to work together to reach our nation's broadband goals.

As you probably know, I think history matters – a lot. So let's consider history.

Networks have been a defining economic force throughout history – and the victory laurels have gone to those who embraced the new networks.

The exciting part about our time is that while broadband and the Internet may be the most important networks in history, their effects are not yet the most important in history. The simultaneous emergence of the mid-19<sup>th</sup> century railroad and telegraph networks reshaped the economy and society of that time more than the Internet and all that it has produced has shaped ours – thus far.

The key phrase in that statement is “thus far.” My conviction that we are on the cusp of when our broadband networks will prove even more transformative than the networks of the 19<sup>th</sup> century is based upon this: broadband networks are new in a new way.

The new way is the evolution from hardware-based networks to ones that are software-based. The effect of this is the virtuous circle where new applications are enabled by broadband, which drives the next generation applications and the next generation broadband.

There are multiple benefits of the network’s evolution from hardware to software. First, we are moving from networks with limited functions, to a world in which software expands network capabilities and makes them available to a wide variety of non-traditional applications. As one person recently put it, networks are moving from a SIP world to an API world. The result will unleash innovation in both the network and in applications.

Another impact of software replacing hardware is that the cost of expanding network capabilities decreases. In the old days it was necessary to add a physical circuit if you wanted to increase capacity; today it often is only a matter of adding computing power.

Finally, the evolution to software defined networks with virtualized components means that network operating expenses decrease. Verizon, for instance, reports that the replacement of central office physical switching systems with software reduces their real estate costs by up to 80 percent. What used to require floors and floors of switches can now be done by a few racks of computers in a fraction of the space. And the same holds true of energy costs. Powering a few computers can save up to 60 percent on energy costs as compared to powering endless switches.

With all of these advantages of software defined networks – expansion of network capabilities, economies in expanding capacity, and reduction in operating costs – no wonder AT&T has said 75 percent of its network will be controlled by software within five years.

But this is not just about reducing costs and increasing functionality for incumbents. The effects of software-based networks are also good for consumers and competitors because they enable LECs to become more fulsome competitors to cable operators’ dominant position in high-speed broadband.

Thank you Gordon Moore.

Fifty years ago, the Intel co-founder posited what has become known as Moore’s Law; that the power of microchips would double, and thus computing costs decline, about every two years. The compounded

doubling every couple of years has meant that the 60 transistors that were on a chip when Moore propounded his theory has exploded to over a billion while the cost of a chip has remained relatively stable.

We tend to think of Moore's Law in terms of how the smartphone in our pocket or purse has as much computing power as a multimillion dollar super computer of just a few decades back.

But Moore's Law is also what is driving the revolution in network economics as ever-less costly computing power magnifies the capacity of network connections. For optical fibers, of course, the result is optimal. But even for bandwidth constrained copper networks, low cost computing power allows transmissions to be broken into parts and sent over different strands to be reassembled at the other end. And the same concept, called carrier aggregation, is increasing the throughput of wireless networks through increased processing power.

That the nature of the network itself is changing right under our noses is a significant data point for those of us in the oversight business. As the cost of delivering broadband goes down, the opportunity for broadband expansion – including competitive broadband expansion – and broadband-dependent innovations goes up. This means we're not going to let imaginary concerns about investment incentives and utility regulation cause us to let up on policies to encourage fast, fair, and open broadband.

Since we come together today on the heels of the D.C. Circuit's decision rejecting requests to stay the Open Internet Order, let's begin by addressing the relationship between broadband network openness and investment. As you know, this was a big argument by the ISPs in their stay request; that somehow assuring that networks are open would erode the incentive to invest.

Fortunately, there is a disconnect between what is said in Washington advocacy and what happens in the market. While a few Big Dogs are threatening to starve investment, others are stepping up. The CEOs of Sprint, T-Mobile, Cablevision, Charter, and Frontier have all publically said Title II regulation does not discourage their investment. Recent transactions, both announced and rumored, point to the same conclusion. And, of course, the post-Open Internet announcements by AT&T, Bright House, CenturyLink, Cincinnati Bell, Comcast, Cox Cable, TDS Telecom, and Time Warner Cable about their plans to expand their broadband service certainly speak for themselves.

Yet, there are a group of broadband providers who feel that the movement from analog to digital transmission should be their ticket to escape what I've called the Network Compact: those responsibilities that have always governed the relationship between those who build and operate networks and those who use them. Access, interconnection, public safety, consumer protection and national security will remain our focus.

Here is a simple statement of fact. Broadband is the most powerful and pervasive network in the history of the planet. Suggestions that it be without fully effective oversight are unthinkable.

But the kinds of oversight designated by the Open Internet order are a new regulatory model designed for new network times. I keep describing this oversight as a "referee on the field who can throw the

flag.” In our implementation, I plan to adhere to the wisdom that the best referees do not make themselves part of the game unnecessarily. As a disciple of Woody Hayes and Urban Meyer, I believe the players should be allowed to play. Referees make sure the game is played fairly, they don’t call the plays. It will be up to the competitors, for instance, to advocate for themselves in negotiations with other competitors. Our job isn’t to substitute the FCC for what should be hard-fought negotiation and tough competition. It’s up to the players to compete hard against their opponents. But, make no mistake, if they violate the rules, we will blow the whistle.

We are arbiters of last resort, not first resort. We will not micromanage networks as was done in the pre-broadband days. This means no retail rate regulation, no network unbundling, and no tariffs. In short, no “utility style regulation.” In that environment, at a time when consumers are demanding better broadband, why would a rational broadband provider not make the investment to give it to them? Only if competition is lacking, only if consumer demand is artificially limited. Companies invest to win the race of competition...if there is a race.

As we push onward into the broadband future, our challenge continues to be assuring that the preconditions for broadband ignition are as widespread as possible. The best tools for accomplishing that are competition and consumer demand.

So let’s be clear. We’re not going to let up on protecting and promoting broadband competition.

As I have made plain on innumerable occasions, competition is paramount. It is the best assurance of industry dynamism, that opportunities for improvements in quality and reductions in cost will be pursued assiduously, and that the benefits will be shared with consumers.

Suffice it to say, continuing to protect and encourage a competitive marketplace is the foundational requirement of the modern FCC. Our skepticism about the competitive impact of the rumored Sprint-T-Mobile merger of a year ago, and the recently abandoned Comcast-Time Warner Cable merger are evidence that we take seriously our responsibility to protect competition.

But protecting\_competition is only half the equation. Our job is to promote\_competition as well. We know broadband competition works – just look at cities such as Kansas City, Austin, Lafayette, Atlanta, and Chattanooga. The arrival of even one well-equipped broadband competitor caused a significant competitive response from incumbent operators, with qualitative improvements benefitting customers of incumbent and insurgent companies alike.

The Commission will continue to look for ways to promote broadband competition. One way is to lower some of the costs of extending broadband facilities. We dealt with the inability of competitors to get access to poles and conduits in the Open Internet Order. Building on that, we are now undertaking an effort to better align the costs of using poles and conduits.

Perhaps the FCC’s most tangible role in growing broadband is to allocate and make available both the licensed and unlicensed spectrum necessary for competitive wireless broadband. Our use of auctions – a competitive device in its own right – for assigning licensed spectrum is well known and, in most

quarters, well celebrated. Making available spectrum for unlicensed use draws less public attention, but as the remarkable success of WiFi demonstrates, it literally is an indispensable element in the provision of broadband today. And if “more indispensable” is a permissible concept, it will be more indispensable to the broadband of tomorrow.

I have recently spoken to Chairman Walden under whose leadership the Incentive Auction law was created. We are of one mind on this: there will be an Incentive Auction in the first quarter of 2016.

When I came on board at the agency the question of whether broadcasters would show up for the Incentive Auction was a matter of debate. While, of course, this is a voluntary decision by each broadcaster governed by the ultimate free market – an auction – I am quite encouraged by what we have been hearing from broadcasters.

While we are talking about spectrum we should not overlook the role it will play in determining who will be the international leader for 5G broadband networks. This nation is the world leader in 4G-LTE as a result of the availability of spectrum to become a home for LTE. We do not intend for the United States to lose the pole position in the international broadband race. We will maintain that leadership in the same way we obtained leadership in 4G. First, through being out front in allocating appropriate spectrum. And second, by allowing carriers to deploy 5G service in any frequency band they find suitable.

Another way to stimulate broadband is to increase opportunities for additional competition in upstream markets. That is why we proposed a rule to give over-the-top video providers the ability to choose the same business model as cable and satellite providers, with the same program access rights. We expect to move that to a Report and Order this fall. There is a line of new OTT providers queuing up to expand video choice – and increase consumer demand – for broadband.

Demand for broadband also is affected by consumers’ perceptions about the potential non-monetary costs of using it. We committed in the Open Internet order to address issues of privacy implicated by consumers’ use of the Internet. We will begin that process with a Notice of Proposed Rulemaking in the autumn.

And, finally, let’s be clear. We should not and will not let up on our policies that make broadband more available.

Converting universal service programs from their narrowband origins to broadband is among our most important initiatives. Chairman Genachowski began the reorientation from support of narrowband service to a focus on broadband. We have built on that by deploying \$10 billion over six years to enable 10 rural price cap carriers to provide broadband service to their customers. We have also begun a program to test non-traditional means of delivering broadband in rural areas.

I have told Senator Thune that it is my goal to similarly reform the broadband support program for small rate-of-return carriers. Commissioner O’Rielly has played a significant role in this effort, including putting forth a set of principles. We are working with the affected carriers to explore the best approach.

We had been in search of a consensus proposal from the rate of return carriers that would help us meet the policy objectives the Commission unanimously adopted in April 2014. Unfortunately, while I appreciate the carriers' willingness to engage, if we are to keep on schedule, time is not our friend. Absent a consensus from the parties involved we will put forth our own proposal.

Just as we need to make sure that all parts of our country have broadband, we need to make sure that all of our citizens are able to use it.

Last year we modernized and expanded our efforts to address the broadband needs of schools and libraries. Our modernization of the E-rate program will produce an extraordinary return on investment and it will do it very quickly.

But learning isn't confined to the classroom. As Commissioner Rosenworcel has pointed out, even though students can now connect at school, too many still experience a "homework gap" when they cannot get online at home. A recent Pew Research Center study found five million students – nearly 20 percent of students between six and 17 years-old – do not have high-speed Internet service at home. It is simply unacceptable in an era when learning opportunities have never been richer or more available that these students have to go to McDonald's or some other WiFi-equipped location to do their assignments.

Our obligations and opportunities to extract more value from broadband do not end with our children. Another Pew study found that half of Americans who rely on smartphones for broadband access have had to cancel their mobile subscription because of financial hardship. Commissioner Clyburn has been championing the need to overhaul the Lifeline Program to make it relevant to the 21<sup>st</sup> century. I support her efforts, not only to rid the program of components that invite waste, fraud and abuse, but also to refocus Lifeline from voice service to broadband. We have recently adopted a NPRM to overhaul Lifeline. We will learn from that Notice and then move on to reform and revitalize Lifeline.

Broadband access is very important to another group of Americans, those who live with physical and intellectual challenges. Although our efforts do not receive headlines as much as some of our other activities, the application of information technology to attack the needs of Americans with disabilities will be a priority as long as I am chairman. We are, for instance, the first federal agency to harness broadband to allow those who use American Sign Language to communicate directly with the FCC using online video.

Several months ago we began urging all federal agencies to have online video ASL capabilities. To aid in this, the FCC is building a Web-based open API platform that will allow any company or agency to "plug in" and utilize the power of broadband to do a simple thing: help hearing impaired Americans communicate. The 25<sup>th</sup> anniversary of the Americans with Disabilities Act is coming up next month. This is a great opportunity for all federal agencies to take the simple but significant step of harnessing online video for those who speak with their hands and hear with their eyes.

As I noted at the beginning of this presentation, we are closer to the beginning of the broadband networks' promise than the end. The broadband-related agenda I have described is keyed to assuring

that the technology's remarkable promise will be realized. If we succeed in accomplishing the agenda, and I am determined that we will, new generations of American innovators will be able combine their technical abilities and entrepreneurial instincts with broadband's capacities to produce great things – things that today we cannot begin to imagine.