Unlicensed Spectrum Success -- Lessons for the Next Chapter in FCC Spectrum Management

Remarks of FCC Commissioner Kathleen Q. Abernathy
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Thanks for having me here today - and thank you David and Scott Harris back in Washington for organizing today's event and the fine introduction -- I also want to put in a plug for the Federal Communications Bar Association -- which paid my way to the west coast.

I have been at the FCC for about a year now. When I arrived at the Commission -- after stints in wireless, satellite, incumbent and competitive wireline telephony businesses as well as prior government experience -- I had a pretty clear set of general regulatory principles. Those principles continue to prove useful --- BUT over the last few months I have devoted significant energy to organizing and honing my views on spectrum policy. There is a reason so many Commissions have struggled with this issue -- ITS HARD!!!! But as my husband says -- you don't get a Nobel Prize for figuring out how to program your VCR. So in that spirit—regardless of how difficult this issue is—I believe I and the FCC have an obligation to tackle it.

My remarks today will focus on four areas -- first why spectrum policy is important; second what are the contours of the spectrum policy debate and the FCC's role; third, the key values and considerations I believe

should guide that debate; and fourth, where we go from here. My remarks today will focus on unlicensed spectrum policy. Saturday at the FCBA's retreat I will address the licensed service policy issues. Together they will provide a framework for my consideration of spectrum issues, give advocates some sense of where my thinking is, and hopefully contribute to the larger debate that is raging on the Hill, in industry, and as a part of the FCC's own Spectrum Policy Task Force.

<u>Why is spectrum management important?</u>

I am sure that most of you in this room could readily answer that question. But explicitly identifying the answers should help to guide and focus the spectrum debate.

In my view, spectrum is important because it is a finite natural resource with immense potential value to the American people. Fallow spectrum, in general, has little value. Developing the potential value of commercial spectrum is the task of private parties. So in many ways, the goal of the FCC is to create regulatory policies that foster effective investment to deliver services to the American people. If private parties don't invest - any high falutin' spectrum policy is meaningless -- because we rely on you to make it all happen.

Making it happen is exactly what our licensees have done in many spectrum bands -- the mobile phone industry is transforming Americans lives, increasing penetration rates, continuing their build out, driving

innovation. Our DBS satellite licensees have broken the monopoly hold of cable. The unlicensed service bands are creating a vast series of wireless local areas networks that are solving the "last hundred feet" problem. And that is only what is happening today -- there is so much on the horizon for tomorrow.

Unlicensed spectrum services are the first spectrum based service at the broadband party -- and our history of regulatory restraint in these bands provides a useful lesson in the benefits of allowing nascent services to develop. Unlicensed devices have rapidly become common place in the American home and office. They are relied upon for many everyday functions in consumers' lives- encompassing appliances from cordless phones, computers, baby monitors, garage door openers, and PDAs to wireless local area networks. In an example of this growth, in 1990 there were only 50 authorizations for unlicensed spread spectrum devices, compared to close to 350 authorizations in 2000. Recently, the Synergy Research Group reported that the Wireless LAN market posted its eighth consecutive quarter of double-digit growth and grew over 150 percent from 2000. It was estimated that 5 million Wireless LAN adapters were shipped in 2001. It has also been predicted that 21 million Americans will be using Wireless LANs by 2007. Today, millions of unlicensed devices are in operation, either independently or complimenting licensed services. Ironically this explosion of services and providers was largely unanticipated when unlicensed services were first authorized -–in fact, the flexibility afforded licensees was largely a function of the lack of interest

associated with the bands. Our challenge will be to exercise such restraint when everyone knows the stakes in a given band are high. Regardless of how we got here, unlicensed spectrum services dramatically illustrate the power of spectrum-based services and effective regulatory policy.

<u>The Contours of the Spectrum Policy Debate</u>

So spectrum policy is important—but before setting out our path, it's important to figure out where we are today. As an FCC Commissioner there is this temptation to think big -- we should move this over there -- grant these licenses this way -- and to act like we have tens of MHz of virgin spectrum. Needless to say, that is not the case. The Commission's spectrum management policies must be implemented in the context of numerous restraints -- some legal -- some factual.

The Commission is limited by the scope of its legal authority over spectrum. In addition to the shared responsibility with NTIA, the Commission's discretion is also statutorily constrained. My job is not to question these constraints but rather to work within them. In addition to the legal limitations, we are also limited by the fact that the spectrum is largely encumbered. There are exceptions -- the Commission recently initiated a rulemaking to develop rules for the 70, 80 and 90 GHz bands -- these bands are a rare new frontier for US spectrum policy. But most bands under our jurisdiction have significant incumbencies -- which means that any new spectrum policy must be

implemented with a recognition of the rights of incumbents.

Within these legal and factual limits, the FCC is charged with three main stages of spectrum decision-making. First the Commission promulgates an allocation -- for example, fixed or mobile, aeronautical or satellite, etc. Second the Commission develops service rules to guide the use of the spectrum within the confines of the allocation. Third, the Commission adopts a method for distributing the rights (defined by the allocation and service rules) to private parties. In performing these tasks, the FCC also must exercise its fundamental responsibility to limit harmful interference to spectrum users.

I would like to take a minute to examine each of the three roles played by the Commission. Unfortunately, I believe there has been a "squish problem" in the spectrum policy debate. Folks tend to squish all the respective roles and stages of spectrum policy together. This undermines policymakers' ability to focus on the tasks at hand. So in an effort to prevent the squish problem, I will assess each aspect of the policy process.

<u>A. Allocations</u> – Spectrum policy making at the FCC begins with an allocation. The radio spectrum is divided into blocks or bands of frequencies for categories of services. Allocation decisions, more than any other aspect of spectrum decision making, is closely linked to international decision-making. For example, it may do little good for the US to allocate a spectrum band for an international non-geostationary satellite service, unless

the rest of the world is prepared to do the same. Harmonized international allocations can also create the scale economies that are essential for the private sector to invest resources in, and in turn for Americans to be able to fully utilize, the spectrum resource. In this regard, the ITU process and the World Radio Conferences in particular play a significant role in spectrum management.

There was a time when allocations – like most spectrum management – was very detailed and narrow. Times have changed at the Commission – and I think increasingly the Commission is inclined to grant broad and flexible allocations where internationally permitted to do so. Gaining such international flexibility has been and continues to be our goal in international fora, such as the ITU. I believe this is clearly the right approach.

B. Service Rules: We have similarly evolved in our approach to service rules – there was a time when the Commission would decide that you would provide mobile wireless services to the forestry industry in this band and load at least x number of mobiles per base station within Y months. Thankfully that approach has now changed. Today the Commission uses its broad discretion in crafting service rules in the public interest to grant far more flexibility to our licensees.

A couple quick caveats on the trend towards flexible allocations and service rules:

First, the Commission remains committed to preventing harmful interference. If the Commission is going to

create an environment conducive to investment and deployment, we must recognize that service providers and investors need to understand the rules of the interference road. Knowing the rules of the road will also allow private parties to negotiate private interference protection arrangements where they advance the parties' interests. But government may itself eschew flexible allocations and service rules in order to prevent harmful interference through some spectrum "zoning" that attempts to group some types of allocations and services together to maximize overall utility.

Second, Congress has limited the Commission's authority to decide on a license distribution mechanism based on the type of allocation or service rules involved. So, for example, spectrum allocated and used for international satellite services, the Commission cannot distribute those rights via auction.

Bottom line, to the extent the Commission has discretion to act, the Commission will generally grant significant flexibility in the allocation and service rule stage of spectrum policy.

<u>C. Rights Distribution</u> – Over the years the FCC's spectrum rights distribution mechanism has evolved – from first-come first-served to comparative hearings, from lotteries to auctions. This has largely resulted from shifts in the Commission's statutory authority and mandate. As a result, there is no current uniformity in the distribution mechanism used across spectrum bands – even among like services. So today's broadcaster may

pay at auction, yesterday's did not. Cellular licensees did not pay, PCS did.

In response, I believe policymakers should make the "Legacy Concession" – that is, we cannot go back and make everyone equal – and it will tie us in knots if we try – instead we must maximize the public interest from where we sit today. Although I recognize what may appear to be the "unfairness" of this approach, I have been unable to develop any paradigm that would allow us to achieve retroactive uniformity. So I believe making the "legacy concession" is a condition precedent to a productive discussion of future spectrum policy.

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To summarize, there is widespread agreement that flexibility in allocations and service rules advances the public interest – and the Commission has substantial discretion in formulating the bundle of rights associated with that flexibility. In developing these rights, however, interference protection remains one of our paramount concerns. Once the allocation and service rules have been developed consistent with interference protections, the Commission then must determine how best to distribute that bundle of rights. This third decision point is where Congress has most limited the agency's discretion to act – and where some of the most heated spectrum battles are likely to be waged in the years ahead.

III. <u>The Key Battleground in the Spectrum Debate: How to Decide Who Gets Which Rights?</u>

A. To License or Not to License?

So what is FCC licensing?

It's a way of government distributing a good and sanctioning appropriate use.

What should be the Commission's goal?

To maximize the efficiency of commercial spectrum use by promptly getting as many rights as possible into the marketplace, while protecting licensed uses from harmful interference.

The economy is replete with two effective paradigms of rights distribution mechanisms (1) property rights or (2) a "commons".

First the property rights paradigm: land is distributed through market-based mechanisms and in a second step government sanctions the appropriate use of the land through zoning, building permits, and liability rules to guard against owners that may otherwise be able to externalize costs to adjacent land owners.

Second, government may distribute rights via the "commons" model by allowing some goods to be enjoyed by all people – so long as certain government-sanctioned norms are adhered to. So, for example, while land is largely distributed by a market-based mechanism – the use of the roads that connects the various private lands is sanctioned as a common. So long as folks obey certain

government imposed norms – don't speed, use a safe vehicle, have reasonable eyesight, have insurance – they are free to use the common.

The distribution of rights to spectrum can be analyzed as a continuum between these two paradigms – from a full property-like rights model to a pure commons model.

B. Law or Technology Triumphs?

The private property-like rights model is a lawyer's dream – distribution of all spectrum rights like any other piece of property. Ideally this occurs mostly in a secondary market with limited government involvement. Full implementation of this model is foreclosed by the statutory bar on ownership interests in spectrum licenses. The Communications Act's Section 301 states: "It is the purpose of this Act¼ to provide for the use of such channels, but not the ownership thereof." But the Commission has in recent years utilized the flexibility granted under the act to move towards a quasi-property rights model – for example through the auction process. Under the property-like approach, maximizing flexibility in service rules and allocations serves the public interest by allowing the "property" to be developed to the greatest degree. The "property" is then sold to the highest bidder in a very efficient auction process -- and the government role is complete. The market in spectrum becomes a series of secondary transactions with little government intervention.

In contrast, the pure commons approach is an

"engineer's dream." The unlicensed bands – as you know – do not provide for any real interference protection or for any exclusive licensee rights to spectrum. Instead, guided by some technical limitations, the bands are open to all comers so long as they operate approved equipment. This openness eliminates the entry barrier created by the auction price in the property-like rights model – but creates a different kind of barrier by imposing the more detailed technical rules of the common. In unlicensed bands, users rely on technology to overcome the risk of the traditional tragedy of the commons by innovating quickly enough to avoid any harmful interference. Traditionally property rights theorists have noted that "commons" – absent adequate safeguards – are inherently prone to suffer from the "tragedy of the commons." In other words, communal use will result in such reckless abuse by individual users (who have minimal individual interest in the health of the common) that the commons may become useless to the whole group. In the spectrum context, full implementation of a true common – that is, without any restrictions on use – would similarly render it virtually impossible for anyone to responsibly invest in equipment in the band. However, like commons operated by government today – such as parks and roads – spectrum commons can and have survived through allocations and service rules that inhibit individual's ability to spoil the common for the whole.

One observation on the commons model – lawyers cannot stand it because it's very messy! Things are unclear and sometimes rely on future technological

developments for survival. . . . that makes it unpredictable and an act of technological faith – not lawyers' favorite characteristics. Similarly the capital community can be nervous about the lack of property right associated with a core business input like spectrum. In all seriousness, I do believe its important to emphasize that one of the challenges faced by the agency is to fully accept the commons model as a consistent viable, yet distinct, alternative to licensed use.

IV. Where do we go from here?

In light of these two polar views of spectrum policy, what is a regulator to do?

The Commission is well served by utilizing both the property-like rights approach and the commons model. Just as a city has private land linked together by common roads and parks – so too may the spectrum community enjoy and fully utilize both private property and the commons. Indeed, if recent successful experiences with the unlicensed bands hold true, it may be that unlicensed operations are the roads that connect the private property of licensed spectrum holders into a continuous broadband spectrum web.

A. The Rules of the Common

The success of the unlicensed approach (just like its licensed sister) depends in large part on the Commission's willingness and ability to clearly define the rules that govern the common. This is important so that capital, and in turn, services, can flow to the

American people. The threat of the tragedy of the commons is real – and the Commission must recognize that risk -- and respond accordingly -- if it is to protect the vital contribution of unlicensed services.

But we also must be clear what the unlicensed bands are not. They do not create property-like rights – but rather focus on communal use. Some will be tempted to change the common into individual property – by squatting or other forms of adverse possession – and we must not give in to the temptation to transform these spectrum rights. Instead we must protect their inherent communal nature without restricting use to the point of creating quasi-property rights for individual uses or users.

The Commission does have considerable discretion in creating allocations and service rules and then distributing rights via the designation of a band as "unlicensed." Part 15 and the use of unlicensed devices began in 1938 and continued more or less along a consistent path through 1989. In 1989, the Commission added additional flexibility to the types of devices eligible for certification and opened the 2.4 GHz band to unlicensed development. In 1997, the UNII bands at 5 GHz were added to the mix. Today additional spectrum around 60 GHz and 76 GHz are available for unlicensed use – and additional bands in the 70 80 and 90 GHz bands are under consideration.

In supervising these bands or designating new ones, our rules should be as clear as practicable, strictly enforced, and maximize utility. Some commons may have more

stringent rules than others, but that justifiably allows for diverse uses. Folks don't drive their cars on the bike trails, or have picnics in the middle of a highway. But each use is valuable common use and society benefits from the picnicers and drivers – so long as they are in the appropriate spot with similarly situated neighbors.

I also believe there is significant benefit to internationally harmonizing unlicensed bands where practicable. Unlicensed bands too benefit from the scale and scope that international harmonization can provide. The FCC must lead the international effort to ensure American commercial interests are advanced through global harmonization of licensed and unlicensed bands.

Finally, we must resist the temptation to constantly change the rules and therefore undermine investment. The commons is a precarious place. Although the temptation at times will be great, constantly changing rules do not benefit anyone. We must endeavor to craft rules in the first instance that allow for technological advancement without a technological trainwreck. Our rules should be flexible and agile to provide the foundation on which to continue to build an industry.

<u>B. New Commons?</u>

Once we have established the types of rules necessary, the question remains when and where to implement spectrum commons.

Based on limitations in our statutory authority, today I believe government is unlikely to force the relocation of

existing licensees to permit unlicensed use. Most significantly, it is not clear that government would be prepared -- or is currently authorized to – pay the price tag for moving incumbents to create a common. There may come a day when – like a state building a new highway – government will pay auction revenue or tax dollars to relocate spectrum licensees to make way for common use. Going forward I think the FCC and the industry must think creatively as to what can be done on the regulatory side – and the industry and Congress must similarly think creatively on the statutory side to assess where and how new commons opportunities can be created.

In addition to relocation, the FCC could establish a commons through an overlay authorization. Under this regime, the Commission concludes that sharing between current users and unlicensed devices is possible and issues corresponding technical rules. As I will discuss more on Saturday, any sharing should be designed so as to allocate only those rights not granted to existing licensees. So, for example, when the Commission permitted UWB devices it concluded they would operate below the current noise floor and would not cause harmful interference. I am generally skeptical of these types of overlay unlicensed operations because of the difficult technical issues involved and the degree to which they may diminish the property-like rights associated with licensed services. Nonetheless it remains another way to develop additional unlicensed services.

Finally there are some finite opportunities to create

additional commons in virgin spectrum. The Commission must first make a call about the most valuable use for a given band. These are difficult decisions – and it is essential that the unlicensed community have their voices heard loudly and clearly in Washington when these initial allocation and service rule decisions are made. The challenges faced by the unlicensed community are somewhat unique: the decision to allocate to unlicensed use must almost absolutely be made as part of the initial allocation and service rules. Plus the unlicensed community by definition will not "own" the spectrum rights. Thus there is little incentive for any individual company to invest in advocacy for the creation of a common -- similar to the challenges faced by the environmental community to buy land as communal green space. So there is some imperative for the unlicensed community to organize and to identify potential virgin bands extremely early in the process and then press for designation for unlicensed use. I think it is fair to say that between the positive experiences with the rights-driven model and the revenue associated with spectrum auctions, the quest for additional unlicensed bands from virgin spectrum may prove difficult.

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In closing, I want to recognize that the power of the unlicensed bands – and the corresponding boom in consumer utility – is one of the great success stories of US telecommunications policy. I think we have learned important lessons from those experiences – lessons that I think will prove useful as we face the spectrum debates

on the horizon.

I appreciate the opportunity to be here this morning and I would welcome any questions or comments --