Spectrum Policy Recommendations:
Comments on the Federal Communications Commission
Spectrum Policy Task Force Report

Prepared Testimony of
Gregory L. Rosston
Stanford Institute for Economic Policy Research (SIEPR)

Before the United States Senate Commerce Committee
6 March 2003

Mr. Chairman and members of the Senate Commerce Committee, I am honored to appear before you today. My remarks are about the spectrum policy in the United States and in particular some issues that were addressed in the recently released Federal Communications Commission "Spectrum Policy Task Force Report."

Since 1987, I have been involved extensively in spectrum policy issues. I have written numerous academic articles on the subject of spectrum policy, including a 1997 FCC staff working paper with Jeff Steinberg entitled "Using Market-Based Spectrum Policy to Promote the Public Interest," that was subsequently published in the Federal Communications Law Journal.

My attached testimony is a draft of an article prepared to discuss the Spectrum Policy Task Force Report for the National Academy of Sciences Journal, *Issues in Science and Technology*. Although I have advised governments and private parties on spectrum issues, these remarks are my own views.

To summarize my conclusions:

- As much spectrum should be made available to the public as possible.
- Spectrum should be made available to the market with maximum flexibility. The Spectrum Policy Task Force Report sets a very modest goal of 100 MHz in 5 years; an FCC Office of Plans and Policy Working paper shows that it would be possible to give additional flexibility for more than 400 MHz in less than 2 years.
- The Commission should set initial interference rights for licensees and then allow negotiation.
- The Commission should set up rules to allow licensed owners to create "commons" where the market shows that commons are valuable.
- The Commission should rely heavily on the market to determine uses for this scarce resource just as we use the market to allocate most scarce resources.

The FCC Spectrum Policy Task Force Report: A Very Small Step

Gregory L. Rosston
Stanford Institute for Economic Policy Research
March 2003

Draft for submission to "Issues in Science and Technology"

Today it is relatively easy to get wireless high-speed access along with your high-octane latte at Starbucks, but not cheap. The combination will set you back more than $10 if you use the T-Mobile Wi-Fi network. In addition, licensed wireless services like Blackberry or advanced cellular (3G) service provide other ways of connecting to the Internet without wires. These modes of communication were not around 10 years ago. And in 10 years, modes of communication are likely to be substantially different than they are today. These new innovations create billions of dollars of benefits to consumers, but the realization of these benefits are dependent on the availability of spectrum which, in turn, is dependent decisions by the federal government.

The Commission should set forth guidelines to tie its hands to a marketplace solution. This will eliminate the current inefficiencies from lobbying for rules regarding each individual band of spectrum. The Commission also should to use market forces to determine how much spectrum should go to commons (or unlicensed) versus traditional licensed use. Finally, the Commission should ensure that new innovative and truly non-interfering uses can gain access to spectrum.

Demand for spectrum has been relentlessly increasing since Marconi's time. At the same time, technology has increased the ability to use spectrum. But advances in technology have not eliminated the fundamental scarcity of usable spectrum, and are unlikely to in the near future – demand for spectrum will exceed supply of spectrum if the price of spectrum is set at zero and there will be contention for the use of spectrum. Spectrum is "scarce," but so are lots of resources in the economy; the government's job should be to set forth policies to alleviate that scarcity as much as possible by getting flexible spectrum into the market, and to allow the market system to allocate the remaining scarce resource just as we do with most other scarce resources in the economy.

Because of contention, there is a need for an allocation system just like other scarce resources are allocated in our society. In addition, interference concerns have been one of the hallmarks of the justification for continued government involvement in spectrum policy. How the government addresses spectrum policy is critical to the success of wireless services and ultimately to the competitiveness of the communications sector overall.

The government should fully commit to an open, transparent and predictable spectrum policy that will maximize consumer welfare. Such a pro-consumer spectrum policy will allow consumers and companies to invest in radio equipment with an assurance about how they will be able to use the spectrum and what their protection from interference will be. To date, the government has failed to adopt a comprehensive pro-consumer spectrum policy because it continually "balances the interests" of different parties rather than attempting to maximize consumer benefits.

The FCC recently released a Spectrum Policy Task Force ("SPTF") report detailing some of the ideas that it hopes to pursue in the near term with respect to spectrum policy (http://www.fcc.gov/Daily_Releases/Daily_Business/2002/db1115/DOC-228542A1.pdf). This report is a very good primer on the background of the current issues in spectrum policy. The report reads like many of the studies that have come before it, including some FCC staff papers: it talks about the benefits of market allocation; it sets up ways to define interference; it stresses the need for more spectrum for licensed and unlicensed uses, and to allow for more "underlay" or non-interfering uses; and it talks about how to deal with scarcity and transaction costs.

However, in a backhanded compliment, Ebert and Roeper would probably review it as "The Feel Good Report of the Year." While the SPTF report provides a reasonable background on spectrum issues, it does not set forth any aggressive goals, does not change the nature of the debate about spectrum policy and ignores a lot of crucial issues. Tom Hazlett, in the 2001 *Harvard Journal of Law and Technology,* documents the long and tortured history of the FCC knowing the "right" thing to do with regard to spectrum policy, but not doing it. (I provide more recent examples in a forthcoming article in *Telecommunications Policy.*) Unfortunately, the SPTF report is set up to be another in the series of FCC actions that "talk the talk," but do not compel the Commission to "walk the walk" and really improve spectrum policy to alleviate the artificial portion of the spectrum scarcity that have been created by years of misguided regulation.

The Commission needs to get congressional support to be much more aggressive about spectrum policy than the Task Force report. Without congressional support, the Commission is unlikely to be able to implement a comprehensive pro-consumer reform of spectrum policy. But with it, the Commission could promulgate rules to get more spectrum into the hands of the public and improve the quality and competitiveness of all communications services.

Spectrum Policy Background

To vastly oversimplify, the main concern with spectrum policy is interference. If I use a band of spectrum for a transmission, my use may interfere with your communication and vice verse. If there were no problems with interference, virtually all spectrum policy would be unnecessary. Kevin Werbach, in a New America Foundation Working Paper, provides an "ocean" analogy where there are few rules necessary for ships at sea because the ocean is so vast relative to the room required for a ship so it is relatively easy to avoid

other ships. Unfortunately, in the world of spectrum today, there is "scarcity" and communications do interfere with each other. Instead of being the wide open ocean, the situation resembles a congested harbor. As a result, there is a wide body of spectrum policy. The ultimate goal of spectrum policy should be to make the ocean analogy apt or at least to reduce the scarcity rents accruing to spectrum, but it may also be important to set rules to allow for a congested harbor to function smoothly.

In an optimal world, spectrum policy would make tradeoffs, or even better set up frameworks so that marketplace participants could dynamically make the tradeoffs, between different uses of the spectrum. Today's spectrum policy is far from optimal: it evolved from the command and control days where specific frequencies were set aside for specific uses (including a specific channel for ice delivery!) and doled out as political favors – the original television license for Austin, Texas was awarded to Lady Bird Johnson.

There is a vast amount of spectrum – NTIA provides a spectrum chart at http://www.ntia.doc.gov/osmhome/allochrt.pdf for those who are interested in seeing the various allocations. Most of the spectrum that is used for mobile communications throughout the world is below 3 GHz. Fixed wireless communications can occur at much higher frequencies. Most of the spectrum has already been allocated, but there has been a push to re-assign spectrum from the government and television broadcasters.

There are still frequencies set aside for inefficient specific uses and it is difficult if not impossible to change the use of those frequencies. For example, the United States devotes more than 400 MHz of prime spectrum to over-the-air broadcast television while more than 80% of households get their television signals from cable or satellite. Two FCC staff members, Evan Kwerel and John Williams have put forth a novel proposal in a recent Office of Plans and Policy Working Paper to increase the amount of spectrum available to the public as well as to increase the flexibility for licensees. They identify more than 400 MHz of spectrum that could be made available to the market with flexible use within 2 years. The SPTF report sets a much more modest goal of 100 MHz within 5 years.

The ideas about what to do about licensed spectrum are pretty clear and straightforward – get the spectrum into the market with well-defined initial rights and responsibilities and then allow secondary trading and renegotiation of these rights. Economists, engineers and lawyers have written about these issues for decades. However, it has been much harder to get Congress and the Commission to implement these steps. It has been hard because there are strong entrenched interests that profit from the restrictions and would be harmed by a more market-oriented spectrum policy that reduced the artificial scarcity rents. For example, the FCC recently issued a decision to increase the rights of mobile satellite providers to use terrestrial repeaters to enhance service. Cellular and PCS ("Personal Communications Service") providers strenuously objected to the additional rights and may appeal the decision, but not on interference grounds.

While the drumbeat for spectrum reform on the licensed bands continues and small progress is made on that front (eg. the PCS licenses that were allocated in 1994 do not mandate technology or service except in relatively minor ways), there are two additional fronts that may dramatically change the nature of spectrum policy: unlicensed spectrum and ultra wideband technologies. There is a fundamental difference between the operation of these two policy or technology approaches. Unlicensed spectrum use requires a specific allocated band of spectrum like a national park. And that park has to be truly national (if not international) given the portable nature of wireless devices. Wi-Fi technologies use unlicensed spectrum; so do cordless telephones, garage door openers and a variety of other devices.

Ultra wideband (UWB) technologies do not require dedicated spectrum. Instead, they spread signals across wide swaths of spectrum, radiating only miniscule amounts of noise in any specific frequency so as not to interfere with other transmissions on the same frequency. This so-called "underlay" transmission operates under the "noise floor" so that other users do not notice the transmission and it causes no harm. It is as though a mosquito flew across your backyard – as long as it does not bite you or buzz your ear, you are unlikely to be bothered by it. As a result, UWB technologies can potentially operate within licensed and unlicensed bands without causing any harm to other users. The FCC recently set forth some rules for UWB technologies, so they are just beginning to take shape.

The common thread between unlicensed operations and ultra wideband operations is that they operate at relatively low power over relatively small geographic areas so that theoretically they do not cause contention with other users. One way they do this is through mandated or regulated etiquettes and protocols. Essentially, these rules are like those you try to teach your kids – "listen before you talk" and "don't take more than you need." The FCC sets etiquette rules for the band (in the unlicensed case) or technology (in the UWB case), so that the use of these potentially disruptive technologies is not free of regulatory involvement. In addition, for unlicensed bands, the FCC needs to determine the amount of spectrum set aside for unlicensed use.

So far, the FCC has allocated more than 400 MHz for unlicensed use and has just set forth the initial rules regarding the status of UWB technology. As might be expected neither of the issues is without controversy – the Defense Department, among others, is concerned about the interference potential of vast numbers of unlicensed and UWB devices that push the edges of the agreed upon protocols. And licensed users are concerned that UWB devices may cause interference to their licensed operations. Not explicitly stated, but underlying this as well, may be the concern that the new technologies could seriously devalue the licenses for which some companies paid billions of dollars, the same concern that prompted the objections to the expansion of mobile satellite spectrum rights discussed above.

Theoretically, unlicensed protocols will prevent interference, but there have been reports of areas where there is interference between different uses of the unlicensed band even though WiFi has been in use only a short time. In addition, protocols themselves can be

thought of as mechanisms to ration usage because demand exceeds supply at the zero price. This may be one reason why commons proponents argue for more spectrum for unlicensed use – one way to reduce contention is to increase supply of spectrum. But overuse of unlicensed spectrum (the "Tragedy of the Commons") is still a likely outcome when demand for a scarce resource priced at zero is greater than the supply. I should note that proponents of additional spectrum for zero priced commons use like Yochai Benkler of NYU argue that technology will ultimately lead to a lack of contention and increased capacity to avoid this pitfall.

Substitutes and Complements

Spectrum policy will have impacts on all forms of communications, whether they use spectrum or not. Much of the current debate at the FCC has been about local competition. Most of the projections of the cost of providing new wire (or fiber) based connections to homes are extremely high. High capacity wireless "connections" may be the answer to having multiple facilities-based competitors for residential customers. In this respect, regulators and antitrust enforcers should be cognizant of these potential competition effects when assessing mergers that involve wireless and wireline providers and ensure that there is sufficient incentive and ability to provide competitive services. The first step to ensuring competitive service provision is to get as much spectrum out into the market as possible and to make sure that the spectrum in the market is allowed to provide any type of service subject to interference constraints.

Economists often divide products into substitutes and complements – coffee and tea are used as examples of substitutes; if the price of coffee goes up, the demand for tea goes up. Coffee and cream are examples of complements. They are used together; if the price of coffee goes up, the demand for cream goes down.

With communications technology, this simple delineation is not so straightforward. Rapid technological advances, changing relative prices and the introduction of completely new products blur the lines. For example, early car phones were complements to the landline telephone network – calls from car to car were an extremely rare use of car phones. But now, many people are using wireless phones as a complement to their existing wireline telephone service as well as using it as a substitute for toll and long distance calling, and, in some cases, for local telephone service.

Wi-Fi and UWB technologies provide similar quandaries as to whether they will be complements to or substitutes for traditional wireline telephone service, wired high speed access services and licensed wireless services. Wi-Fi and UWB can be used within the home to enhance the value of wired services, or they can be used to connect multiple homes to a single wired connection, competing with wired services to each home.

There are also for-hire systems like Boingo and T-Mobile that have begun to deploy lots of access points and allow the public to use them for a fee. Within range of one of these

"hot-spots" one can log on to the system for a daily or monthly fee possibly including some fee for bandwidth used.

Spectrum policy has historically set aside specific frequencies for specific types of use. The Commission has frequently determined allowable uses for spectrum depending on whether the use was to be a complement or substitute for existing uses. Some spectrum is available only for backhaul for television signals when it might be much more highly valued in other services. The uncertain nature of the complementarity or substitution from the new services that will be provided wirelessly means that the Commission will have to be more agnostic with respect to the services that advocates propose to provide on spectrum made available to the market. Instead, the Commission should put spectrum on the market as rapidly as possible, and move rapidly to increase the flexibility of spectrum already on the market.

The Near-term Future of Wireless Communications

Licensed wireless service has experienced phenomenal growth since cellular service was first introduced about 20 years ago. At the time, McKinsey and Co. made the bold prediction that 1 million people would have cellular phones by the year 2000. They only missed by about 2 zeros. At more than $70 billion a year in service revenues, the wireless industry is quite large. There are a whole series of quotes from other technology visionaries that have missed the mark by at least as much for computers and other information technology. These missed projections show that it is important to implement policies that are flexible enough to adapt to changing technology and changing demand without starting the regulatory process over again. The SPTF Report is sufficiently vague in its specific recommendations that one could argue that it is well-suited to provide the flexibility necessary for change. However, because it leaves open the window for continued regulatory involvement, it is much more likely to hamstring efforts to adapt rapidly to changing market needs.

There will be differentiated competition between businesses based on different models of service provision to customers and the competition and ultimate consumer benefits from these depends on spectrum policy decisions made by the FCC.

Some licensed wireless carriers are implementing 3G (third generation) wireless systems. Advanced 3G services include high-speed Internet access, and video communications as well as other features that have not been thought of, but could be layered on the 3G architecture. Some carriers have adopted interim solutions such as so-called 2.5G systems that do not have the same capacity, but also do not have the same capital expense. To increase voice traffic capacity, carriers face a tradeoff between the introduction of new technology, purchasing additional spectrum or splitting cells so each cell covers a smaller geographic area. 3G technologies offer substantially more capacity as well as advanced services. To recoup the additional cost of the upgrades to the 3G technology, many of the carriers believed they would be able to offer and charge premiums for advanced data

services. To make this profitable, they may need a reasonable fraction of their subscribers to pay for these data services.

Consumer demand for on the move broadband access promised by 3G networks is unclear, but carriers are betting that at least some will materialize. However, with the rapid introduction of Wi-Fi services, consumers may be less willing to pay the premium prices for data access through the 3G networks. For example, demand for connection at the airport seems to be quite high – everyone has experienced the din of cell phone conversations as the plane taxis toward the gate and been nearly bowled over by people talking on the cellphone as they wheel their oversized carryon through the airport at breakneck speeds. The demand to check e-mail and websurf while waiting for planes may be high, but the 3G networks will be limited by the airports own Wi-Fi networks as a competitor. Granted the airport authorities have the opportunity to make Starbucks look like amateurs when it comes to overcharging for specific services, but they will have some competition from the 3G networks as well.

In the near term, there will be competition among the various forms of wireless communications – there is not a neat bucket of unlicensed use in the home and licensed use on the road. Both forms will compete for consumer use and spectrum policy should ensure that the mode that provides the greatest overall consumer benefits is allowed to flourish. The SPTF report is very vague about how it proposes to make the tradeoffs, but it seems clear that the implication of the report is that the answer is an administrative decision. Instead, the Commission should try to set up a market framework to adapt to the changing circumstances.

Implications of spectrum policy for wired networks

Local telephone companies have been losing retail lines the past couple of years. Wireless technologies have the potential to increase these line losses or to prevent price increases. In the late 1990s, local wireline growth was quite high with the demand for second lines to allow for connection to the Internet. Since then, the local telephone companies have been losing lines, both because of competition and because of new high speed access services from cable companies and DSL offerings that have obviated the need for a second line to have dedicated internet access.

Wireless provides additional threats to the local telephone companies. First, as discussed earlier, people are using wireless as a substitute for voice communications. On the data side, it may be possible for wireless to provide direct high-speed connections. Companies such as IP Wireless and SOMA networks are developing high-speed, high capacity wireless technologies using different licensed frequencies that can connect homes and small offices in competition with wired solutions.

In the longer term, there are other wireless solutions, using either licensed, unlicensed or UWB technologies, that can transport broadband signals further than the next door neighbor. Companies like SkyPilot and others have been trying to develop “mesh

network" solutions that allow many subscribers in a network to transmit across town to an access point, becoming transmitters, receivers and relays for the signals of the neighborhood.

Allowing competing networks to get access to the spectrum necessary to implement competitive alternatives to the landline network is likely to bring substantial consumer benefits. In addition to the increased competition, if these forays are successful, there is likely to be a lessened need for regulation of local communications services.

Implications for Spectrum Policy

Clearly spectrum policy has an impact on the nature of the market for communications services. In addition, the superabundance of possible uses and the concomitant competition implications will have an impact on spectrum policy.

There may be a legitimate role for trying to understand the future trajectory of technology and consumer demand in developing a spectrum policy. The SPTF report implicitly makes part of this argument by claiming that it is important to look at the nature of transmission and match up "good neighbors" to reduce interference. Given the already balkanized nature of the spectrum and the paucity of new places to shoehorn users in, this makes for a good sound bite, but is unlikely to have any real implications in the future of spectrum policy. Much more important for their argument is to ensure that spectrum neighbors abide by the interference rules that are set up and can negotiate new tolerances between them.

The future trajectory of technology and demand may be more important in the current spectrum policy debate regarding the dividing line between licensed and unlicensed bandwidth under an administrative allocation. It is fundamental that any allocation of spectrum to unlicensed use precludes the use of that same spectrum for licensed use. If future demand for licensed use would lead to higher social value, then that spectrum should be used for licensed use; if unlicensed use would provide greater benefits, then it should be allocated that way. However, the current method of spectrum allocation does not provide any mechanism for determining the relative values in the two different uses; instead, it relies on the ability of different interest groups to lobby the commission to allocate spectrum to their uses. The SPTF report states that "the exclusive use model should be applied primarily, but not exclusively in bands where scarcity is relatively high and transactions costs associated with market-based negotiations of access rights are relatively low" and the commons (or unlicensed) model should be used when the conditions are reversed. This provides the Commission plenty of room to do what it wants in each band on a case-by-case basis, subject to lobbying pressure rather than to have any real test of value.

An alternative to the use of lobbying to get additional spectrum set aside for different uses would be to stick to and increase the use of the auction mechanism. In fact, a commons model is consistent with private ownership, competition and auctions. There is

no reason why, if there is such a huge demand for unlicensed devices, a single operator or consortium of operators and equipment manufacturers could not bid in an auction for spectrum and then operate a "private commons." The licensee could sublicense equipment manufacturers and users to operate in the band and try to maximize the use of the band. This would lead to a marketplace solution to the determination of how much spectrum should be available for commons use.

Many of the proponents of the "commons" approach to spectrum policy decry private ownership of the spectrum because they feel that such private ownership will stifle innovation. The best way to ensure that private owners do not have such an incentive is to make sure that the market for spectrum is open and competitive – that there are sufficient numbers of owners of spectrum so that no owner has an incentive to block innovation because entrepreneurs with the next "killer ap" could easily go to another spectrum owner and get access to spectrum. The SPTF report does not address this answer to the innovation question.

There are real coordination effects that may be necessary to solve in order to get nationwide or even international access to spectrum. Two advances may mitigate this problem. The first is improvements in auction design. The FCC is moving toward allowing "package bidding" so that potential spectrum licensees can make all or nothing offers to get specific bands of spectrum across the country. This would facilitate the operation of a nationwide private commons. In addition, the auction advocated in the Kwerel and Williams FCC OPP Working Paper would get a large amount of spectrum on the market at the same time to help solve some of the coordination problems.

The second advance is the development and advancement of software defined radios. These radios are designed to be able to transmit over a wide range of spectrum and to modify dynamically their transmission modulation and other technical parameters to minimize interference with other transmissions. Software defined radios can be used in conjunction with UWB technologies, for higher-powered licensed use, or for unlicensed use, depending on the availability of spectrum at the time and location. With software defined radios, the need for a commons to be on the same frequency across the country is not as great.

Advances in technology are a boon to the use of wireless devices. The amount of information that can be transmitted on the same amount of spectrum is much greater because of advances in digital signal processing, microprocessors, etc. And future advances will increase substantially the carrying capacity. At the same time, demand for spectrum-based services will increase also, partially due to advances in capabilities and services offered and partially due to price decreases from cost reductions.

However, the advances are unlikely to eliminate scarcity and interference concerns in the use of the spectrum. While it would be wonderful to have the spectrum be as bountiful as the ocean, the fact is that there is likely to be contention for the use of the spectrum in many areas. The increasing demands for extended area Wi-Fi use is likely to increase the

amount of contention in Wi-Fi spectrum. Proponents argue that users will have the incentive to adopt efficient technologies that minimize the problem.

However, in a similar, open-entry, non-propertized band for land mobile radio (the so-called "private radio" bands that are typically used for intracompany radio communications like taxicabs), users are stuck with old, technically inefficient equipment. Why? Because none of them has the incentive to adopt new equipment on their own that would free up spectrum for use by others. Instead, they came to the FCC with a proposal to transition over 27 years to equipment that was not quite state of the art at the time of their proposal.

In the unlicensed bands, upgrades to reduce spectrum scarcity and contention are likely to require the same type of coordination that was required to begin to clear up the congestion in the private radio bands. There is no clear reason why this congestion and difficulty in coordination for upgrades will be absent in a shared unlicensed environment too. A private operator of an unlicensed commons would have incentives to require its tenants to upgrade equipment to provide better or higher capacity service.

Many of the large licensed PCS and cellular providers have been migrating their networks to 3G (third generation) technologies that promise higher network capacity and much higher bandwidth to the consumer. This is the second transition for cellular carriers without any real government involvement or prodding – they transitioned millions of subscribers from analog to digital handsets because they had the incentive to conserve on spectrum use.

Most of this has focused on unlicensed operations. There are also some concerns about UWB. For small numbers of users in a geographic area, it is almost assuredly possible to stay under the noise floor. However, when there are thousands or millions of users in an area, even if each is operating at low power, there is a real possibility that the amalgamation of their signals will cause interference above a noise floor for a licensed user. For both UWB and unlicensed broadcasters, it may also not be possible for the transmitter to know if it is causing interference.

The UWB/underlay concept is very important for the introduction of new wireless uses. To the extent that a user can transmit without technically hurting the transmission of a licensed user, that is a true social benefit. (It may cause economic harm to the licensed user because of increased competition, but that should be considered a benefit). Spectrum policy should encourage the additional use of spectrum. However, when setting up the rules for non-interfering use, the Commission needs to have a system in place so that users understand the rights and responsibilities of ensuring against interference to licensed users. The tradeoffs are to set up a system where new users have to ask first and go through a process to prove they will not interfere in advance of beginning service, or where they can begin and then be shut down if they do cause interference. The SPTF report is silent on this important issue.

Conclusion

The SPTF report lays out the major issues for policy makers: interference and allocation. But it does not set forth a very aggressive agenda, nor does it tackle many of the key issues that face Congress and the Commission. The recommended policy should be to get spectrum into the marketplace as quickly and flexibly as possible and set forth a way to deal with interference disputes in the marketplace. That would increase substantially the effective supply of spectrum in the marketplace and create the appropriate incentives for spectrum conservation.

In areas where there truly is no contention, the Commission should allow entry so that consumers can benefit from the additional suppliers of communications services. Entry and the provision of new services has created billions of dollars of value to consumers and the Congress and the Commission should focus on ways to facilitate this happening in the future. The best way is to ensure that companies with innovative ideas can gain access to spectrum without having to go to the Commission and reveal their business plans and then wait for five years while the Commission works on a way to release the spectrum is to get more spectrum into the market.

That spectrum should be released to the market in a way that will allow the market to determine the highest value use – exclusive use or commons. The best way to do this is to start with de facto property rights with broad flexibility and then to let owners of spectrum determine what consumers will demand.

Hopefully, the SPTF report will cause some positive movement in spectrum policy, but it took a very small and tentative first step, and not completely in the right direction.