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AUCTION LICENSES RENEWAL TERMS: BUILD- OUT REQUIREMENTS

What Happens After The First Term?

Table of Contents

- Introduction..... 1
- Radio Spectrum Licenses: Property Rights Distribution History 2
- Radio Spectrum Licenses: Current Terms 3
- Secondary License Term Build Out..... 5
 - Revenue versus Infrastructure..... 5
 - Precedent for Fees..... 7
 - Legislation..... 9
 - Fee Structure 9
 - Benefits of the Proposed Fee 12
 - Revenue..... 12
 - Innovation 13
 - Other Concerns 14
- Conclusion 15

Introduction

The rapid growth of technology has made it imperative to address how the limited radio spectrum is licensed and allocated. Radio spectrum is a finite and valuable natural resource. The U.S. government and commercial telecommunication activities have grown at an exponential rate as technology continues to develop. Leadership has begun to address the need for more commercial radio spectrum. In 2010, President Obama requested 500MHz of federally allocated spectrum be reallocated for commercial use. Radio spectrum is critical to the expansion of the U.S. economy and for the U.S. to stay competitive in the global market.

Radio spectrum is a natural resource owned by the public and the public should derive benefit from its use. The U.S. government manages the resource with the public's interest at the forefront. As a result, the U.S. government have used the value of spectrum to raise funds for government activities by auctioning radio spectrum licenses. However, there are deficiencies in the system including a) the lack of means to collect revenue from these licenses after auction and b) license holders are not required to build out service and infrastructure after the first license term. This paper argues that including these considerations within the radio spectrum auction system will ensure the public continues to benefit from commercial use of this valuable resource.

This paper is organized as follows: First, a brief history of radio spectrum license distribution will be presented to provide a foundation for the discussion of potential renewal license terms. Second, the current license terms will be detailed. Third, the paper will explore the structure of possible renewal term build outs. Finally, the paper will conclude with recommendations on a path for implementing the suggested changes.

Radio Spectrum Licenses: Property Rights Distribution History

The U.S. Federal government has allotted spectrum use through various mechanisms: comparative hearings, lottery, and ultimately settling on auctioning to raise the most revenue. Radio Spectrum assignments are controlled by the U.S. Federal government because it is a finite natural resource owned by the public, and the Federal Communications Commission (FCC) regulates the distribution of radio spectrum assignments. Initially the FCC assigned radio spectrum licenses through comparative hearings, a flawed process where commercial companies vying for spectrum band assignments would present a convincing case to win, sometimes over promising services and infrastructure builds out¹. Later, in 1981, the FCC developed a lottery system to award spectrum license rights². The executive branch and legislative branch recognized the potential to generate revenue by auctioning licenses of radio spectrum bands. Therefore, Congress authorized radio spectrum auctions in 1993 as a part of the Omnibus Budget Reconciliation Act by adding §309(j) to the Communications Act of 1934³.

Auction of radio spectrum licenses was a concept discussed by academics for many years as the radio spectrum was increasingly utilized in telecommunications⁴. The United States began the first auction of radio spectrum licenses in 1994⁵. In the early 90's these auctions were a key

¹ Blake, J. (1994). FCC Licensing: From Comparative Hearings to Auctions. *Federal Communications Law Journal*, 47(2), 179-184. Retrieved from:

<http://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=1046&context=fclj>

² U.S. Federal Communications Commission. (1997, Sept 30). Report and Order: The FCC Report to Congress on Spectrum Auctions (WT Docket No. 97-150). Washington, DC: U.S. Government Printing Office. Retrieved from: <http://wireless.fcc.gov/auctions/data/papersAndStudies/fc970353.pdf>

³ Buck, S. (2002). Replacing Spectrum Auctions with a Spectrum Commons. *Stanford Technology Law Review*, (2).

⁴ Coase, R.H. (1959). The Federal Communications Commission. *Journal of Economics* (2), 1-40. Retrieved from: <http://www.eecs.berkeley.edu/~dtse/coase.pdf>

⁵ Federal Communications Commission. (2006). About Auctions. Retrieved from: http://wireless.fcc.gov/auctions/default.htm?job=about_auctions

component in balancing the U.S. Federal budget and they continue to draw competitive bids for commercial interests to obtain key spectrum bands.

Auctions have the potential to raise significant revenue for the U.S. Federal government. However, as some analysts point out, including the President's Council of Advisors on Science and Technology (PCAST), radio spectrum license auction revenue is not as lucrative as it appears when spread out over the ten year term of the license⁶. With this in mind, Congress sought new ways bring radio spectrum licenses to auction. Specifically, Congress identified voluntary incentive auctions as a vehicle to accomplish revenue generation goals. Incentive auctions enable companies to voluntarily relinquish radio spectrum band licenses in exchange for a portion of auction proceeds. Since incentive auctions have the promise of raising revenue, Congress enacted new legislation in 2012 allowing incentive auctions of broadcast TV spectrum bands through the Middle Class Tax Relief and Job Creation Act⁷.

Currently, the only revenue collected for spectrum licenses is through auctions. There are no other mechanisms in place to collect revenue after the initial auction payment. The next section of this paper will review the current terms and conditions of auction licenses in more detail.

Radio Spectrum Licenses: Current Terms

The high demand for radio spectrum, coupled with it being a finite resource, requires spectrum allocation to be optimized. As a result, first term build-out requirements have been established to ensure the allocated spectrum is largely utilized. Radio spectrum licenses awarded

⁶ U.S. Executive Office of the President President's Council of Advisors on Science and Technology. (July 2012). Enforcement Coordinator Annual Report On Intellectual Property Enforcement Cover Title Here Report To The President Realizing The Full Potential Of Government-Held Spectrum To Spur Economic Growth. Washington, DC: U.S. Government Printing Office.

⁷ Federal Communications Commission. (2015). Incentive Auctions. Retrieved from: <https://www.fcc.gov/incentiveauctions>

through the auction process or administrative processes require certain terms and conditions be met and self-reported.

Build out requirements vary depending on the allocation and service rules of each spectrum band license. Variations include the type of requirement, number of benchmarks, and length of build out periods⁸. The most recent large auction of radio spectrum, AWS-3, released the report and order requiring more extensive build-outs. It mandates that by year six of the first license term, the license holder must show they are serving 40 percent of the population which the license is intended to serve. Additionally, by year 12, the license holder must demonstrate they are serving seventy-five percent of the population which the license is intended to serve⁹.

The AWS-3 report and order set forth new license durations in reaction to the request of the industry. Commercial license bidders asked for these longer license terms to increase incentives to build the infrastructure they requested the license term last for 15 years⁹. In the past license terms ranged from 8 to 10 years. The FCC compromised; now, under the AWS-3 report and order, the first license term lasts for a period of 12 years. Each subsequent renewal is for a period of 10 years.

A primary deficiency of the current policy is the lack of build-out requirements for the subsequent renewal years. License holders are not required to pay additional fees for use of the radio spectrum, build additional infrastructure, or provide extended services.

⁸ U.S. United States Government Accountability Office. (2014, February). Spectrum Management FCC's Use and Enforcement of Buildout Requirements (GAO-14-236). Washington, DC: U.S. Government Printing Office. Retrieved from: <http://www.gao.gov/assets/670/661153.pdf>

⁹ U.S. Federal Communications Commission. (2014, March 31). Report and Order: Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695- 1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands. (GN Docket No. 13-185). Washington, DC: U.S. Government Printing Office. Retrieved from: https://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0401/FCC-14-31A1.pdf.

Secondary License Term Build Out

The radio spectrum is a natural resource owned by the public and needs to benefit the public. As such, auction fees indirectly support government activities to effectively manage the use of radio spectrum. However, revenue generated through auctions is irregular and insufficient. In fact, in July 2012 PCAST released a report that determined the government will not continue to receive reliable revenue through radio spectrum band auctions because long term net future revenues from auctions for clearing U.S. Federal spectrum bands are not anticipated. Therefore, license renewal build-outs are necessary with the primary goal raising revenue. The PCAST report further suggested a fee in perpetuity should be charged with the potential of raising a few billion dollars of revenue each year⁶. President Obama has proposed spectrum license fees (beyond the initial auction) in budget proposals, none of which have been enacted by Congress due to strong lobbying and opposition from the telecommunications industry¹⁰.

The remainder of this paper will discuss the optimal policy for the build-out requirement of renewal license terms and details why the proposed policy is most beneficial.

Revenue versus Infrastructure

The renewal license terms can be structured in two different ways, either a fee can be imposed to collect revenue or the terms and conditions can require service and infrastructure build outs designed to service a larger portion of the population. These two options will be explored next.

¹⁰ Hattem, J. (2014) White House brings back user fees for spectrum. *The Hill*. Retrieved from: <http://thehill.com/policy/technology/199823-white-house-brings-back-user-fees-for-spectrum>

Revenue should be the first mechanism added to build out terms for renewal licenses. Revenue has the most immediate benefit to the public as it can support spectrum management and other government activities that need funding. The AWS-3 spectrum auction raised net revenue of \$41.3 billion, which appears to be a large sum. When this is amortized over the life of the first license term it is approximately \$3.4 billion per year. However, as licenses continue to be renewed the benefit significantly decreases because no further fees or royalties are required, as indicated by the PCAST report. For example, if a license obtained through the AWS-3 is renewed for a second term and amortized over 22 years, the license effectively raises only \$1.8 billion per year. If a renewal term is built out requiring license holders to pay a usage fee, the public would see continued long term revenue (and therefore benefits) from continued spectrum use.

Other mechanisms can be used instead of a usage fee in license renewal build outs. One example of other options is the expansion of the first term build out requirements, requiring license holders to service a larger percent of the population. For instance, the build out requirement in the second license term could raise the population served requirement from 75 percent at the end of twelve years, to service 85 percent of the population after the first 5 years of the second license term, and so on. Another example of alternative renewal term build out requirements could mandate the servicing of verticals such as healthcare, education, and energy by requiring spectrum license holders to ensure these markets have sufficient telecommunication service to advance their goals. Specifically, in the healthcare industry there is a growing reliance on mobile monitoring and wireless devices. While there is spectrum allocated for medical use (the 2360 to 2400 MHz band),¹¹ the renewal build-out requirements could require a portion of the spectrum band be slotted

¹¹ Kasun, R. (2013). Healthcare Going Mobile. *Regulatory & Quality Solutions, LLC*. Retrieved from: <http://raqasolutions.com/2012/09/healthcare-going-mobile/>

for medical wireless devices to have priority to accommodate the healthcare industry's growing need for radio spectrum.

The recommendation of a renewal license term build out requirement is to benefit the public in subsequent radio spectrum license renewals. There are risks to making specific service and infrastructure requirements because the rapid changes in technology, telecommunications, and the global market can result in service and infrastructure mandates to be quickly outdated and less relevant. In order to change the service and infrastructure requirements for renewal license terms the FCC would have to initiate a slow bureaucratic regulatory process. Revenue is more dynamic and can be appropriated as needed. Therefore, a revenue generating fee is the best the mechanism to add to renewal build out terms.

Precedent for Fees

Next this paper will review the existing precedent for commercial radio spectrum usage fees in other countries, as well as precedent within the U.S. for similar fees imputed in industries that access natural resources.

The case for usage fees in renewal build-out terms is strengthened by the precedent for radio spectrum usage fees in other countries. India and Korea have successfully implemented a hybrid system that consists of lump sum fee paid for the license and continued royalty payments based on revenue. This financial model has been determined by academics to be mutually beneficial for the licensees and licensors because they share the risk of spectrum. As a result, the countries have seen investment in infrastructure encouraged in the private sector, greater

competition, and increased spectrum supply encouraged within the government¹². India and Korea are two of many countries that collect usage fees for spectrum use. The success makes a compelling argument for the U.S. to also adopt a usage fee in second term build-outs.

Additionally, there is precedent within the U.S. to charge continuous usage fees for the rights to extract natural resources on leased federal lands. The telecommunication industry has similar needs to the oil, gas, and coal industry to access finite natural resources. There is natural comparison, these industries have parallels in how access to the sought out natural resources is obtained, namely that licenses are granted through an auction process with set time limits:

1. Oil and gas companies¹³ and coal miners¹⁴ obtain leases to access and perform extraction activities on land through a competitive bidding process similar to the auction of radio spectrum licenses.
2. The leases for access to coal mining lands are twenty years. Leases for oil and gas use are ten years, which is more similar to the length of radio spectrum licenses.

Leases in the oil, gas, and coal industries vary from telecommunication radio spectrum licenses in the requirement to make royalty payments. In addition to the leases, these industries pay royalty fees on the revenue produced from the activity on the land. The standard royalty rate for both industries applies a 12.5% fee on the fair market value of extracted resource.

¹² Kwon, Y., Lee, J., & Oh, Y. (2010) Economic and policy implications of spectrum license fee payment methods. *Telecommunications Policy*, 34(3), 175–184. doi:10.1016/j.telpol.2009.09.002 Retrieved from:

<http://www.sciencedirect.com/science/article/pii/S0308596109000998>

¹³ U.S. Department of the Interior Bureau of Land Management. (2012). Questions and Answers about Leasing. Retrieved from: http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/questions_and_answers.html

¹⁴ U.S. Department of the Interior Bureau of Land Management. (2012). Coal. http://www.blm.gov/wo/st/en/prog/energy/coal_and_non-energy.html

This paper does not suggest the first term of radio spectrum licenses should include additional fees. The first term includes build-out requirements mandate companies strengthen infrastructure to maximize the spectrum potential and population served. This investment provides a benefit to the public similar to the public benefit derived from royalties paid by the oil, gas, and coal industries. However, after the first term, the public should continue to derive a benefit from the continued access provided to commercial radio spectrum licensees, similar to how natural resource extraction companies continue to pay royalties for continued use.

Legislation

Fees paid in perpetuity must be statutorily mandated. This legislation should be enacted under Title III of the Communications Act, Special Provisions Relating to Radio¹⁵. The authority to impose build-out requirements are granted in this Title and the usage fee is akin to the build out requirements of radio spectrum licenses.

Congress should authorize the FCC have regulatory authority to adjust the usage fee percent upwards. However, the FCC should not be allowed to give fee discounts or exceptions outside of the statute. While the oil, gas, and coal industries do receive royalty relief as the land is depleted¹³, spectrum is renewable and as such should not have fee relief.

Fee Structure

Continuous usage fees are optimal, opposed to one lump sum payment for renewal license terms. This benefits both the public and commercial license holders in that usage fees will ensure the U.S. Federal government has a continuous, reliable revenue stream and commercial license

¹⁵ 47 U.S.C. § 307 Retrieved from: <https://www.law.cornell.edu/uscode/text/47/chapter-5/subchapter-III>

holders will not have the burden of paying large lump sum payments¹⁶. Usage fees are in line with the recommendations of both academics and policy makers who have been discussing the most appropriate structure of radio spectrum fees in subsequent license renewal periods. To ease administrative burdens this paper recommends fees are paid quarterly and trued-up at year-end after the financial statements are filed and revenue is determined.

The purpose of the usage fee is for the public to have immediate benefit in the continued licensing of the radio spectrum, therefore the approach should be simple and straightforward. Revenue is the most straightforward mechanism. The usage fee proposed will be a small percent of the total revenue reported and charged to all commercial spectrum license holders.

Other various fee structures have been explored by academics all of which are overly complex and unreliable, including: auction price, net income, and bandwidth. The auction price method is a pricing mechanism that is a derivative of the original auction price paid and further adjusted to present value¹⁶. This method has the risk of being unfair if the auction price paid was later determined to be too high or too low. If the auction price method is implemented litigation will follow to determine the true fair market value of the license. Therefore, this method should not be employed. Another fee calculation option is to compute the fee based on a percentage of net income or taxable income. If companies do not have net income no benefit will be derived; as a result, these approaches are also not recommended. Other complex computations have been

¹⁶ Kwon, Y., & Kim, B.K. (2012). Royalties vs. Upfront Lump-Sum Fees in Data Communication Environments. *Telecommunications Policy*, 36(2), 127-139. doi: 10.1016/j.telpol.2011.11.017. Retrieved from: <http://www.sciencedirect.com/science/article/pii/S0308596111002102>

suggested to calculate the royalty fees including to charge a fee proportional to bandwidth of a company's transmission facilities which could result in stifled innovation incentives¹⁷.

A portion of the proposed fee should be earmarked in the US treasury for a FCC enforcement fund. There is a natural relationship: the enforcement bureau is responsible for ensuring the public's interest is maintained and the proposed usage fee has been suggested to ensure the public continues to benefit from spectrum allocation. The enforcement bureau is underfunded and facing cut backs. It is ill-equipped to hold all license holders accountable¹⁸. Radio spectrum license holders should be held accountable for both harmful interference and meeting build out requirements. Currently the standard of accountability is self-reporting. However, the standard is insufficient and overly optimistic. The U.S. Government Accountability Office independently discovered 25 percent of license holders surveyed misrepresented their build-out progress⁸. The enforcement bureau needs to be better funded to support enforcement of the build out requirement mechanisms designed to serve the public are actually being met.

The final structural requirement is the fee not be passed on to the consumer. The purpose of the fee is for the continued benefit to the public in lieu of infrastructure build out requirements in second license terms.

¹⁷Weinberg, J. (1999). The Internet and "Telecommunications Services," Universal Service Mechanisms, Access Charges, And Other Flotsam of the Regulatory System. *Yale Journal on Regulation*, 16(2), 211-244. Retrieved from: <http://0-search.proquest.com/libraries.colorado.edu/docview/235744647>

¹⁸ Anderson, J. (2014, November 24). FCC Enforcement: On the Wane? [Web Log Comment]. Retrieved from: <http://diymedia.net/fcc-enforcement-on-the-wane/7374>

Benefits of the Proposed Fee

The benefits of adding a usage fee to the renewal license term build-out requirements are rich, including increased revenue and innovation. These benefits are discussed in the following two sections.

Revenue

As discussed throughout this paper, the public should benefit for the continued use of radio spectrum. Revenue is an immediate way to realize benefit quickly. The revenue will be collected by the U.S. Treasury and distributed to the enforcement fund as detailed above, the FCC, and other government activities.

Opponents to the proposed fee may argue there is little revenue gained because U.S. Federal taxes will be less as a result. This argument is not entirely accurate because taxes are paid based on net taxable income, and this fee will be on revenue. While the taxes paid will be lower and the change in net cash flow to the U.S. Treasury will not equal the total fee collected, that does not mean there will not be a significant net gain. A simplified example is as follows: assume the usage fee is 10 percent, revenue was \$100, and the effective tax rate is 40 percent. The tax would change post usage fee from \$40 to \$36, however the government would have collected a total of \$46 (\$10 usage fee plus the \$36 tax fee), which is an increase of \$6. When translated to actual revenue this gain can be substantial and a large benefit to funding U.S. government activities. Another counter argument is the usage fee will raise expenses and ultimately reduce the total tax owed and tax paying entities will not suffer from double taxation, which is a benefit for the commercial entities.

Innovation

Imposing a fee on continued spectrum use will naturally encourage license holders to review their utilization of the radio spectrum they have the right to use. Scarcity drives innovation and creativity. Companies will want to either maximize all the potential of their spectrum and/or reduce the amount of spectrum licenses they hold.

Not only have auctions generated revenue to support government activities, but auction revenue has been earmarked for investment in the advancement of telecommunication innovation. The Middle Class Tax Relief and Job Creation Act of 2012 budgeted \$100 million from spectrum auction proceeds go to the Wireless Innovation Fund overseen by the National Institute of Standards and Technology¹⁹. The U.S. government makes great efforts to support the development of telecommunications. The usage fee is another way to support the best management of the spectrum, not hinder innovation that improves it.

Opponents will counter-argue the required fees paid to the government will reduce the amount of capital they can spend on innovation.

A suggested work-around is to couple the fee with deregulation of strict spectrum use. The radio spectrum licenses come with strict use requirements to limit interference and other issues. By enabling license holders to have more freedom with their licensed spectrum bands, so long as interference is not an issue, the industry would have more freedom to be innovative with their technologies. Regulation stifles innovation more directly when firms are burdened with obtaining

¹⁹ U.S. Office of Management and Budget (Ed.). (2015). Fiscal Year 2015 Appendix, Budget of the United States Government. U.S. Executive Office of the President. Retrieved from: https://books.google.com/books?id=W-46zkfLG24C&pg=PA223&lpg=PA223&dq=how+spectrum+auctions+have+helped+fund+government+activities&source=bl&ots=YfIn5xv2ud&sig=YffI2PBWA0rKI_JGi3AE2PnQNq4&hl=en&sa=X&ei=4ApiVfPZAYy0ogTuooGYBA&ved=0CFUQ6AEwCO#v=onepage&q=how%20spectrum%20auctions%20have%20helped%20fund%20government%20activities&f=false

permission before entering new markets and offering new services²⁰. The deregulation of the usage requirements will encourage innovation and advancement in the industry.

Increased fees will benefit the public and deregulation will satisfy industry needs to be innovative and invest in research and development in radio spectrum technologies.

Other Concerns

Opposition will also argue a fee structure in effect makes the FCC both a regulator and a creditor. The FCC will be at increasing threat of regulatory capture, the theory that the regulator become beholden to the industry. Opponents will contend the conflict of interest has the potential to skew dispute settlement decisions. Specifically, the FCC may settle in favor of a larger and more established incumbents due to reliability of fee collection versus a riskier small business. The result of this arrangement would make it more difficult for smaller companies to compete with large commercial parties.

Opponents may argue the FCC should not engage in a risky settlement to act as a creditor, given previous instances of companies defaulting on their fees. In previous auction arrangements, the FCC allowed auction winners to pay the auction fees through installment payment plans. After the C Block auction in the late 1990s, three of the small businesses who took advantage of installment payment agreements defaulted and entered bankruptcy. This resulted in not only significant lost revenue but the FCC could not take the licenses back for re-auction. After this failure installment payment plans were deemed too risky and are no longer a payment option²¹.

²⁰ Ellig, J. (2006). Costs and Consequences of Federal Telecommunications Regulations. *Federal Communications Law Journal*, (58)1, 37-102. Retrieved from:

<http://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=1422&context=fclj>

²¹ Fritts, B. C. (1999). Private Property, Economic Efficiency, and Spectrum Policy in the Wake of the C Block Auction. *Federal Communications Law Journal*, (51)3, 849-885. Retrieved from:

<http://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=1211&context=fclj>

The conflict of interest concern is inflated. The proposed fee is not a large lump sum payment for the rights to the radio spectrum license. It is simply a usage fee to further benefit the public, similar to the successful Universal Service Fee (USF). The USF has not created conflicts of interest or been risky in terms of bankruptcy proceedings. There is always a risk of default when collecting fees, however just because there is a risk does not provide a valid argument to not impose one in the first place.

Conclusion

Second term build out requirements are necessary for the public's continued benefit from commercial radio use. Revenue is the most efficient and immediately realized mechanism to ensure benefits are realized. It is important to employ a simple structure and have mutual benefits for both the public and the industry. The benefits of adding revenue address the most pertinent needs: increased revenue for the U.S. Federal government and increasing innovation in the radio spectrum. Working together to build a better infrastructure, service, and utilization through renewal usage fees will help meet the goals to have robust use of the radio spectrum to promote a flourishing and competitive economy.