



Extended Abstract

Dallas Smythe and the Spectrum Commons

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Introduction

The explosive growth in the wireless communication industry in the last two decades rests upon one all-encompassing truth for wireless providers: without access to spectrum, you cease to exist. Wireless broadband service cannot be provided without making use of the invisible, finite, publicly owned frequencies that serve as the conduit for mobile devices.

For many regulators and industry officials, it has become an accepted maxim that industrial societies are nearing a spectrum capacity crunch. Industry has argued for years that the explosive growth of mobile data, triggered by the adoption of smart phones and tablets and the popularity of streaming video, has meant that they must have exclusive access rights to increasingly large portions of the public airwaves in order to provide adequate service. Since the 1990s this allocation of spectrum has largely been done via auction.

Dallas Smythe wrote that the radio spectrum “does not rest with particular individuals or nations, but with all humanity” (D. Smythe, 1987). Smythe was the first vocal opposition to the concept of spectrum auctioning when it first appeared as a theory in the 1950s (Dallas W. Smythe, 1952; Dallas Walker Smythe, 1957; Taylor, 2013). He remained steadfast in his opposition to auctions as a method of spectrum allocation, even as they gained wider acceptance. Reflecting on that 1952 paper decades later, Smythe described it as “an article that I could not have improved 35 years on” (D.W. Smythe & Guback, 1994).

The wireless industry has been unequivocal that it cannot provide service unless larger areas of the public spectrum are opened to them. The entire drive to auction spectrum is predicated on the idea that spectrum is increasingly limited. However, despite its fundamental importance to our increasingly mobile world, this scarcity is rarely quantified. There is increasingly reason to question this theory. This paper presents the results of a unique project measuring spectrum usage in Canada's urban core. In doing so, I explore the legitimacy of questions of spectrum scarcity using a test case in Canada's most populous city. I also explore spectrum policy approaches beyond the auction of private licenses as ways of strengthening public wireless access.

This paper explores the effects of 20 years of spectrum auctioning and places Smythe's theory in the context of the current environment. Using Smythe as the theoretical foundation, I ask if auctions are serving the public interest.

Methods

The first section of the paper draws upon the theory introduced by Smythe in the late 1950s that auctions were a poor allocation method for the public spectrum. Smythe's position was later supported by fellow Canadian communication scholar William Melody (Melody, 1980). This paper also draws upon work of Eli Noam (Noam, 1997), Yochai Benkler (Benkler, 2012) and the conclusions of a report prepared for the President of the United States in 2012 (President's Council of Advisors on Science and Technology, 2012) to argue for a more commonist approach to spectrum access.

The second part of the paper offers unique quantitative data addressing the issue of spectrum capacity in Canada. Working with Ryerson University's Department of Electrical and Computer Engineering, I collected data on licensed mobile broadband frequencies using a spectrum analyzer. Data was collected hourly for each licensed band in twelve-hour shifts over three days. The spectrum analyzer registered activity for a band in the top chart and density of usage in the bottom chart.

Results and Discussion

The data clearly demonstrates the inefficiencies of paired spectrum allocation – a common approach in the allocation of this resource. The research discovered large discrepancies between the transmission frequencies and reception frequencies. In short: the data demonstrates that the allocation of this public resource is poorly structured, allowing for large amounts of prime public spectrum to sit unused by incumbents.

Conclusions

Questions of spectrum management should not be the exclusive realm of engineers. Scarcity is a fundamental element of classical political economy. In the *Wealth of Nations*, Smith writes that scarcity is the underpinning of almost all economic exchanges, from labour, rent, to agriculture and precious metals. The spectrum scarcity argument has been allowed to exist largely unchallenged for the last two decades.

This paper questions the scarcity argument and uses the theoretical foundation offered by Dallas Smythe to probe into greater questions of spectrum and the common good.

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References and Notes

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