

Spectrum as Farmland?

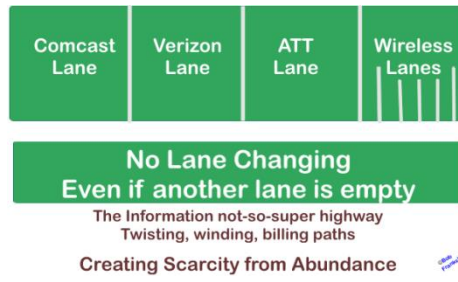
These comments were written a response to the brief exchange with Tom Hazlett on Dewayne Hendricks' mailing list included below.

You may want to read the simpler essay on the [Information Not-So-Super Highway](#).

Also the talk

<http://rmf.vc/Talk>

[ThinkingOutside](#) where I do more to explain why the Internet allows us to escape the paradigm of channels that is behind the idea of allocating bands of "spectrum".



Looking at the idea of spectrum auctions is a good starting point for challenging the defining assumptions of today's concept of telecom. The problem is not in the idea of an auction but in what we auction – as in the "40 acres and a mule" model of spectrum allocation. We should be asking for bids on contracts to maintain common facilities rather than auctioning off our ability to communicate to service providers. More like roads than railroads.

Even if we accept the idea that spectrum allocation makes technical sense (not that it does) the power of the auction comes from normalizing the market into fungible dollars rather than having each sliver be limited to a single purpose.

Why not normalize the wireless space into bits or what I'm calling the Bit Commons. With bits we go beyond the spectrum because we no longer need to distinguish between wired and wireless bits. This means that we don't have to reserve exclusive paths between two points but can take advantage of any available path and simply hop onto the nearest fiber or copper path or whatever.

I agree that auctions are just a mechanism but before we assume that an auction is (or isn't) the answer we must understand the question. I may be unfair in saying that economists are all-too-ready to accept an arbitrary statement of the problem and go from there. But the fascination with spectrum allocation is an example of where the givens are accepted. To be fair to Tom – he has observed that the spectrum allocation gets perverse with OTA (Over The Air) broadcast rights merely being tokens to get access to cable paths.

But the very idea of "performance criteria" presumes we have locked down the market to backward-looking metrics – the givens. We've now had enough experience with the Spectrum as Farmland?/[Bob Frankston](#)

Internet and the power of decoupling of applications from best-efforts transport to have a better approach in a market that decouples the physical facilities from the applications. Aligning incentives is more effective than locking people into an arbitrary measure. Look at the damage done in 1934 by over-defining the solution based on the givens of the day. I argue that decoupling works because it leverages market forces and not just because it is an imposed solution that requires constant intervention.

There are also many ways to increase effective capacity by giving application designers direct access to bits so they are no longer choosing among services but instead availing themselves of opportunities to create new solutions rather than being stuck with same-old solutions to same-old problems. (This is a deep topic in its own right).

I know the word "commons" is often completed with "tragedy" but this isn't about cows consuming grass – we're merely communicating or talking. And thanks to the large numbers of bits acting like flows and our statistical portion of the allocation is huge even if we are competing for the capacity. Furthermore this is a market in which supply grows with demand – the more pie you eat the more pie there is!

How can an auction work if we have super-abundant capacity? As noted in "[Assuring Scarcity](#)" the wireless industry would rather spend billions of dollars on auctions than risk the threat of abundance.

High stakes auctions have serious problems in creating all-or-nothing high-risk bets and leaving "breakage" (unused portions of allocations). With bits we no longer have exclusive allocations but instead a shared commons. One can argue that we can avoid breakage in the auctioned bands by subleasing portions of "broad bands of spectrum". Bits facilitate this but in doing so they make nonsense of the idea that the first allocation need go exclusively to a first bidder. You can think of a spectrum auction as merely moving the old idea of application-specific allocations one step off -- why stop there?

There is nothing entirely novel here. We've had the example of private pikes becoming public roadways.

The current system has many disadvantages and creates laws that treat community owned infrastructure as unfair competition to companies who use their exclusive control of our rights-of-way to force us to buy their services. The financing models for these private paths means that the costs are amortized over a long period of time and we find ourselves forced to subscribe to use our local facilities.

If you go to cablecos and say that they no longer need to pay franchise fees but can instead use the public infrastructure or bit commons you will find that they get upset. Their very business model is premised on violating anti-trust principles by using their control of the physical infrastructure to their advantage. Why does the FCC aid and abet such policies?

The “company store” model has a direct and devastating effect on the economy and public safety by leaving us unable to take advantage of the essentially zero marginal cost of using our infrastructure. Instead we are stuck with an E911 system that costs lives because it is brittle and for emergencies only. It’s like having a medical system without the concept of preventative medicine or even ongoing care. We also create a price barrier to our very ability to communicate and to create new businesses. You have to negotiate with all those along the path. It’s like driving across country paying a toll each town (often in the form of congestion) with each burb maximizing its local revenue at the expense of all others.

I can understand people having a trouble with some of what I’ve said. One problem is that without technical understanding it seems necessary for networking to be a service. With the bit commons we’d have people facilitating transport of bits. Finding a path from one end point to another is more like driving using the common physical infrastructure than like being forced to buy a ride. When I say facilitating – I mean that operators are rewarded for providing capacity but not paid for the transport of content because that would *and does* reward scarcity.

The Original Exchange

-----Original Message-----

From: dewayne-net [mailto:dewayne-net@warpspeed.com] On Behalf Of Dewayne Hendricks

Sent: Sunday, May 10, 2009 10:18

To: Dewayne-Net Technology List

Subject: [Dewayne-Net] Re: Shovel-ready broadband stimulus

[Note: This comment comes from friend Tom Hazlett. DLH]

From: Thomas Hazlett twhazlett@gmail.com

Date: May 8, 2009 8:43:11 AM PDT

To: Dewayne Hendricks dewayne@warpspeed.com

Subject: Re: [Dewayne-Net] Re: Shovel-ready broadband stimulus

Hi Dewayne-

Thanks for posting my FT.com piece.

A quick response to Bob, if you'd care to distribute:

In fact, economists are well aware of the fact that not all problems are best suited to resolution by auction. Ronald Coase wrote a famous 1937 paper which launched a general inquiry as to why some activities are undertaken more efficiently within the firm than via use of "the price system" -- i.e., auctions.

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We are so used to presuming a fixed pie that we have not noticed that the telecom industry has violated Moore’s law openly and wantonly – we simply don’t expect abundance. Why have we not had another fiber bubble collapse? The gun it not only smoking but it keeps shooting. If we learn the lessons of the amazingly growing capacity of the cellular phone system we would notice that you can increase wireless capacity arbitrarily by hopping on the nearest wired path instead competing for “spectrum” over a large footprint. This is what you’d get if you’d make all the existing access points transit points and then improve the technology. <http://www.bnettv.com/player.php?id=2536> is interesting in seeing how the cellular industry manages to create scarcity by entangling itself in the Regulatorium and thus finding refuge from the threat of abundance.

So let’s take lesson of the auction to heart but instead of normalizing to dollars, normalize to bits and then the whole thing becomes moot.

More detail:

- [Information Vs. Telecom](#). A deep dive into why bits decouple the transport from the meaning with some more comments on spectrum.
- [ATT’s Plight](#). The problem with trying to make money by owning “Spectrum”.
- [Assuring Scarcity](#)
- [Single Frequency, Single Hop Signaling](#)

Many others have investigated how property rights are efficiently awarded and, in many cases, show competitive bidding to not be the superior system. My research ("[The Rationality of U.S. Regulation of the Broadcast Spectrum](#)," J Law & Econ [April 1990]) specifically criticizes Coase's paper on the FCC where he argued that auctions should have been used in the 1920s to distribute radio broadcasting rights. That ignored the more efficient path that had actually been adopted (and was then pre-empted in the 1927 Radio Act), priority-in-use rights.

But auctions are highly socially advantageous across a large class of cases. The reason why reverse auctions make eminent sense in spending so-called broadband stimulus monies is that they force performance criteria to be explicitly established and then generate information as to the most economical path. The former imposes transparency, reducing political gamesmanship; the latter saves taxpayer funds.

What's not to like?

Thomas Hazlett

[Note: This comment comes from friend Bob Frankston. DLH]

From: "Bob Frankston" Bob19-0501@bobf.frankston.com
Date: May 7, 2009 9:08:55 AM PDT
To: dave@farber.net
Cc: "'Dewayne Hendricks'" dewayne@warpspeed.com
Subject: RE: [IP] Shovel-ready broadband stimulus

Why am I not surprised that economists claim that they can solve any problem by holding an auction according to rules they define? And bureaucrats say they can act as soon as they get measurements (even if they are meaningless)? And same-old business just see another revenue source. We've seen this show before and we're in reruns.

I'd like to shift the focus to liberating the value in the infrastructure rather than leaving it locked into the same-old value chain" we call telecom services.

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