

# Thinking outside the pipe

These comments are based on the ideas in a [talk](#) I gave at [The Internet Society](#) meeting in New York on [the Internet as Infrastructure](#). Note that I'm focusing on the Internet itself apart from the "social layer". What is important is maximizing the opportunity without prejudging what we do with it.



Update: You may also want to look at the [talk](#) I gave to ISOC in DC in March 2012 and sharpened some of the points.

A picky eater can be undernourished amidst abundance. The Internet has given us a taste of the abundance all around us. Yet we've unnecessarily restricted the benefits that we and our economy can enjoy from that abundance because of the artificial limitations of the telecommunication industry's limited palette of services.

Connecting a mobile pacemaker to a physician's office is simple using Internet protocols but it becomes difficult when the telecommunications providers control the path and need to assure that they make a profit from each message. It's similar to the problem of asking a railroad to serve a small town that doesn't buy many tickets. Fortunately we have an alternative – roads serve the communities without having to be profitable because they benefit the community.

Cities provide roads everywhere because they don't need every inch of pavement to be a profit center. When New York City's private transit companies failed, the city took them over instead of letting them fail.

The wires that run along our streets cost very little by comparison to roads, so why are we investing so much effort to **prevent** us from communicating unless we pay a provider?

There is a historical precedent for this. Until the 1920's the United States had private turnpikes but unlike the railroads the communities that owned them understood that their real value as vital infrastructure. The roads existed to benefit the community rather than benefiting an owner.

Initially the roads were built by the local businesses to encourage commerce but by the 1920's the prevalence of cars made the value of paved roads obvious to all. Today toll roads are the exception. We don't charge for the use of

Main St. even though streets are expensive to build and maintain.

Our telecommunications policies have created scarcity out of abundance. We see clearly when we look out a window in a tall building and see an entire city. Our wireless (spectrum) policy is akin to licensing colors so you can have only one red building in the entire city.

And our broadband policy is not much better because it's akin to privatizing roads and forcing us to stay within our provider's lanes even on an empty highway.

Why must our information highways (to use an old cliché) be restricted to narrow paths? The answer lies in history going back to way 19<sup>th</sup> century telegraphy business.

We think in terms of railroads with our messages being treated as freight to be carried to a distant destination just like they did when the telegraph wires ran along the railroad tracks. And because bits are invisible, we can imagine they act like trains of packets running on phone wires.

We need to free ourselves from the past and recognize that the Internet is based on a very different concept.



To understand this we can look at the packets, or containers, we use to ship goods across the oceans. They can be loaded on boats without the ship owner knowing what is inside. The containers can take any path across the ocean – they aren't restricted to channels and you can even use airplanes.

If you are shipping an entire factory you split up the components and place them in containers. When they get to the destination you reassemble them in order and if some get lost you ship replacements.

One might not be so casual about delays and replacements for expensive gear; but with Internet packets that all happens within a thousandth of a second.

One advantage of container shipping is that you don't pay the shipper extra to carry a factory – you just pay the cost of transport. You don't pay the carrier a portion of the value of the goods themselves.

Freed from the limitations of pipes and the need to buy services from carriers the market can work its magic. By

owning our infrastructure (as a community) we can choose how to serve our own needs and priorities.

Instead of having pipe providers, communities would hire people and companies to help facilitate the movement of packets. Unlike providers who need to restrict capacity so they can collect rent on wires, we can embrace the abundance by funding our common infrastructure. Wires and radios are synergistic rather than competing technologies.

Unlike today's telecom industry which requires a vast governmental regulatory system, an infrastructure approach gives us a true marketplace for companies seeking to provide gear and maintain the flow of bits. To understand this in more detail read about [the Internet as Infrastructure](#).

Once you think "outside the pipe" you're ready to embrace the boundless opportunities all around us – the opportunities that drive our economy.