

# Internet Connectivity: Toward a Sustainable Funding Model

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I'm writing this in the midst of policy discussions between the Internet world (as embodied in ISOC) and the Telecommunications industry (ITU).

The Internet and Telecommunications are very different concepts. The Internet allows us to focus on the task at hand. That's why it is so exciting. Historically telecommunication assumed value was created inside the network and this creates conflict with creating value outside the network.

The various concerns expressed about dealing with huge flows of data, "high speed Internet" and governing of usage are reminiscent of the days of mainframe computing when the emphasis was on performance and services. Big data flows are essential to the telecom story which associates value (and revenue) with quantity. Providers continue to benefit from the assumption that they must manage or govern the flows.

Personal computers represented a completely different approach to computing which enabled discovery and innovation. People (as individuals or in corporations) who owned their computers, drove rapid innovation in hardware and software.

The Internet itself, as an entity, is not the hardware – it is how we use the available resources. The routers, wires and radios are just means. For that matter we treat the entire telecommunications industry as just another means of exchanging bits. With TCP we managed to extend our local connectivity over long distances despite, telecommunications policies. To move ahead we need to understand how the Internet emerges from how we cooperate. Imposing a governance model works at cross-purposes with this process.

Before we discuss the details of policies we need to think about how to best serve the needs of society. Do we continue with telecommunications policies which require that we negotiate with a provider before we can communicate? Or would we be better served if we work towards an Internet created by its users?

At the heart of the matter is the core assumption made by many that telecommunications, a vital infrastructure, must be profitable to a provider. Putting this in terms of community infrastructure, it's as if we couldn't have sidewalks unless an external third party made a profit from every step

we took. That, to most, would seem a strange, improbable proposition.

This has been tolerated because many see the Internet through the lens of the applications it carries. In that manner it does appear to deliver on promises. Since promises have value, the business model can be seen to make sense. But the Internet is actually a very different concept – it's about creating opportunity. This value is created outside of the network.

If we are to understand the Internet we have to recognize that it is fundamentally an economic model in which value is created by the users and not by providers. The value of a phone call depends on what you say and not on how many bits it takes to say it. Assuming an owner must make a profit is fundamentally incompatible with providing opportunity for others to create value.

Rather than looking back we need to reframe the discussion in terms of what we've learned from the Internet and through a century of digital innovation.

We can work together as a community to create a common infrastructure that benefits our community. Rather than relying on a third party for services, we hire companies to manage facilities. Historically we've incorporated cities and formed communities just like we create corporations in order to accomplish tasks that require coordination and cooperation.

Telecommunications is modeled on the dated idea of carrying messages (telegrams) like FedEx carries packages at a profit. The Internet is much more like the streets – we no longer rely on a provider to take responsibility to assure that our messages are carried like precious cargo. It would make no sense to fence off our common streets and sidewalks so an owner can make a profit by selling access.

Value is now created outside the networking facilities. Just as a writer creates value using words, we create value using bits. With "best efforts" we don't depend on an operator to assure that the message gets through – we're only exchanging bits. A network owner can't know which bits are vital (such as a medical call for help) or those just being used to share a joke.

This means that the Internet is more like roads (and sidewalks) than railroads – we take responsibility for our trips

rather than entrusting our travel entirely to a (rail)road operator or networking operator.

If we had tried to fund roads like we do railroads by charging for rides then people who did their own driving would be seen as competition to the road owners' business of selling rides. This is the situation we see today with today's providers depending on selling services such as voice telephony and cable content. It is hard to make money selling a commodity that isn't even consumed and without the ability to differentiate the offerings. Telecommunications companies may try to follow the lead of airlines in managing capacity but do we really want policies which require scarcity? This is disincentive to expand, as the economic necessity of scarcity impedes growth.

This is a situation fraught with conflict and it cannot end well. Small wonder that under the telecom providers system we need a vast regulatory apparatus. Let's not let this be the case with the Internet.

Just as communities own their own roads, they can own their own connectivity as stakeholders and have every incentive to add the capacity. Communities would pay once for the gear and hire people (or companies) to do the installation and maintenance.

By taking this approach:

- We finesse neutrality since we're dealing with just bits and not content. Imposing neutrality is too much like trying to enforce "[separate but equal](#)".
- We finesse "Internet Freedom" issues because there is no necessary gatekeeper in the path preventing unbilled and unauthenticated bits from passing.
- We avoid imposing artificial accounting models that assume value correlates with the number of bits (as if a movie is a billion times more valuable than a medical monitor).
- We encourage the use of existing facilities by avoiding the need to confine bits to billable paths.
- We shift control from government regulators to markets, as communities choose their own suppliers of gear and support.
- Anyone can contribute capacity

Connectivity from the edge is a very pragmatic approach. We can start locally as in a single apartment house, or a multi user dwelling or other such community to assure local connectivity while pooling efforts to achieve economy of scale in purchasing further connectivity at wholesale from a traditional provider. This is a powerful dynamic

that can grow as these communities grow to the scale of cities and beyond.

One reason it is difficult to accept the idea of local ownership is the assumption that someone must be in charge of the entire network in order to make sure everything works just right. The Internet is a dramatic demonstration that this is not true. Skype can do better than the PSTN because it is not limited to what can be guaranteed. With failure as an option we can see rapid innovation. Geoff Huston's [presentation](#) on QoS (AKA promises) provides some more perspective on this issue.

Some of the opposition to community ownership comes from those who worry about government control. Yet many of our problems with "broadband" come from government's effort to sustain the telecommunications regulatory regimen. By shifting to an infrastructure model we are taking the government out of the role of managing providers. Instead, community boards and local governments are simply means of coordinating our efforts. We do, however, need to be careful and avoid governments using subscriptions or other legacy funding models.

These individual efforts composite into a whole just as the national road system emerges out of our local and regional road systems. In my recent ISOC [talk](#) I went into more detail about how connectivity begins at the edge. A simpler explanation is in <http://rmf.vc/NotSuper>.

The Internet has given us a generative, market-based, way to use common resources to provide connectivity. The existing telecommunications infrastructure is one such resource but it is no longer a necessary resource. In working organizations such as the ITU we need to look ahead rather than focusing on policies mired the past.