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Technology

The incredible shrinking US broadband plan

The government is losing its ability to do big things

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Last March, the Federal Communications Commission in Washington, with some fanfare, [presented its National Broadband Plan \(http://next.ft.com/content/6e28e672-308b-11df-a24b-00144feabdco\)](http://next.ft.com/content/6e28e672-308b-11df-a24b-00144feabdco). A year later and well over two years into the new administration, it is worth looking at the progress in promoting an infrastructure that candidate Obama had declared essential.

In 2010, homes with fiber passing (or close nearby) increased by about 9.5m, and cable's superfast DOCSIS 3.0 became available to 25m additional households. But little of that was due to the plan or stimulus money. Actually, in the preceding year those upgrades had been higher, 9.8m for telecom and 30m for cable. They are expected to decline further as the upgrade and deployment programs are nearing completion.

The plan's bottom-line goal – 100m households with an internet connectivity of 100 megabits per

second by 2020 – was hardly ambitious. Given the rate at which private cable and telecom companies were pushing ahead, the goal would be achieved anyway without government support (though not as equally distributed as envisioned by the national plan.) Other countries are much more forward-looking. Korea, which already today has an almost universal service at the level of 100 Mbps, announced a target of 1 gigabit per second to every household. Japan aims to reach a 100% fiber penetration this year, up from 50% in 2009. Australia is creating a national fiber to the neighbourhood for 93% of the population at 100 Mbps, with last-mile upgrades for gigabit connectivity to follow with demand.

Advocates of the US National Broadband Plan (NBP) responded by pooh-poohing the importance of bitrates (“speed”) and stressing instead progress in the applications and penetrations of broadband connectivity. But this was hardly persuasive. If speed is indeed unimportant, what then is the point of the whole exercise of moving the country beyond narrowband? Applications and performance are intertwined in chicken-and-egg dynamics. Isn't the leading edge of an electronic infrastructure essential for economic progress, just as concern for the trailing edge is important for social development?

And now, even the moderate goal of the national plan has been substantially lowered, by no less than President Obama. In recent speeches he has cherry-picked the wireless part from the approaches of the NBP. The broadband priorities of

the Administration are now focused on the emerging new generation of wireless mobile and fixed phones and devices, also known as 4G.

The idea is to liberate 500 megahertz of spectrum, to auction it off to providers of 4G, presumably mobile telecom companies, thus more than doubling their spectrum, and to use the proceeds to create broadband connectivity for unserved areas and people. Let's look at the elements of this program.

Where would the new spectrum come from? About half from several governmental users, though whether this will actually materialise is a good question, because each of these uses has its fierce advocates. Most of the rest would come from existing broadcasters, who would voluntarily give up all or some of their over-the-air spectrum in return for an unspecified slice of the auction revenues. These auctions would raise about 28bn dollars.

But will this happen? Unless financially imperilled, most broadcasters have no intention to voluntarily surrender what they have come to consider their spectrum patrimony, or be pushed to yet another band, especially if the result is to facilitate the entry of competing video platforms and viewing options. Congress, with its strong Republican presence, will not easily approve such displacement unless their rural constituents benefit substantially to make up for loss of part of their free TV. And even many Democrats will notice the large regional re-distribution required by any plan that aims at a

roughly equal coverage of the country. The attached map, from the US government's own national broadband map, shows how high and regionally unequal such redistribution would be. In the Western half of the country, unserved households would require, in most counties, more than \$25,000 on average to reach the national targets. Given the inevitable legislative and legal roadblocks, the process of shifting spectrum from TV broadcasting to telecom will take much time and political capital.

In the end, it is likely that much less spectrum will be available for auctioning than envisioned, and hence less money would be generated.

Furthermore, in any calculation of net proceeds one needs to subtract the pay-offs to broadcasters for their spectrum, the cost of clearing other spectrum bands for their relocation, the tax deductibility and amortization of the spectrum licenses by their new holders, as well as the requirement to support poor TV viewers when they are forced to move their TV sets to another band, and to cable and satellite subscription TV.

Of these highly speculative auction revenues, only a small part would actually go to broadband infrastructure – \$5bn for rural 4G. Virtually nothing would go towards fiber upgrade, or to cable based infrastructure, or to an upgraded traditional copper based DSL. But \$9.6bn would go to cut the federal deficit (i.e., we would sell off assets to fund current consumption), and \$10.7bn towards a public safety network, of which about one third would be to pay off the public safety users to vacate

their spectrum for 4G use.

In other words, a major struggle with broadcasters in the name of broadband internet will result in \$19.6bn for non-broadband purposes, and in only \$8.2bn towards infrastructure, all of it for 4G wireless.

Moving more spectrum to mobile and fixed wireless users is a laudable goal and deserving support. But it is hardly a national broadband push. It's basically a mobile enhancement. It would barely raise coverage. The current 3G generation of mobile already reaches at least 95% of the population without the benefit of a national plan, and President Obama has called in his State of the Union Address for a 98% coverage of 4G, which is not much of a difference. The main contribution would be to improve the coverage for every smartphone user in the country to higher data speeds. But even then it would reach realistically speeds of only about 3 Mbps once a lot of people are using data-intensive applications, which is only a fraction of the speed of wire line speeds. Fiber supports today 150 Mbps, and can easily be upgraded to gigabit speeds as demand emerges. Cable's DOCSIS 3.0 runs at over 50 Mbps, and can readily reach 200. Even DSL, using slightly improved telephone networks, can reach in newer versions over 20 Mbps.

Also, mobile 4G broadband service would be more expensive than such wire line services, both in absolute terms (about twice the price), and even more so per unit of data. Satellite-based broadband

internet, even its next generation, is even more expensive. Since it's hard to imagine that rural people would do their taxes or type their resumes on a smart phone, they would still require a computer or tablet device for meaningful uses, so there are no savings on the equipment end.

From a taxpayer's perspective, such coverage would also be more expensive than DSL for large parts of the country, as can be seen from the FCC map. For the western and northeastern parts of the country, closing the broadband gap by means of DSL would be cheaper than with 4G.

(The FCC map probably ignores the potential of fixed 4G in rural areas, which could provide higher speeds at a lower cost than DSL, and are often operated by independent companies, so-called WISPs. They often use license-free bands in low density areas where spectrum is more plentiful, thus not requiring the costly relocations of existing users.)

Lastly, the inherent limitations of wireless communications mean that their use would be more restricted and managed by the network operator to keep data flowing. In other words, the openness of the internet, protected through rules of net neutrality, would be harder to sustain in the more limited wireless 4G environment.

Would rural areas accept for long the 4G mobile communications as their broadband platform—at a lower speed, higher price, and with less openness? Not really. Thus, 4G is only a temporary substitute.

Why then not move the national effort to fibre, which by general agreement, is the road to the future? The problem is that the Federal budget deficit does not permit the funding of a national fiber initiative. This leaves the government with the fallback to use an off-budget currency – spectrum allocations— to advance its goals, and it shapes its preference to the wireless platform.

But if fiber upgrades are to be pursued, too, how would those investments then be generated?

The approach here needs to generate creatively off-budget strategies. It would have four elements:

1. *Tax incentives*, through investment credits for incremental high-speed network upgrades in low-density areas, and for certain hardware upgrades by low-income end-users.
2. *Regulatory incentives*, such as encouragement for cable, telecoms, and other infrastructure providers to share the fiber in low-density areas and thus lower their cost, subject to openness requirements and consumer protections.
3. *Creation of a Federal off-tax funding mechanism*. This already exists through the universal service fund for rural telecom and is being transformed into a wider mechanism for broadband. It is, in effect, an internal taxing mechanism for telecom and soon for broadband, paid through a levy on communications bills. However, the amounts raised today for high-cost areas is about \$4.5bn, of which maybe a third would go to fiber, and are not enough to fund fiber

nationally. Expanding this mechanism would be the most realistic source of funding, and it might find the approval even of anti-tax Republicans because it is pro-rural and not formally a tax.

4. *Local cost sharing.* There should be a much stronger role and responsibility for states and municipalities to support the infrastructure in their states following their own priorities. They could work with private companies, and use tax-free municipal bonds to support these projects. This should be promoted by Federal matching contributions, using the broadband fund mentioned above.

To conclude: the vision of a nation-wide fiber infrastructure should not be replaced by merely facilitating the new generation of mobile communications, and then relabeling it high-speed broadband. If the US is losing its technology lead it is not because of a lack of private sector initiatives, but because its government is losing the ability to do or enable big things.

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