

Don't Neglect 'Invisible Infrastructure'

By Julius Genachowski

In his early days in office, true to his campaign promises, President Donald Trump is promoting a \$1 trillion plan to upgrade the nation's aging physical infrastructure. To maximize job creation, investment and benefits to all Americans, he should also focus on our "invisible infrastructure"—the unseen airwaves that enable wireless connections.

Mobile communication has been a powerful platform for innovation and economic growth. The mobile apps economy now contributes \$36 billion annually to U.S. gross domestic product and has created some 750,000 new jobs.

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essentially digitize the physical world, will create more than \$4 trillion in economic benefits by 2025. Wi-Fi allows entrepreneurs to start businesses in coffee shops; mobile helps companies operate more efficiently, expand their businesses and hire new employees; and wireless connectivity will help improve and expand access to health care and education.

But that's only if we pay attention to invisible infrastructure. The foundation of the mobile economy is electromagnetic spectrum—the radio frequencies used to transmit bits of information to and from mobile devices. As data-hungry, internet-connected gadgets have proliferated, demand for spectrum has risen dramatically: Wireless data transmission has increased 35-fold since 2009. With more than 200 billion devices expected to come online by 2020, demand for bandwidth will only grow.¹

Meeting this demand requires overcoming two challenges. One, spectrum is finite. And, two, a significant amount

of spectrum is still allocated for the uses of the past, not the needs of the future.

These challenges don't solve themselves. And as a former FCC chairman, I learned that progress demands focus, leadership, and a willingness to work with the best and brightest—inside and outside government—to develop new ideas and guide them into law and policy. Ajit Pai, the new FCC chairman, has the experience and capability to develop new policies to unleash spectrum; the challenge will be to resist distraction and make it a high priority.

As a start, here are some ideas the new administration should pursue as part of an Invisible Infrastructure Initiative.

First, expand the spectrum pipeline. In 2010, President Obama set a goal (at the time thought unrealistic) of freeing up 500 megahertz of spectrum for broadband by 2020, backing a recommendation from the FCC. Thanks to initiatives including the commission's pioneering incentive auction, which reallocates high-quality licensed spectrum from television broadcasters to wireless companies, we'll soon be more than halfway there. The new FCC should accelerate efforts to free more spectrum until that goal is met, and the president, Congress and the commission should set a bold target for 2030 that includes high-band spectrum for ultrafast 5G services.

Next, focus on government spectrum. The federal government has far more than it needs: According to industry and FCC studies,² it still has sole or primary use of almost 70 percent of spectrum best suited for broadband technologies. Of course, the government needs spectrum for military and civilian uses, but the allocations are decades old and inefficient—with twice as much reserved for certain satellite uses as is needed, for example. Allocating more government spectrum for commercial use should be a priority. Sharing more of it—for instance, letting the military open some of its allocation for civilian purposes—could help advance the federal mission with reduced costs and better technology.

Opening up more unlicensed spectrum should also be high on the agenda. Unlike licensed spectrum, which is

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auctioned for exclusive commercial use, unlicensed spectrum is available without cost to anyone, so long as basic rules are followed to prevent interference. It has served as a forum for permissionless market innovation, enabling the development of powerful technologies such as Wi-Fi and Bluetooth. Yet as FCC chairman, I was surprised to see opposition among Republicans to freeing up new unlicensed spectrum. Unlicensed versus licensed spectrum is a false choice. We need both.

Finally, the new administration should focus on removing barriers to expanding broadband. Meeting the needs of the Internet of Things and 5G will require denser networks with more antennas. Yet local authorities frequently delay approval, often in an effort to extract unfair payments. In 2009, the FCC adopted a 90-day “shot clock” to speed these decisions. The new president and Congress should expand the FCC’s ability to preempt unreasonable state and local restrictions. They should also expand “dig once”

policies, which mandate that federal road construction projects include conduits for broadband. Requiring recipients of government funding to provide access to rights of way and utility poles at reasonable rates would also lower the cost of broadband construction and benefit consumers.

Wireless networks are a strategic asset for the U.S. We fell behind Europe during the 3G era, regained our leadership in 4G and now need to sustain and extend it for 5G, the Internet of Things and wireless breakthroughs we can’t yet imagine. It’s vital to build on the steps taken in recent years to free up more spectrum and expand our wireless networks. These issues are not without controversy or difficulty, and require tough choices. But it would be a big mistake to address physical infrastructure without also improving our invisible infrastructure.

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1. [IDC, Intel United Nations from Intel Corporation: “A Guide to the Internet of Things Infographic.”](#)
2. [As referenced in Leslie M. Marx, “Federal Spectrum According to the PCAST Report,” Duke University, referencing President’s Council of Advisors on Science and Technology: “Report to the President: Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth,” \(July 2012\) and Karl Nebbia, Director, NTIA Office of Spectrum Management, Presentation to the Commerce Spectrum Management Advisory Committee \(December, 2009\).](#)

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Mr. Genachowski returned to the private sector after serving as Chairman of the U.S. Federal Communications Commission from 2009 to 2013. He presided at the FCC during a period of robust innovation and investment around communications technology and software, including wired and wireless broadband applications, devices and networks. Under his leadership, the FCC took major actions to extend broadband access, accelerate the roll out of advanced mobile networks, free-up spectrum for wireless communications, preserve a vibrant Internet and media landscape, foster competition and enhance public safety communications. Genachowski also extended the FCC’s international engagement, visiting more than 20 countries, leading U.S. delegations and working on agreements involving global Internet policy, technology, spectrum, national security, cybersecurity and privacy. During his tenure, the FCC was named the most improved agency in the federal government, and one of Wired Magazine’s “Top 7 Disruptions”.

Prior to his FCC appointment, Mr. Genachowski worked for more than a decade in the private sector. As a senior executive and member of the Office of the Chairman, he helped build IAC/InterActiveCorp, which owned and operated multiple Internet and media businesses, including Expedia, Ticketmaster and USA Network. During this time, BusinessWeek named Genachowski one of 25 “Managers to Watch” in the media sector.

Mr. Genachowski has taught a joint class at Harvard’s Business and Law Schools, and served as a Senior Fellow at the Aspen Institute. He has been a board member and advisor to several public and private companies, a Special Adviser at investment firm General Atlantic, on the staff of the Congressional Select Committee on the Iran-Contra Affair and a law clerk to United States Supreme Court Justice David Souter.

He graduated with highest honors from Columbia College in 1985 and Harvard Law School in 1991, serving on the Harvard Law Review with President Barack Obama. Mr. Genachowski has long advised President Obama on technology issues. He is the son of immigrants and led the United States delegation to the 65th Anniversary of the liberation of Auschwitz.

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