



SECTION I

INTRODUCTION



In 2012, the Puerto Rico Broadband Taskforce, working with nonprofit organization Connect Puerto Rico, unveiled the first-ever Puerto Rico Broadband Strategic Plan.¹ This groundbreaking plan aimed to assess the digital divide in Puerto Rico and formulate a series of recommendations regarding twenty-first century technology infrastructure and broadband adoption opportunities to strengthen the economy, increase access to healthcare, and enhance education via technology in Puerto Rico.

To achieve this vision, the Plan set 25 strategic goals for access, adoption, and use of broadband in Puerto Rico, and recommended 40 specific policy strategies aimed at achieving those goals on the Island.

Public and private stakeholders throughout Puerto Rico took note. Since the release of the 2012 Plan, investment in broadband capacity expansion has steadily increased. As of June 2014, 78% of Puerto Rico households had broadband service available at download speeds of 10 Mbps or higher, a sizeable increase from less than 25% of households in 2011. Additionally, 53% of households in Puerto Rico have broadband available at download speeds of 100 Mbps - a percentage that was zero just 4 years earlier. This significant infrastructure build-out demonstrates the evolving demand for broadband market growth.²

According to the Puerto Rico Planning Board (Junta de Planificación) Strategic Plan for the Information sector in Puerto Rico, the Information sector has experienced an annual growth rate of 3.8% in Puerto Rico and accounted for \$2.6 billion (2.5%) of Puerto Rico's Gross Domestic Product in 2013, surpassing other major industries such as construction, which accounted for \$1.381 billion of the Island's 2013 GDP.³

Yet, the 2012 Broadband Strategic Plan was only a step toward expanding broadband access, adoption, and use on the Island. As the Plan explained, "this process will not happen overnight and will require waves of reform, coordination, and adjustment across multiple agencies and functions of government, and the private sector. As such, this Broadband Strategic Plan - the first one of its kind for Puerto Rico - should be understood as the beginning of a dialogue and action plan, not the end."⁴

Learning from this recent expansion, the present analysis aims to continue moving the broadband capacity goals for Puerto Rico forward and sets new goals that provide Puerto Rico residents, businesses, and public institutions with access to broadband speeds of 1 gigabit per second - **THE GIGABIT ISLAND.**



WHY SHOULD PUERTO RICO BECOME A GIGABIT ISLAND?

The National Broadband Plan unveiled by the Federal Communications Commission (FCC) in March 2010, provided a detailed strategy for maximizing the use of broadband to advance national purposes ranging from consumer welfare, civic participation, economic development, private sector investment, and others.⁵ The National Broadband Plan's fourth long-term goal provided that "every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings."⁶ In early 2013, the FCC expanded this call to action by challenging broadband providers as well as state and municipal community leaders to work together to meet a "Gigabit City Challenge" of at least one gigabit community in all 50 states by 2015.⁷

"... [S]uper-fast, high-capacity, ubiquitous broadband networks delivering speeds measured in gigabits, not megabits, isn't just a matter of consumer convenience, as important as that is. It's essential to economic growth, job creation and ... competitiveness."

- Forbes

Gigabit communities are defined as "the roll out of [fiber-to-the-home] infrastructure that can provide broadband subscribers with access to gigabit speeds."⁸ Gigabit-per-second connectivity is approximately 100 times faster than the average fixed high-speed Internet connection.⁹ At stake, however, is not just the ability to obtain and share information seamlessly and instantly, but the ventures and possibilities that this connectivity will unleash.



Despite the nascent nature of gigabit communities and the technology clusters that emanate from this hyper-capacity, available research suggests that the economic impact of gigabit connectivity is substantial and widespread:

- U.S. cities with gigabit fiber connections report 1.1% higher per-capita GDP than cities that lack such Internet speeds; in monetary terms, this suggests that communities with gigabit fiber networks experience approximately \$1.4 billion in additional GDP.¹⁰
- Homes with fiber access increase in value about five times the cost of connecting the home to the fiber network.¹¹
- Survey data indicates that buyers are willing to pay a two percent premium when purchasing a home or condominium if it is connected to fiber; renters are willing to pay up to a fifteen percent premium.¹²

In today's digital economy in which talent and capital can be recruited from and delivered to any location, the "[a]vailability of next generation broadband has risen dramatically in eyes of economic development professionals for what is required to

attract new business."¹³ Widespread gigabit connectivity can help solidify Puerto Rico's citizens' and organizations' ongoing participation in the worldwide knowledge economy in which value is generated through innovation in information and services,¹⁴ and competition on a global scale.

"Providers and governments around the world all agree that unlocking the potential of broadband requires taking optical fiber all the way to subscribers' doors. Everyone also agrees that fiber will meet the world's needs for the foreseeable future. The only debates involve the speed of the transition."

-Broadband Communities



The 2012 Puerto Rico Broadband Strategic Plan established this vision.

Puerto Rico needs broadband access that is fast, robust, redundant, and ubiquitous to meet the economic challenges of the twenty-first century, ensure continued competitiveness of our business community, help contain the cost of government and social services, and ensure that all Puerto Ricans continue to partake in the social discourse that is increasingly taking place online.

A robust twenty-first century Island-wide broadband infrastructure is essential, in both urban and rural areas and across higher and lower income communities . . . The networks that support broadband service and connectivity across the Island will stand as a barrier to twenty-first century growth and competitiveness if they are inadequate to meet the capacity demanded by Puerto Rico's consumers and businesses. On the other hand, with a robust broadband infrastructure, there is nothing that prevents the establishment of Puerto Rico as a key target of direct foreign investment and as the central point of broadband and information economy commerce for the Caribbean and the Southern Hemisphere.¹⁵

The same holds true two years later; however, the connectivity speeds to achieve these goals have increased significantly.

A Gigabit Community Cedar Falls, Iowa

Cedar Falls was one of the first communities in the U.S. to have ubiquitous fiber gigabit connectivity, as well as one of the first communities in the nation to become a certified Connected community as part of Connected Nation's Connected Community Engagement program. Cedar Falls' municipal utility, Cedar Falls Utility (CFU), was also among the nation's first providers to offer high-speed Internet service in 1996. In May 2013, CFU began offering gigabit service to every Cedar Falls home and business through a new citywide fiber optic network. This network upgrade required three years, during which time CFU invested not only in the framework for high-speed connectivity, but also in three separate pipelines to ensure consistent, reliable service.⁷⁹ Citing the need for economic growth and competition, in January 2015 President Barack Obama launched a national community broadband initiative during a speech in Cedar Falls. The initiative will focus various federal agencies and programs on the need to continually expand access to fast, high-quality broadband networks.⁸⁰



THE GIGABIT ISLAND GOALS

“Gigabit Island” status requires a policy framework that will encourage public and private investment in broadband capacity build-out and growth. To do so, the Gigabit Island Plan proposes the following goals:

- By 2018, 90% of Puerto Rico households will have broadband available at download speeds of 10 Mbps.
- By 2018, 50% of Puerto Rico households will have broadband available at download speeds of 1 Gbps.
- By 2020, 99% of Puerto Rico households will have broadband available at download speeds of 10 Mbps.
- By 2020, 70% of Puerto Rico households will have broadband available at download speeds of 1 Gbps.

These goals are in line with Puerto Rico economic development plans detailed by Governor Alejandro Garcia Padilla in his Agenda for Economic Revitalization, 2014-2018,¹⁶ and consistent with U.S. definitions and expectations for broadband growth. In December 2014, the FCC adopted new capacity standards for broadband networks that are built with support from the FCC’s Universal Service Fund (USF). Under the new rules, broadband networks benefiting from these subsidies must meet speeds of at least 10 Mbps download and 1 Mbps upload, significantly upgrading the previous standard of 4 Mbps down/1 Mbps up. After consideration of current consumer broadband usage patterns and the proliferation of Internet users and connected devices, the FCC concluded that a connection of 10 Mbps download speeds is necessary to meet the demand of a three-user household with moderate broadband usage patterns.¹⁷

This Plan outlines a strategy for public and private stakeholders to work together to make this vision of a Gigabit Island possible. The Plan places particular focus on three key developments affecting growth in the Puerto Rico broadband market:

1. factors affecting investment in broadband build-out;
2. expansion of broadband adoption and evolution of use among Puerto Ricans; and
3. the role of high-speed broadband in the twenty-first century education sector.

A Gigabit Community Chattanooga, Tennessee

Chattanooga’s fiber-optic network was first developed in 1996 when the city’s Electric Power Board (EPB) authorized the first phase build-out of a communications network to connect electrical assets.⁸¹ Underutilized for its initial years, in 2007 the Board approved a plan to use the network for fiber-to-the-home services. The following year the city granted EPB a franchise to achieve this purpose, and in 2010, Chattanooga launched its gigabit broadband network.⁸² Rebranding itself “the gig city,”⁸³ gigabit service is now available to 170,000 educational facilities, residences, and businesses, equating to 600 square miles and several hundred thousand people.⁸⁴ Chattanooga credits its gigabit fiber network with helping attract corporations such as Amazon and Volkswagen to the area and creating more than 3,700 jobs.⁸⁵



Focusing on these areas, the Plan analyzes trends in the Puerto Rico broadband market over the last four years, evaluates the evolution of key policy strategies outlined in the 2012 Puerto Rico Broadband Strategic Plan, and establishes new broadband goals and strategic policies that will help achieve the Gigabit Island vision.

What Does Gigabit Connectivity Enable?

According to Google Fiber, gigabit capability enables consumers and businesses to stream high-definition videos, movies, and television shows with little to no delays or buffering; experience an improved online experience, even when multiple devices (e.g., smartphones, computers, gaming systems, televisions, and more) and users connect to the network simultaneously; videoconference through sites such as Skype and Google Hangouts; download files, images, and videos in only seconds; and more.⁸⁶ Specifically, users of a gigabit per second connection can:

- Stream—without buffering—at least 5 high-definition videos (1080p) at the same time and still have enough bandwidth to e-mail and surf the web.
- Transfer data over the Internet faster than writing data to a thumb drive.
- Download data as fast as many computers can save the data to a hard drive.
- Download an entire digital movie (14 GB) in a little less than 2 minutes.⁸⁷

However, the benefits of gigabit connectivity expand far beyond the individual user.

- U.S. cities with gigabit fiber connections report 1.1% higher per-capita GDP than cities that lack such Internet speeds; in monetary terms, this suggests that communities with gigabit fiber networks experience approximately \$1.4 billion in additional GDP.⁸⁸
- Responding to economic growth, research demonstrates that homes with fiber access increase in value about five times the cost of connecting the home to the fiber network.⁸⁹
- Similarly, survey data indicates that buyers are willing to pay a 2% premium when purchasing a home or condominium if it is connected to fiber; similarly, renters are willing to pay up to a 15% premium.⁹⁰



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