

# Study shows relationship among broadband performance, pricing, and demand worldwide

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Almost exactly three years ago, the United Nations called on governments and industry to ensure that the world's population would have access to broadband Internet by 2015.

Broadband, a relatively fast and always-on Internet connection service, is one of the most economically significant and fastest growing sectors of the Internet.

"Over the past few years, a growing importance has been placed on [broadband](#), and national plans have emerged to ensure coverage," said Fabian Bustamante, professor of electrical engineering and computer science at Northwestern University's McCormick School of Engineering. "Several governments and the United Nations consider it a basic human right—on the same level as access to education and water."

Several studies have attempted to characterize broadband's availability, but none have examined broadband services in their larger context. Now Bustamante and PhD student Zachary Bischof have worked to form a clearer understanding of how broadband services are used, how much bandwidth people actually need, and how the market impacts usage.

By analyzing more than 32 months of data collected from 53,000 end hosts and local networks in 160 countries, along with a global survey of retail broadband plans, the team studied the relationship among [broadband services](#), pricing, and demand.

Documenting their efforts and findings, Bustamante and Bischof will present their paper, "Need, Want, Can Afford—Broadband Markets and the Behavior of Users," at the 2014 Internet Measurement Conference, November 5-7 in Vancouver, British Columbia.

The team found that, despite a fourfold increase in global Internet traffic over the past five years, subscribers' demand in the same bandwidth capacity class remained constant in developed countries. This is because, in most developed countries, users can "jump" to a higher service when their demand grows. For example, users can upgrade their services from downloading speeds of 18 megabits per second (Mbps) to 45 Mbps to meet their needs.

This is in stark contrast to developing countries, where Internet customers maximize the network rather than upgrade services to avoid increasing costs. The cost of broadband Internet service in developing countries is much higher than in developed countries. In Botswana, for example, Internet with a speed of 1 Mbps costs \$150 per month compared to \$20 per month in the United States. These high prices partially mean that a large number of Botswana users have to rely on relatively slow services, hovering around 512 kilobits per second, and thus tend to impose significantly higher loads on these services compared to users in the United States.

"If service becomes faster, then behavior changes," Bischof said. "People start using the Internet even more with faster speeds but, for most people today, that usage appears to plateau when capacity reaches around 10 Mbps."

Bustamante and Bischof said their study can inform policymakers trying to improve broadband availability, pointing out the importance of taking the market and user behaviors into account to ensure the targeted economic and social impact.

"There are people trying to make policy decisions about where to invest in broadband," Bustamante said. "But to guide this we need to understand broadband networks in their broader context."

Provided by Northwestern University

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