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VIEWPOINT

OUTREACH MUST FOLLOW FUNDING TO BOOST BROADBAND ADOPTION

Broadband is as essential as water and power for a strong economy. The desire and funding are now in place, however, access and adoption are not evenly or equitably distributed. Infosys and the Richardson Chamber of Commerce convened an elite group of elected officials, and industry, government, and community leaders to discuss broadband affordability and access. The forum featured a cross-section of stakeholders including CEOs, CTOs, government, and agency leaders. This paper summarizes highlights from the event and synthesizes the insights uncovered from the discussion.

With a once-in-a-generation influx of $65 billion, including a $42.45 billion grant program administered by the National Telecommunications and Information Administration, earmarkedto address the issue, government and industry leaders must work together to orchestrate network buildout and adoption outreach.

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Broadband access creates opportunities for companies, communities, families, and individuals. Government leaders, educators, business, technology, and telecommunication executives all agree. The importance is so critical that the United Nations in 2016 declared internet access to be a human right. Most recently, the COVID-19 pandemic drove home the immense value of access to high-speed, always-on internet.

Because of this, a session was convened in North Texas to explore how to expand broadband access. One of the attendees, U.S. Representative Colin Allred said he was shocked to learn that three out of 10 homes in Dallas County (population 2.6 million) do not have reliable Internet access. The pandemic was not responsible for the gaps in broadband access, but the crisis did shine a light on the flaws in the system, he noted.

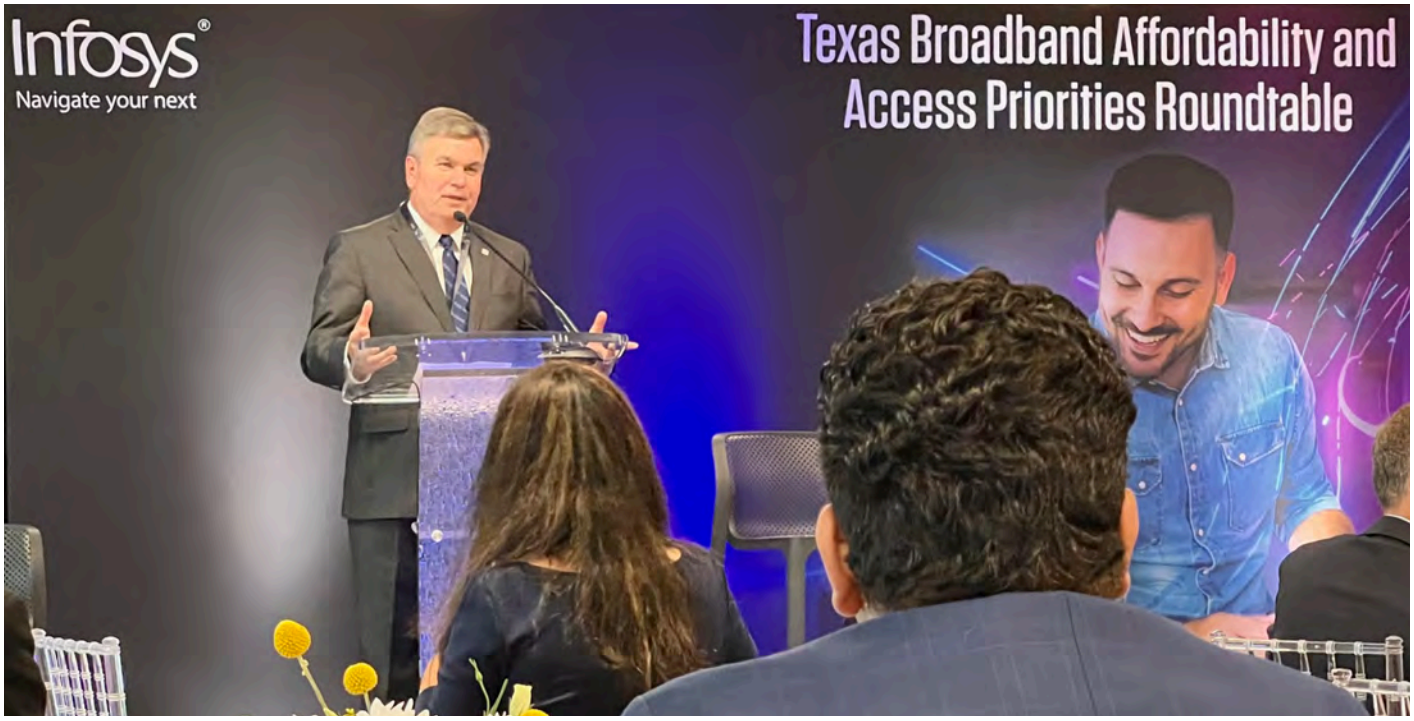
"We saw kids going to McDonald's parking lots to do their homework," he said. "We have to bridge this digital divide that we know is also contributing to other divides in our community. That federal commitment to broadband doesn't just end on the infrastructure side."

Agencies that thought access was in good shape found differently. The leadership of Dallas College, a Texas community college system with more than 100,000 students, thought they would be prepared for a switch to online learning. A large proportion of its students had already enrolled in online classes, recalled Dr. Kay Eggleston, president of the community college district's Richland campus.

"When everyone was sent home, what we discovered is these students were taking their online courses on campus. They were using all the campus resources, the computers, the labs, everything we had. We were thinking they were at home doing online virtual learning, and that wasn't the case," she said.

Congress has provided funding. The U.S. Infrastructure Investment and Jobs Act that passed in 2021 includes $65 billion for broadband, with Texas poised to receive more

U.S. Representative Colin Allred speaks to business executives and civic leaders at Infosys' Texas Broadband Affordability and Access Priorities Roundtable.



Richardson, Texas, Mayor Paul Voelker discusses the value of broadband access for companies and communities at Infosys' Texas Broadband Affordability and Access Priorities Roundtable.

than any other state, Allred said. It's critical that Texas make the most of this opportunity, he added. The largest portion of the $65 billion is $42.45 billion available to states via a grant program administered by the National Telecommunications and Information Administration (NTIA). The NTIA's Broadband Equity, Access & Deployment (BEAD) Program is focused specifically on funding last-mile broadband development.

"This is our largest investment that we've had in our infrastructure since the Eisenhower era [1953-61]," Allred said about the $550 billion legislation. "It's unlikely we'll have another federal bill of this size pass in my lifetime."

But this landmark funding is only the first step toward making broadband equitably available and more affordable. Buildout of systems to rural areas and neglected urban areas presents challenges. And guiding remaining households that have not yet added broadband to do so will require coordinated outreach from community leaders, governments, business executives and educators.

Broadband roundtable

With agreement on the high-level mission and funding in place, Infosys and the Richardson Chamber of Commerce convened an elite group of elected officials, and industry, government, and community leaders to discuss broadband affordability and access. The forum featured a cross section of stakeholders including CEOs, CTOs, government, and agency leaders. This roundtable is the chief research input for this paper.

Allred led off the discussion among Texas political leaders and industry executives convened by Infosys and the Richardson Chamber of Commerce in Richardson, Texas, on June 2.

Other speakers and panelists included State Senator Nathan Johnson, Richardson Mayor Paul Voelker, representatives from public school institutions Dallas College and Richardson Independent School District, and leaders from the Governor's Broadband Development Council, the Texas Broadband Development Office, the North Texas Commission, and the U.S. Chamber of Commerce. They were joined by industry representatives from AT&T, Altice USA (parent company to Suddenlink Communications), Quanta Services Inc. and Charter Communications. (A full list of participants is in the references section.)

All parties expressed high-level agreement to collaborate on key goals, including:

- Expanded access to broadband
- Streamlined permitting
- Sustained outreach programs to improve adoption, identify access gaps and spread awareness of affordability programs
- Continued discussions on standards in terms of what constitutes access, performance, and privacy

This initial gathering achieved its goals to share perspectives, identify friction points and imagine ways to extend broadband access and adoption as widely as possible in Texas.

Infosys aims to convene broadband roundtables in additional regions across the US in the coming months.

Literature review

Much has been written on the technical effort to expand broadband access, and the intricacies of tapping funding sources for fiber network buildouts.

These discussions typically begin with the acknowledgement that broadband has grown to be an absolute necessity for the function of business, government, and community, and then continues with that top-down community approach to covering swaths of territory with broadband access. In the US this literature typically draws from the Federal Communications Commission's Fixed Broadband Deployment map, which tracks the number of providers and their reported download and upload speeds.

However, the detrimental impact for a household or individual lacking reliable, affordable broadband access has only more recently become clear. As noted in writings from the International Monetary Fund, the World Economic Forum, and others, this is one of the many ways the COVID-19 pandemic highlighted and exacerbated existing structural and societal inequalities.

Policy context

Broadband adoption in the U.S. initially grew rapidly but has stalled. One percent of U.S. adults used broadband in 2000. That zoomed up to roughly half of Americans by 2007. However, in the next 14 years, broadband adoption inched up by an average of less than 2 percentage points annually to just 77%. Encouraging the remaining 23% of households without broadband to adopt is increasingly difficult. Equipment access and network information control cause friction and constrain broadband buildout, according to industry representatives. On the adoption front, education leaders and politicians say too many people continue to rely on ad-hoc internet access or institutional support for their primary broadband access. Companies must do more to extend access all the way into households, not just to the curb.

Infosys head of global government and public affairs head Anurag Varma welcomes business and community leaders to the broadband roundtable discussion at Infosys Ltd.'s Richardson, Texas, hub.

Analysis

Our analysis focused on gathering different perspectives to the multifaceted challenges of extending broadband access to near-universal reach, making it affordable to all while compensating providers and boosting adoption as much as possible.

The answers to these challenges can be developed by convening leaders from government, business, technology, education, and community groups for discussion and then following up with action.

On the surface, Texas has achieved high rates of fixed broadband access: 92% of Texans have access to broadband. And upward of 97% of residents in the four most populated cities have access to 100-megabit-persecond broadband.

But broadband access in Texas is uneven. From a household perspective, some 2.8 million Texas households – roughly 22% of households – lack broadband access, according to the Texas Broadband Development Office. The lack of broadband has an outsized impact on rural communities, communities of color and low-income families, the office notes. No single entity is positioned to dictate the method to expand broadband access, adoption, and affordability. Rather, political leaders, agencies and companies must engage in robust collaboration to orchestrate funding, expedite buildout, and support adoption and affordability outreach.

Funding

Congress has allocated $65 billion for broadband buildout. This is a generational outlay comparable to the US rural electrification effort a century ago, but more technical and with potentially greater overall benefits.

Richardson Mayor Paul Voelker states the individual benefits of widespread, equitable broadband access at the household level, will deliver benefits for cities, regions, and employers. Companies seek to do business in places with robust broadband infrastructure and network technology including 5G, optical networking, public and private networking, and mesh networks.

"What's needed are all sorts of things that telecom leaders know how to deploy and implement. These capabilities will differentiate cities, counties, and states," Voelker said.

Dr. Kay Eggleston, president of the Dallas community college district's Richland campus, said homes without broadband also lose access to equal opportunities. Measuring broadband access can help leaders gauge the equity and fairness of opportunities in their communities.

"We want prosperity in our communities. You can't get prosperity just by recruiting companies into the region, without the infrastructure

Infosys and the Richardson Chamber of Commerce convened civic leaders, business executives, technology leaders, educators, and community members to explore ways to expand broadband internet access and adoption across Texas.

and the support to families and communities to thrive and prosper as well," Eggleston said.

Buildout

Even with funding, agreement, and commitment, offering broadband for all is stilled constrained by persistent friction points. Those include control of information, securing work permits and provisioning equipment. Mike Peterson, AT&T vice president of external affairs, said his company has historically worked well with government agencies but is increasingly concerned over disclosure requirements around the details of network systems build outs, information AT&T considers proprietary.

"We'd love to know where Charter [Communications] is building. They would love to know where we're building as well," he said.

For companies building out broadband networks, permitting at this stage is a greater challenge than construction, said Robert McGee, Quanta Services senior vice president of operations, and a member of the Texas Broadband Development Office board of advisors. Quanta Services specializes in planning, designing, and building infrastructure, including power and telecommunication networks.

"When we look at a build from start to finish… construction is the easiest part," McGee said.

Network developers are also now confronting demand-side challenges related to workforce, supply chain, and new requirements tied to "buy American" provisions, noted Matt Furlow, director at the U.S. Chamber of Commerce's Technology Engagement Center. The buy American provisions generally require 55% of a manufactured products to be made in the U.S.

"That is really hard to do, especially for broadband equipment," he said, adding that many companies and states will be competing for the same equipment for their own buildouts. The White House in April 2022 issued guidance on how agencies and companies can request waivers on the Buy American provision.

Outreach

Despite those headwinds, telecommunications providers have excelled at building out a comprehensive network, said state Sen. Nathan Johnson, who represents part of Dallas and its suburbs. The next challenge though is to convert high levels of access to equally high levels of adoption. "The private sector goes out and does a miraculous job of creating this technology, deploying this technology, providing access to close to 100 percent," Johnson said. But even though 90% of Texans have broadband access, less than 70% have signed up for service in their homes.

Gaps in broadband access is also leading to other divides in community

"We've got to be on the ground identifying who really is lacking access and understanding how we give it to them," Johnson said. Sustained collaborative outreach between companies, governments and local agencies will help bring that picture into focus. It's not just the equipment on the network side that must be considered. The effort to deliver broadband more equitably must also capture a clear view of what equipment is available to end-users, said Akbar Kara, president and CEO of the Lonestar Education and Research Network, a fiber optic network provider to education and health care institutions in Texas.

"It's not good enough for my partners in telecom to bring that fast, fast pipe to the front door," said Kara, a member of the Texas Governor's Broadband Development Council. "Some of these community anchor institutions have aged infrastructure. They're still using Wi-Fi hotspots that they bought from Circuit City [a retailer that closed in 2009]. We need to get our policymakers to address this broadband aspect as well. The federal programs do not do that. How are we going to fill that gap, and what role does the industry play?" Kara asked.

On the affordability front, AT&T is working with the United Way to identify families who can benefit, and the company wants to expand that initiative and partner with more organizations, Peterson said. People who have not adopted broadband are generally more likely to trust advocates from their own communities, local organizations, or churches. Local governments can play the role of convener and function as a clearinghouse linking local organizations, affordability programs and service providers. "We haven't cracked the code," AT&T's Peterson said. "We've been connecting with other organizations, but it's going to take all of us to crack this code."

Policy recommendations

Customize solutions to geography and community

The challenge of extending broadband access to all requires collaboration among companies, communities, and all levels of government. The challenge takes different forms in urban, suburban, and rural areas, said Todd Baxter, government affairs vice president for Charter Communications, a national cable television and residential telephone provider. For example, he said that communications infrastructure companies have built large networks in Texas with a good

U.S. Representative Colin Allred speaks to business executives and civic leaders at Infosys' Texas Broadband Affordability and Access Priorities Roundtable. Participants discussed ways to expand access to and encourage adoption of high-speed internet.

amount of "dark fiber," fiber optic communication lines that are installed but not in use. However, they need the help of others to find the holes and gaps in their existing systems in populous areas. "If anyone ever hears of a street or a pocket that is not served, bring it to me," he said. In rural areas with low population density, Baxter said that telecommunications companies will need government partnerships to deliver broadband internet to the last million Texans without a provider. "We're on the precipice of solving the broadband problem in Texas," he said. "And I think everybody in this forum is committed to doing that." According to the Texas Broadband Development Office, three groups predominantly lack broadband adoption: rural communities, communities of color and low-income communities. Each of these groups require their own engagement and involvement in the best ways to establish access, make it affordable and encourage adoption.

Fortify broadband offices through strategic thinking and technical depth

The emerging effort to coordinate industry, agency and government is greatly aided through a dedicated broadband office. This new function addresses a state's particular geographic issues, broadband equity, and buildout coordination efforts. Such offices bring together technical expertise with strategic thinking.

Industry executive Kara asked telecom companies to bring new thinking and consider time to benefit as a new metric for broadband deployment and adoption. This measures the duration from initial request to its provision. "We need to start tracking time to-benefit. You've got web-scale companies that innovate way faster than telecom companies have done in the past. The telecom industry needs to embrace some of the best practices that the web-scale companies are using."

Each state should establish a broadband development office, since agencies, companies and elected officials all seem to agree on the mission to expand broadband access and adoption. A broadband office should serve as formal

coordination point to share concerns and resolve issues related to funding access, network buildout and adoption outreach.

Agree on data, maps, and standards

Many entities from the Federal Communications Commission and those at state and local levels have data and maps for broadband networks across the country. However, these maps do not provide a sharp, street-to-street, building-to-building picture of broadband availability and regular usage.

Kara said efforts are under way at the state and federal level to increase visibility of broadband access from census-block to individual address level.

"The initiatives in place now will demystify availability is and access," he said.

Streamline permitting and achieve network consensus

Federal and state money is on the way to fund network buildout. However, public and private stakeholders must also take steps to convert these highly anticipated dollars to fair and maximum impact.

Governments on all levels must establish permitting standards, streamline routine processing, and set clear schedule expectations that protect public interests and apply fairly to all network operators.

Private network operators view their network details as proprietary, but they are deploying networks in public rights of way. As an industry, telecommunications companies must develop a clear consensus on their network technical and planning details that can be shared and what must be kept proprietary.

Implementation

In the 21st century, broadband is as essential as electricity and water in the 20th century. However, developing equitable access to broadband is more challenging than stringing copper wires or plumbing water mains.

The challenge to expand broadband varies by geography and requires different solutions in rural, urban, greenfield and brownfield contexts. Delivering and maintaining quality broadband is not as obvious as clean water and stable power supplies. Further, the definition of adequate broadband access remains unclear.

Public and private sectors need to better coordinate and collaborate to address these more nuanced problems tied to broadband.

"Broadband is a basic infrastructure necessity," said Chris Wallace, CEO of the North Texas Commission, a regional public-private advocacy group. "It supports every mode of transportation. It goes along with water infrastructure. Without this basic infrastructure system, people cannot function."

While entities collaborate to deliver basic infrastructure, they also need to evolve the definition of basic broadband, aligned with technological progress, and this requires frequent refinement and update.

Build broadband now... for the future

The FCC's current standard for broadband — 25 Mbps downstream and 3 Mbps upstream — was last updated seven years ago and is no longer sufficient for the way that modern families work, play, and learn from home. "… Every time we have a technology advance in one area, we see another one that requires more firepower," said Johnson, the state senator.

The byproduct of continued growth in Texas could additionally strain network infrastructure, Johnson noted. "We're going to add 10 million people before the 200th anniversary of the state of Texas (in 2036)," he said. "That's growing our population by a third. So we're going to continue to work with industry to deploy the physical infrastructure as well as continue to increase affordability and make sure that everybody has the digital literacy to take advantage of broadband."

The value of reliable broadband access has grown more distinct to Texans and indeed all Americans living through the COVID-19 pandemic. Conversely, the disadvantages facing households that lack access or can't afford broadband have multiplied.

In an increasingly digital society, expanding access and encouraging equitable adoption of broadband is the shared responsibility of government, business, and community organizations. Early adopters and easy converts have already shifted to broadband. The remaining population and literal last miles will be the toughest to cover, and the remaining households without broadband will also be the most reluctant to adopt. No single party can drive adoption on its own. While broadband for all will help many more citizens to participate in the American dream, it is also an example how infrastructure can bring together multiple diverse groups for a common and commendable goal.

References

June Forum participants

Elected officials

U.S. Representative Colin Allred, Dallas

State Senator Nathan Johnson, Dallas

Mayor Paul Voelker, Richardson, Texas

Industry, government, and community leaders

Todd Baxter, Group Vice President, Government Affairs, Charter Communications

Dr. Kathryn Eggleston, President, Richland Campus, Dallas College

Matt Furlow, Policy Director, Chamber Technology Engagement Center, U.S. Chamber of Commerce

Henry Hall, Chief Technology Officer, Richardson Independent School District

Akbar Kara, CEO, Lonestar Education and Research Network (LEARN), Member, Governor's Broadband Development Council

Robert McGee, Senior Vice President - Operations, Quanta Services Inc.; Member; Board of Advisors, Texas Broadband Office

Johnny Moyer, Director of Government Affairs, Altice USA

Mike Peterson, Vice President, Texas External Affairs, AT&T

Chris Wallace, CEO, North Texas Commission

Chris White, Vice President, Global Technology Solutions, Verizon

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