Community Wi-Fi Reimagined: How You Can Succeed Where Others Have Failed

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About the Author

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Candice started her career in telecommunications in sales at a national ILEC, followed by 14+ years as the Director of Marketing, Product Management, and Analytics for a fiberoptic voice, video, and data provider.

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INTRODUCTION

The ability to provide safe and secure public Wi-Fi promises to deliver a range of benefits for communities. Access to Wi-Fi hotspots is a driver of economic growth and a way for citizens to access a variety of public services, including education and healthcare. And yet public Wi-Fi projects often fail to deliver on these promises—regardless of whether they're operated by a municipality or a private company.

And yet community Wi-Fi continues to represent a largely untapped market opportunity for broadband service providers (BSPs). It is an opportunity to differentiate from the competition and embed their brand deeply into the communities that they serve. But how can BSPs replicate the successful residential managed Wi-Fi experience outside of the four walls of the home?

Chapter 1

A NEW ERA FOR COMMUNITY WI-FI

The availability of Wi-Fi is a key driver of the global economy. According to the Wi-Fi Alliance, the global Wi-Fi market was valued at $3.3 trillion in 2021—and is forecast to be worth $4.9 trillion by 2025. The economic impact of Wi-Fi includes productivity gains, expanded work opportunities, and—in the case of free Wi-Fi—the ability to connect people to the internet who were previously underserved.

The United States is one of the most mature Wi-Fi markets in the world. Citizens benefit from widely deployed Wi-Fi infrastructure, both privately—at their homes and workplaces—and increasingly in public settings. The U.S. Wi-Fi market was worth almost a trillion dollars in 2021. It is expected to hit $1.58 trillion by 2025, driven by new Wi-Fi spectrum allocations (notably in the 6 GHz band) and the adoption of new technologies such as Wi-Fi 6.

Most U.S. citizens subscribe to in-home broadband services to access Wi-Fi in their home. Even cellular-enabled devices connect to Wi-Fi networks 55 percent of the time, as Wi-Fi is usually a faster and more stable way to connect compared to a cellular network. The COVID-19 pandemic further accelerated Wi-Fi usage as citizens increasingly relied on hotspots to work, school, and play remotely.

Free public Wi-Fi makes up only a minority of the total Wi-Fi footprint. According to Cisco, there are 33.5 million private Wi-Fi access points in the U.S., compared to 18.6 million free hotspots. In economic terms, free Wi-Fi only accounts for 2.5 percent of the total market (see table on following page) and is forecast to decline in value over the coming years.

	2021	2022	2023	2024	2025
Free Wi-Fi	$25.7	$23.3	$19.7	$15.2	$13.8
Residential Wi-Fi	$407.4	$472.7	$544.9	$620.1	$705.6
Enterprise Wi-Fi	$337.3	$379.0	$422.6	$487.7	$565.2
Carrier Wi-Fi	$71.8	$29.4	$12.7	$14.5	$16.9
Wi-Fi Ecosystem	$152.8	$178.4	$209.0	$241.2	$278.6
Total	**$995.0**	**$1,082.8**	**$1,208.9**	**$1,378.7**	**$1,580.1**

Economic Value of Wi-Fi in the United States by Segment ($ Billions)
Source: Wi-Fi Alliance / Telecom Advisory Services

Various forms of "public" or "community" Wi-Fi have been rolled out—with varying degrees of success—stretching back to the earliest days of the internet. But there is renewed enthusiasm for such projects in the post-pandemic era. This coincides with efforts to bring high-speed broadband to rural areas, alongside trends such as remote working, and population migration away from urban areas.

Demand is therefore growing for a new model of public Wi-Fi that is sustainable, secure, and delivers real value to communities.

"Everyone in our communities should have exceptional internet experiences to learn, work, or maximize opportunities. SmartTown enables us to reach more people where they are with exceptional, hassle-free connectivity delivered at scale."

Brad Moline,
President and CEO, ALLO Communications [source]

Chapter 2

A RANGE OF (UNSATISFACTORY) PUBLIC WI-FI OPTIONS

According to a 2022 survey, almost half (47 percent) of U.S. citizens say they use public Wi-Fi regularly. The main reason (cited by 47 percent of users) was to cut down on cellular data usage when away from home.

The other main drivers were remote working (the top reason for 18 percent of recipients), content streaming (15 percent), and in situations where a cellular signal is not available (11 percent). Only 8 percent of recipients said the main reason for accessing public Wi-Fi was because it was superior to their home Wi-Fi.

The main categories of public Wi-Fi in the U.S. are:

MUNICIPAL WI-FI

Almost every major urban center in the U.S. has some form of public Wi-Fi. New York, for example, has more than 12,000 free Wi-Fi hotspots, the most of any U.S. city. Los Angeles has the second-largest installed base in the U.S. at around 10,000. However, the number of hotspots is often limited in smaller metro areas. A town with a population of 20,000 may only support around 50 hotspots, for example.

These community hotspots are designed to provide citizens with internet access in downtown and other major public areas. In New York, free Wi-Fi is available at subway stations (though not on subway trains), while, above ground, the “LinkNYC” service has repurposed many traditional (and now unused) phone booths into access points.

In most cases, these public Wi-Fi hotspots are free to use for the end user. The cost of running the service is borne by the municipality or supported by advertising (or a combination of both). Criticisms of these services include poor speeds or unstable connections, security vulnerabilities, and a lack of coverage outside of central areas.

PAY-AS-YOU-GO/COMMERCIAL PUBLIC WI-FI

There are plenty of privately operated public Wi-Fi options that are available on a subscription or pay-as-you-go basis. An example is Boingo Wireless, which provides access to more than 1 million hotspots worldwide. An “unlimited” subscription to Boingo currently retails at $14.99 per month. Rival iPass claims to have a Wi-Fi network footprint of more than 64 million hotspots across more than 160 countries.

These providers typically focus on providing coverage in areas such as airports, transit stations, and large commercial buildings. The international reach of some of these providers also allows them to offer roaming packages and even in-flight Wi-Fi. The business model, therefore, targets customer segments such as frequent business travelers and is less focused on community projects.

CARRIER PUBLIC WI-FI

Most large cable and wireless carriers maintain public Wi-Fi as part of their network infrastructure. They typically build their Wi-Fi footprint via acquisitions and partnerships with specialist providers. With the explosion in data traffic over the last decade, Wi-Fi is often used by carriers to support rising data demand, supplementing their main access networks.

Access to carrier Wi-Fi hotspots is usually bundled together with their other subscription services. Comcast’s Xfinity Wi-Fi service, for example, is free to its mobile and business customers, though no longer available on a pay-as-you-go basis. Like most other public Wi-Fi models, carrier public Wi-Fi is concentrated in major public areas and enclosed locations such as airports.

Challenges Facing Traditional Public Wi-Fi

The various approaches to public Wi-Fi all have different strengths and weaknesses. Some public Wi-Fi initiatives failed to gain sufficient market traction, while others have been unable to overcome operational challenges or settle on a sustainable business model. As a result, the sector has generally suffered from a poor reputation among consumers.

Criticisms of current models include:

- **Weak security.** Public Wi-Fi network security can be weak or non-existent, and therefore a target for cybercriminals. Risks include the use of unencrypted networks, malware distribution, and “man-in-the-middle” attacks. Malicious hotspots can also easily mimic legitimate public Wi-Fi systems.
- **Cumbersome registration and user interface.** Registering and logging into a public Wi-Fi service can take multiple steps, often requiring apps to be downloaded first and/or personal details to be submitted. Intrusive advertising can also be a problem.
- **Poor performance.** Reliability can vary widely, making public Wi-Fi often unsuitable for working and studying. Speeds are also likely to be significantly below the user’s home broadband network—and sometimes slower than cellular networks too.
- **Coverage in the wrong areas.** Because most public Wi-Fi networks tend to focus on high-footfall areas and major commercial centers, smaller areas where many communities live and work are often underserved.
- **Poor monetization.** Many public Wi-Fi operators—particularly municipalities—can struggle to make a sufficient return on investment in deploying and maintaining public Wi-Fi.

Chapter 3

HOW PUBLIC WI-FI CAN DRIVE COMMUNITY BENEFITS

The economic and societal benefits of enabling access to high-speed broadband are well established. It is estimated that the proliferation of fixed broadband networks added more than $1.3 trillion to U.S. gross domestic product (GDP) between 2010 and 2020—representing about 10 percent of GDP growth during this period. At the same time, average download speeds increased from 10 Mbps to 174 Mbps.

The U.S. government has also acted to close the “digital divide” between urban and rural areas by providing federal funding for broadband projects in unserved or underserved areas. Most recently, the Broadband Equity, Access, and Deployment (BEAD) program has earmarked $42.45 billion to be distributed at the state level for last-mile broadband.

This offers a myriad of benefits. Broadband adoption in rural areas is linked to economic growth such as increases in jobs and entrepreneurship, rising real estate values, and productivity gains. Broadband also enables better access to education, healthcare, and other vital services—as was evident during the pandemic.

Most fixed broadband relates to connections either at businesses or residential homes. But extending broadband service outside of homes and businesses—via public Wi-Fi—can drive additional benefits for communities, including:

GREATER COMMUNITY ENGAGEMENT

Community Wi-Fi networks can help bring neighborhoods together online and strengthen community cohesion.

IMPROVED DIGITAL INFRASTRUCTURE

Outside Wi-Fi can create rich multimedia experiences for outdoor events, bringing additional tourism and economic activity to rural areas.

OFFLOADING CAPABILITIES

Users can use community Wi-Fi to complement cellular networks, potentially being able to get online faster and without incurring data charges.

DELIVERING SMART INFRASTRUCTURE

Community Wi-Fi can be used to deliver smart city infrastructure such as smart parking and security cameras.

RISING PROPERTY VALUES

Availability of high-speed broadband increases property values and attracts new residents to the area, often from more urban areas. Strong community Wi-Fi can also become a pull factor.

CONNECTING MUNICIPAL SERVICES

Community Wi-Fi can remotely connect students to schools, patients to healthcare, and users to public services such as libraries and e-government.

SUPPORTING EMERGENCY SERVICES

Providing critical connectivity to support first responders and disaster relief services, for example when traditional connectivity infrastructure has failed.

Chapter 4

AN OPPORTUNITY FOR SERVICE PROVIDERS TO BECOME GIANTS IN THEIR COMMUNITIES

Community Wi-Fi represents a largely untapped market opportunity for broadband service providers (BSPs). Advances in technology and the emergence of new business models also mean that new approaches to community Wi-Fi may prove more successful than those undertaken in the past.

Community Wi-Fi Reimagined: 5 Reasons To Extend Managed Wi-Fi Beyond the Front Door

- Differentiation from competitors
- Greater subscriber loyalty and increased "stickiness"
- Enhanced brand visibility across the communities where they are present
- New revenue opportunities
- Ability to maximize return on investments in infrastructure

Community Wi-Fi Reimagined as a Secure Managed Service

Next-generation community Wi-Fi must address the issues that hampered earlier efforts, particularly around security and ease-of-use. One strategy is to replicate the fast and secure Wi-Fi that subscribers experience at home—and extend it into their local community.

This is the principle behind Calix SmartTown™ (SmartTown). It works by extending the existing residential managed Wi-Fi experience beyond the four walls of the home, connecting subscribers to secure Wi-Fi experiences across town, in parks, at outdoor events, and on-the-go.

SmartTown is offered on the Calix platform as a managed service. This dramatically reduces the cost and complexity usually associated with deploying commercial Wi-Fi. Subscribers are activated once and can seamlessly roam between SmartTown hotspots throughout their community.

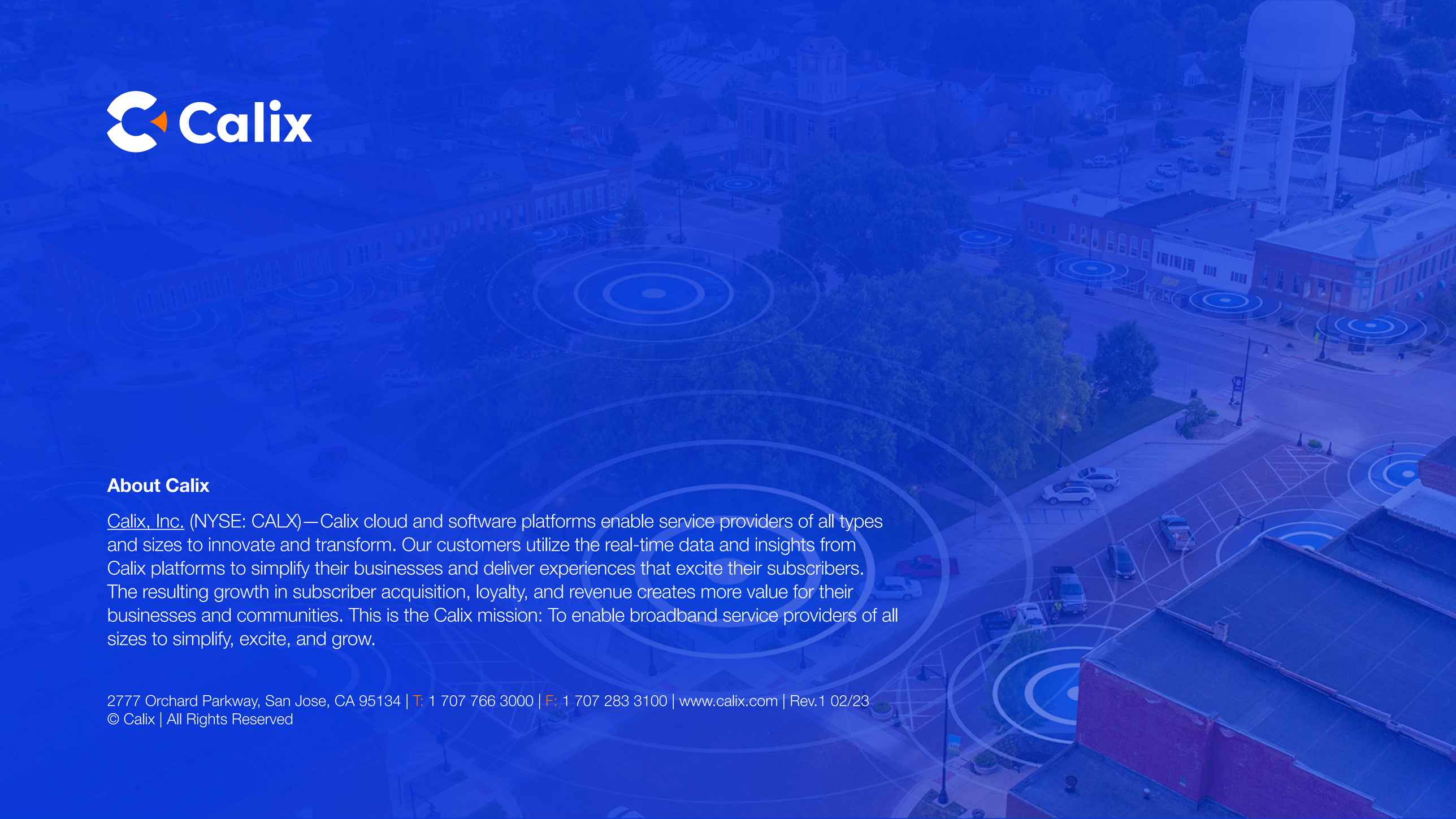
SmartTown builds on the investments made by BSPs in building out fiber infrastructure to these communities. This includes taking advantage of a new era of Wi-Fi systems—such as the Calix GigaPro™ series—designed for outdoor use and able to extend Wi-Fi over longer distances.

CONCLUSION

The availability of Wi-Fi to deliver high-speed broadband brings a myriad of economic and socioeconomic benefits. However, efforts by both municipalities and private companies to deliver public Wi-Fi have delivered mixed results to date. But new approaches to deploying public Wi-Fi are emerging, including for those communities in rural areas and smaller metro areas that were previously underserved. New managed offerings such as Calix SmartTown are enabling service providers to deploy fast and secure Wi-Fi beyond the fall walls of the home—transforming their towns into “smart towns” and positioning them as giants in their communities.

Learn more about Calix SmartTown or request an executive briefing to get started.

Let’s Connect



About Calix

Calix, Inc. (NYSE: CALX)—Calix cloud and software platforms enable service providers of all types and sizes to innovate and transform. Our customers utilize the real-time data and insights from Calix platforms to simplify their businesses and deliver experiences that excite their subscribers. The resulting growth in subscriber acquisition, loyalty, and revenue creates more value for their businesses and communities. This is the Calix mission: To enable broadband service providers of all sizes to simplify, excite, and grow.

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