



AN EXECUTIVE WHITE PAPER

The 5G Playbook for Multifamily Communities

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Introduction

The multifamily industry has shouldered its fair share of change over the last 10 years. Among the many factors shaping that change is the ever-expanding role of technology, which continues to rapidly transform the way we live, work, and play. Consider the confluence of forces impacting the multifamily industry in this new connected era:

- A growing population of Gen Z and millennial residents put technology in the same category as air and water¹
- 5G promises to reimagine every aspect of mobile functionality, connectivity, access, and speed
- The advent of Wi-Fi 6, a functional equivalent of 5G, revolutionizing the in-building online experience
- Thousands of everyday products joining a mushrooming internet of things (IoT) ecosystem, now estimated to top 25.5 billion connections by 2025²
- Continuous demand for safe, affordable rental housing

Many technology investment decisions now confront multifamily decision makers. Making an informed decision prompts questions like:

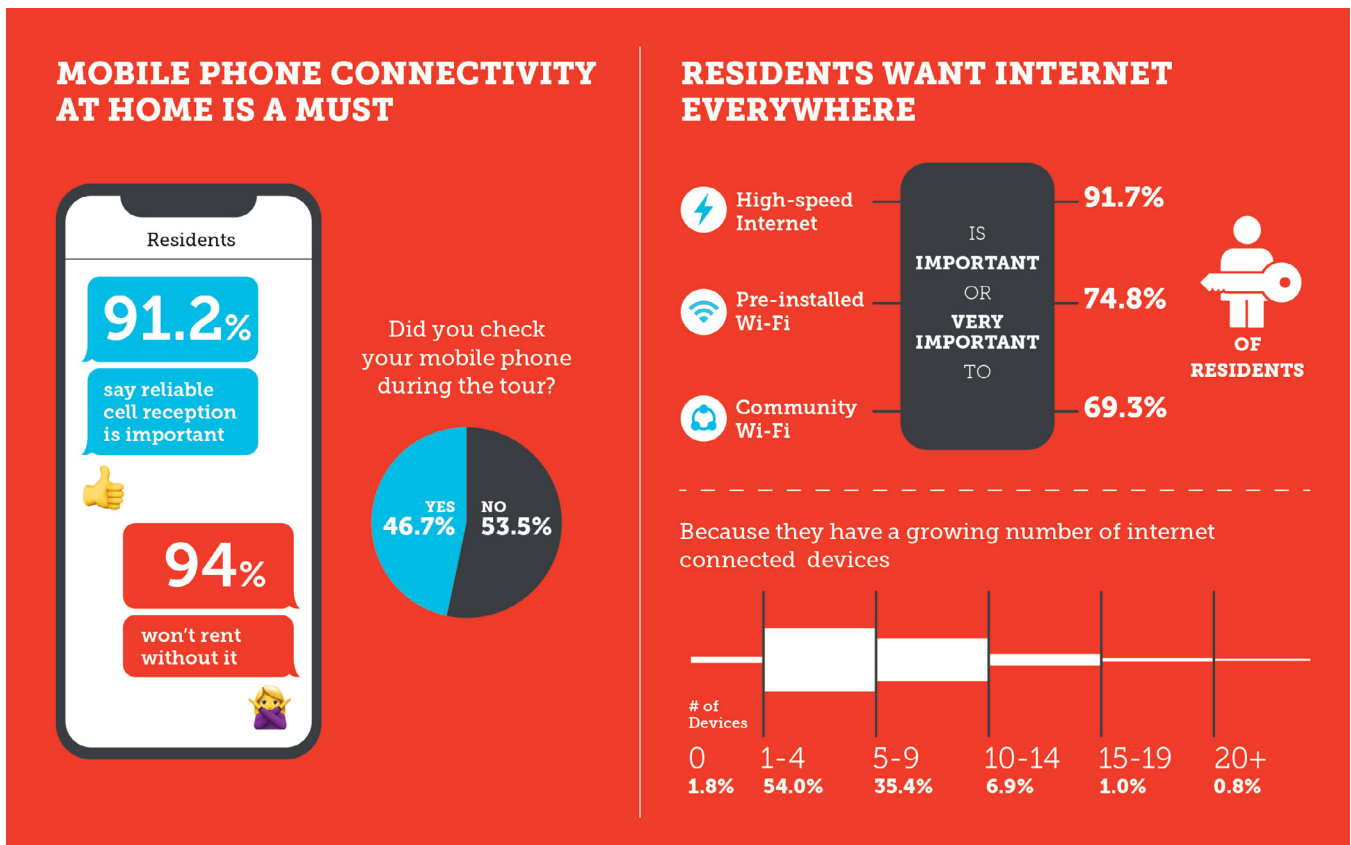
How should I plan for 5G? What is Wi-Fi 6? How will their emergence change renter expectations? What is the best technology-as-amenity strategy? How can you make confident technology bets without risking net operating income (NOI), resident satisfaction and marketplace relevance?

This paper examines those questions and more. It's a 5G playbook for multifamily executives that reviews the present connected landscape at housing communities and what's ahead. It covers how to best prepare for 5G opportunities, exploring decision factors and offering recommendations to formulate a winning outcome for an increasingly challenging, but exciting wireless future.

Situation Analysis

The next decade will see unprecedented demand in the multifamily housing market. In the U.S. alone, 4.6 million new units are needed by 2030.³ Meeting the projected demand requires building more than 460,000 new apartment homes each year on average. Much of the new unit emphasis is on market-rate class A properties, where the competition can be intense. That intensity has given rise to well-publicized amenity wars, such as dog parks and rooftop grilling areas. Technology is at or near the top of every amenity list. In fact, it's arguable that technology has moved outside the amenity arena to take its place as the resident's fourth utility.

Connectivity has never been so important. There's now an expectation for on-demand mobile services such as ride hailing, food and meal delivery, video streaming, online shopping, and all manner of services that cater to resident needs.



2020 NMHC/Kingsley Apartment Resident Preferences Report

Residents' desire for immediacy, convenience, and service in nearly every social and commercial transaction is the demand-driver fueling next-generation networks and massive infrastructure upgrade investments by cellular carriers. All of this puts 5G, Wi-Fi and the Citizens Broadband Radio Service (CBRS) into focus.

5G Has Arrived

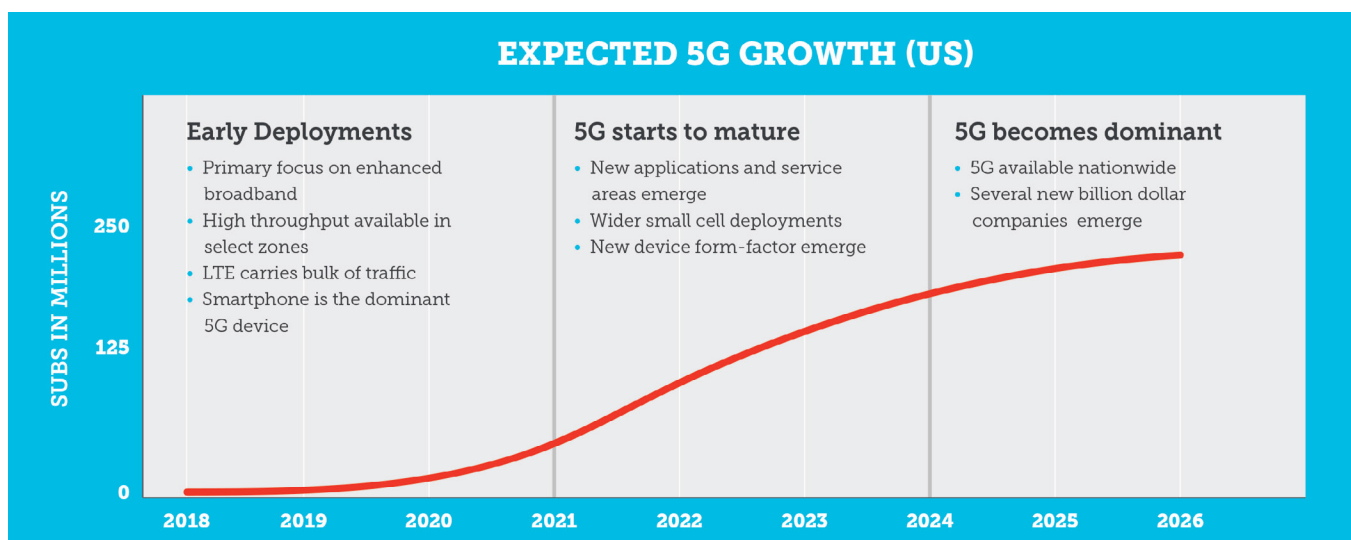
You don't have to look far for the latest *5G-is-here* promotion. What makes the fanfare interesting is this may be one time the reality outpaces the publicity. Consider two of the most prominent breakthroughs that 5G mobile communication is enabling:

- **Much higher data rates**, up to 20 gigabytes per second,⁴ allowing consumers to download, game, stream and browse more content faster
- **Much lower latency** delivering nearly instantaneous response times⁵ that are faster than the human brain

There are many other network advantages, including tenfold gains in connection density and throughput, as well as hundredfold gains in traffic capacity and network efficiency.⁶ It adds up to a wow moment for device users today. Not so far down the road, 5G opens the door to advanced applications like driverless cars, mobile virtual reality (VR) gaming, robotics, and massive-data applications.

5G comes in many flavors and it's important to understand the offerings of each. There are services provided over licensed spectrum by cellular carriers like AT&T, Verizon, and T-Mobile. There are also newer technologies the Federal Communications Commission (FCC) has made available for the 5G era, including CBRS, or Citizens Broadband Radio Service. CBRS operates on the 3.5 GHz band in the U.S. and is receiving heightened attention across the multifamily industry because it provides secure, cost-effective in-building LTE coverage, supports IoT applications and can power private networks. It has a Wi-Fi-like flexible deployment and packs in attractive mid-band features, including coverage, security and density.

From licensed spectrum to CBRS, 5G is in the early phase of rollout, with service available in select locations, such as major sports stadiums and airports. The limited coverage area is due in part to the few devices today that are 5G-enabled, but device manufacturers are catching up. Broad consumer use is coming fast. Expect 5G network providers to continue promoting the technology with aggressive awareness campaigns that result in rapid consumer adoption. This build-up offers multifamily operators a small window to plot a post-4G technology strategy. A 5G action plan is critical and 2020 is the year to put it in motion.

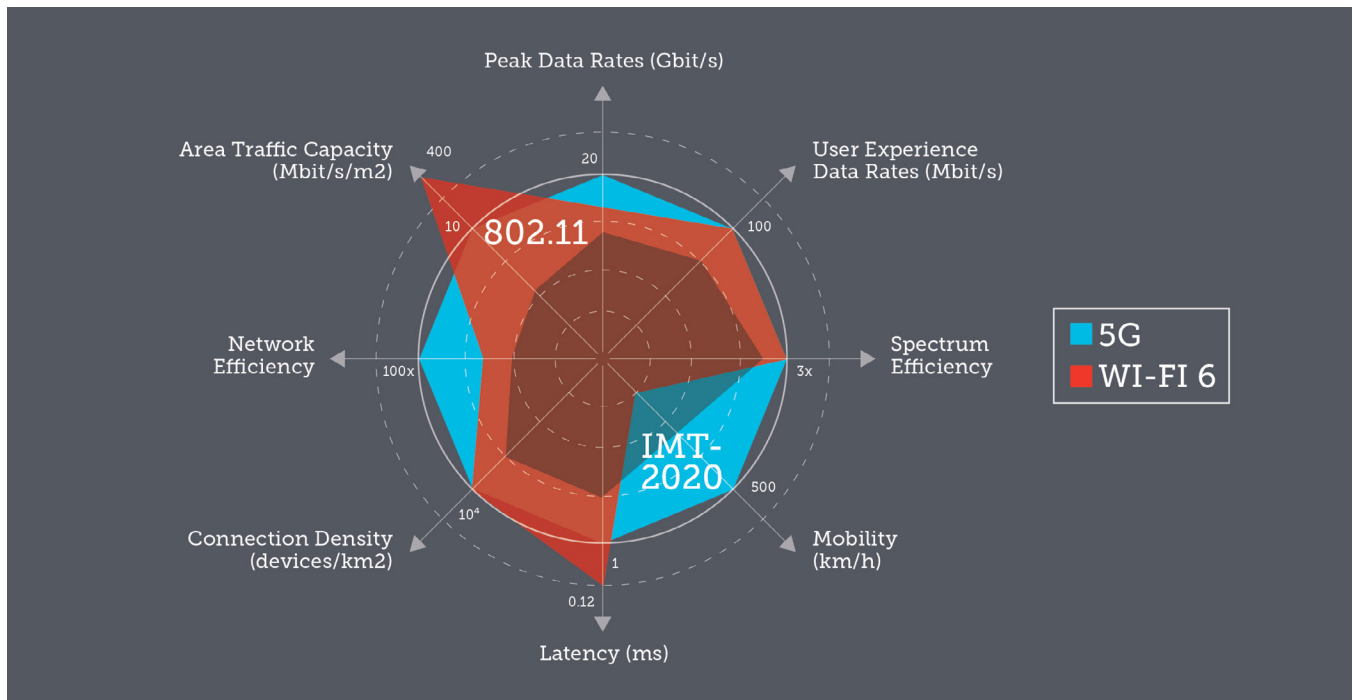


Consumer Technology Association / Chetan Sharma Consulting, 2018

Role of Wi-Fi 6

Not nearly so hyped as 5G, Wi-Fi 6 is a real game changer for multifamily properties. While its emergence has been quieter, Wi-Fi 6 will soon be roaring throughout multifamily housing communities with features that closely mirror 5G.

This illustration depicts the interconnecting dimensions of Wi-Fi 6 and 5G.



Wireless Broadband Alliance

Wi-Fi 6, technically known as 802.11ax, nearly seems like it was engineered from the ground up to exclusively improve the lives of multifamily operators and residents. Consider it offers:

- **More throughput.** Four times better throughput in dense environments (compared to current Wi-Fi performance).⁷
- **Faster throughput.** Delivers up to 40% higher peak data rates for a single device.⁸
- **Improved network efficiency** with several breakthrough enhancements including subchannels, multiple device management, and wireless access points.⁹
- **Improved device battery life** with a new power-saving technology called target wake time.¹⁰
- **Compatibility with Passpoint** to facilitate seamless roaming between cellular and the property's Wi-Fi network. Passpoint is a next generation hotspot technology that makes connecting to Wi-Fi easy and secure.
- **Improved privacy** with WPA3, the first major Wi-Fi security development in over 15 years.

For most apartment buildings and other high-density environments, Wi-Fi 6 addresses most of the deficiencies associated with current Wi-Fi service. The new standard increases speeds at 2.4 GHz, a portion of the spectrum better at penetrating walls than 5.0 GHz.¹¹ Old 2.4 GHz worries like interference from cordless phones and baby monitors have largely fallen away as these products disappear from the marketplace.

Wi-Fi 6 is superbly positioned to be the data delivery workhorse. Device makers have quickly responded. The Apple iPhone 11 supports Wi-Fi 6. Many other device makers, such as Samsung, have similarly released or are about to release Wi-Fi 6-supported products.¹² The FCC is also looking to release new spectrum—the 6 GHz channel—solely for the operation of Wi-Fi 6 devices.

Rise of Convergence

The convergence of two powerful data delivery platforms—5G and Wi-Fi 6—usher in a remarkable time for multifamily technology planners.

Now is the time to weigh how to best deliver an improved online and IoT experience. Stephanie Fuhrman, managing director of global innovation at Greystar, understands the challenges for multifamily operators.

“There’s still a lot of fragmentation in the industry as it relates to an overall technology strategy,” she says. “It’s not as efficient as ordering something on Amazon. Residents today have a very high intolerance for a lack of Wi-Fi and cellular service anywhere in the building. There are gaps where a [digitally] dark hallway is a frustration. When they move into our communities, they expect no compromise in service.”

The frustrations of dark hallways, common areas, rooftops, and dog parks that property owners and managers now face with poor 4G cellular service will continue unabated with 5G. A 5G network does not automatically solve pre-existing connectivity issues and can drop signals indoors. What is required is a seamless convergence of LTE and 5G mobile networks with Wi-Fi. This approach meets residents’ continuous expectations for high-speed mobile data service anytime, anywhere on the multifamily property.

The Playbook

Convergence is part of the 5G era playbook for risk-averse multifamily decision makers. Decision-makers should consider these key components within a successful technology and wireless strategy.

- 1. Plan now.** 5G and Wi-Fi 6 are here. 2020 will see more and more residents purchasing 5G-enabled smartphones and devices in anticipation of network rollout. Now is the time to work with your technology partners to form and implement a flexible strategy that makes the most of the user experience that residents demand and expect.
- 2. Embrace a managed Wi-Fi solution.** The rapid proliferation of wireless devices puts new demands on Wi-Fi networks. Wi-Fi 6 goes a long way to improving the resident experience. However, what Wi-Fi 6 does not do on its own is offer management tools, reports, and alerting features that improve operational insight and control. Is there a high-volume traffic issue in a certain unit? Has the system been breached by a hacker? Is the system corrupted by a virus? A managed solution with enterprise-grade monitoring capability is a powerful tool for property owners and managers. Plan for this business model when mapping out Wi-Fi 5 to Wi-Fi 6 upgrades.
- 3. Consider CBRS.** CBRS can be a cost-effective way to improve cell coverage throughout a community. It promises the quality-of-service, security, and roaming benefits of a cellular connection, with neutral host deployability similar to Wi-Fi—and can come at less than half the cost of a DAS.¹³ The CBRS ecosystem is nascent, but expect it to mature throughout the early 2020s as carriers adopt CBRS roaming business models and the number of CBRS-capable phones reaches critical mass. While the CBRS ecosystem matures, savvy property owners have begun coordinating with their technology partners and installing cabling on new construction projects, in anticipation of installing CBRS networks in the near future, by 2021.
- 4. Prioritize convergence.** Don't view 5G as a technology, view it as an experience. Varying technologies, from cellular to Wi-Fi to CBRS can power that experience. Put in place a strategy that seamlessly extends 5G experiences inside the property with performance that's equivalent or better to what residents get outside the apartment community.
- 5. Stress resident security and privacy.** The on-demand generation's increasing reliance on wireless data delivery for work, entertainment, finances, and social and professional matters presents an irresistible target for skilled criminals. Residents' security and privacy are becoming increasingly important differentiators for apartment communities. Security strategies should incorporate a layered cybersecurity architecture and gateway solution with features that include behavioral analytics, device isolation, encrypted critical systems, vulnerability scans and intrusion prevention and detection.
- 6. Integrate IoT.** Many, if not most, multifamily operators are actively testing or rolling out smart thermostats, door locks, and other smart applications at the unit or building level. How should the IoT factor into a cogent wireless strategy? Specifically, what are best practices for resident accessibility and unit security?

To underscore the growing role of IoT technology in multifamily developments, new companies like STRATIS have come onto the scene. STRATIS makes a mobile app that facilitates the aggregation of multiple IoT devices on residents' smartphones. For the residents, the app is an extra measure of daily convenience and a welcome amenity. For multifamily owners and operators, the app is a critical layer of extra security and management control. Felicite Moorman, STRATIS founder and CEO, says, "Last year we were deployed in one of five new developments. This year we're already specified in one of four developments." IoT technology is an increasingly expected part of the tenant experience and goes hand in hand with a managed Wi-Fi approach.

7. Align with trusted partners. With so much at stake, it makes sense to identify technology partners that safeguard your reputation, follow best practices and demonstrate broad experience. Technology is becoming increasingly complex. Instead of managing its many layers, pick one partner who not only manages it all, but can advise on necessary upgrades throughout the 5G era. Fuhrman advises that alignment with "a company who has a solid reputation to protect is something you should consider when selecting partners."

8. Think big picture. A rush to cobble together a piecemeal, incremental strategy to "make up for lost time" is an understandable response to a wave of groundbreaking technology advances and competitive pressures. It's a temptation that must be tempered with a disciplined, orderly strategy that respects budget, residents' needs, and NOI.

Moorman understands. "The multifamily sector was tech-neglected for so long. Look at hospitality, for example. Electronic access has been a part of hotel technology for decades. However, this is not the time to rush things. Yet only a handful of properties with whom we work today have a technical due diligence team."

Take Control of Your Network

Time and technology are on the side—for now—of multifamily owners and operators to devise a sensible and winning 5G game plan.

Few industry experts dispute the fact that Wi-Fi and ultimately Wi-Fi 6 are core components to any enduring multifamily wireless strategy. The relative economy, tested capability, and next-generation performance characteristics guarantee that it will continue to serve as the data delivery workhorse. Cisco predicts Wi-Fi will carry 57% of all internet traffic by 2022.¹⁴ 4G and 5G? No more than 22% combined by 2022.¹⁵



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– Felicite Moorman,
STRATIS founder and CEO

As you consider your options, keep Fuhrman’s cautionary words in mind about partner selection. Identify a company that has built a long record of accomplishment in demanding high-density housing environments.

Boingo Chief Technology Officer Dr. Derek Peterson is working with leading multifamily owners and developers on 5G upgrade strategies. His 5G advice is to take control of your network and not leave it solely to the carriers.

“Cellular will sit alongside CBRS, Wi-Fi 5, Wi-Fi 6, Bluetooth, IoT, you name it,” said Dr. Peterson. “Work with a provider like Boingo who knows the ins and outs of a 5G playbook and can manage all of it while creating new business opportunities. It’s easy to get lost in the 5G hype, but focus on the 5G experience of fast speeds, low latency and high density and you have a recipe for success.”

Conclusion

Finding a technology partner who can address wireless challenges is a foremost priority. When navigating partnerships, make no exceptions across trusted and tested leadership, resources, innovation, and a neutral host, tech-agnostic philosophy. Your partner should check these boxes:



Wi-Fi solutions proven in leading multifamily developments, Class A commercial real estate properties and other challenging and densely populated venues.



Proven convergence offerings like Passpoint that seamlessly mesh outside-the-apartment 5G with inside-the-apartment Wi-Fi, creating a seamless automatic handoff that improves the resident experience and the multifamily operator’s competitive positioning.



Expert in CBRS deployments who can power 5G experiences using new LTE technologies.

The way forward for multifamily owners and operators is a bright one. For multifamily leaders, the promise of 5G and Wi-Fi 6 offers property control, data security, and resident convenience features that can be a differentiator. Observing playbook recommendations also lifts the resident experience by enhancing the entertainment, social, and professional applications they have come to rely on.

As you weigh your technology options and investments, keep these suggestions in mind and look to experts like Boingo. The months ahead are a time of decision and opportunity as the multifamily industry and society at large are once again transformed by the leap of technology.

- 1 Source: <https://www.houstonhispanicchamber.com/assets/docs/Marketing%20to%20Millenials%20Data.pdf>
- 2 Source: <https://www.gsma.com/newsroom/press-release/new-gsma-study-5g-to-account-for-15-of-global-mobile-industry-by-2025/>
- 3 Source: <https://www.naahq.org/news-publications/united-states-needs-46-million-new-apartments-2030-or-it-will-face-serious-shortage>
- 4 Source: <https://www.newsweek.com/2019/05/10/gaming-picks-speed-1408910.html>
- 5 Source: <https://www.cnet.com/news/how-5g-aims-to-end-network-latency-response-time/>
- 6 Source: <https://pdfs.semanticscholar.org/9985/884596b7c4143b0f11ecf9febcb7f7686eb.pdf>
- 7, 8, 9, 10 Source: <https://www.theverge.com/2019/2/21/18232026/wi-fi-6-speed-explained-router-wifi-how-does-work>
- 11 Source: <https://help.sonic.com/hc/en-us/articles/115010629788-Wi-Fi-2-4GHz-vs-5GHz>
- 12 Source: <https://www.cnet.com/how-to/wi-fi-6-explained-everything-you-need-to-know-about-the-wireless-tech-in-the-galaxy-s10/>
- 13 Source: https://www.cbrsalliance.org/wp-content/uploads/2019/02/SenzaFili_CBRS_DeepDiveReport.pdf
- 14 Source: <https://www.ncta.com/whats-new/3q-how-more-unlicensed-spectrum-could-impact-america>
- 15 Source: <https://www.cnet.com/news/no-5g-isnt-going-to-make-your-4g-lte-phone-obsolete/>

White Paper Partner



Boingo Wireless (NASDAQ: WIFI) is a leading provider of connectivity solutions for multifamily housing properties, serving over 300,000 residents across more than 2,200 communities around the world. Its instant-on Wi-Fi connects residents in their apartment units and everywhere throughout a community with fast speeds and secure network authentication. Networks are 5G and IoT ready and engineered for high bandwidth applications including streaming and gaming. Learn why multifamily owners are partnering with Boingo to enhance the resident experience and increase NOI and property value by visiting boingo.com/multifamily.

[Meet Boingo for Multifamily ▶](#)

FOR MORE INFORMATION

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