

# SAN JOSÉ COMMUNITY BROADBAND

Empowering connectivity: America’s fastest free Wi-Fi with RUCKUS enabling a more connected community



Third-largest city in California

Nearly 1 million residents

Residents speak more than 56 languages

One of the safest big cities in America



Customer  
The city of San José

Location  
San José, CA

## Key challenges faced:

- Building America’s fastest free community Wi-Fi®
- Bringing high-speed connectivity to underserved neighborhoods
- Maximizing coverage without causing interference
- Minimizing deployment time and cabling needs

The city of San José is in the heart of Silicon Valley in California. It’s one of the wealthiest major cities in the world, behind Zürich and Oslo. It’s the 12th-largest city in the United States and the largest city in Northern California.

## Access SJ Downtown

Access SJ Downtown started as an outdoor network in downtown San José to revitalize businesses and encourage visitors and residents to stay downtown, spend money on retail and restaurants, and generate revenue for the city services. What started as a marketing ploy to attract more businesses and tourists soon became the city’s rallying cry. Why not offer blazing internet speeds to parts of the community that had no access? Why not allow all residents to experience this service that most consider to be a basic utility?

Due to the reliability and performance of the network, the network expanded

to all city indoor facilities—replacing the incumbent solution—with the intent to provide a seamless, high-quality and reliable Wi-Fi connection from the moment you land at the airport, to visiting downtown merchants, attending shows at the Convention Center, sight-seeing at City Hall, Community Centers, and all public facilities.

It began with the deployment of the school/community Wi-Fi network in East Side Union High School District (ESUHSD), where the city of San José partnered with SmartWave to construct an outdoor network that would broadcast Wi-Fi into the underserved neighborhoods. To keep cost down,

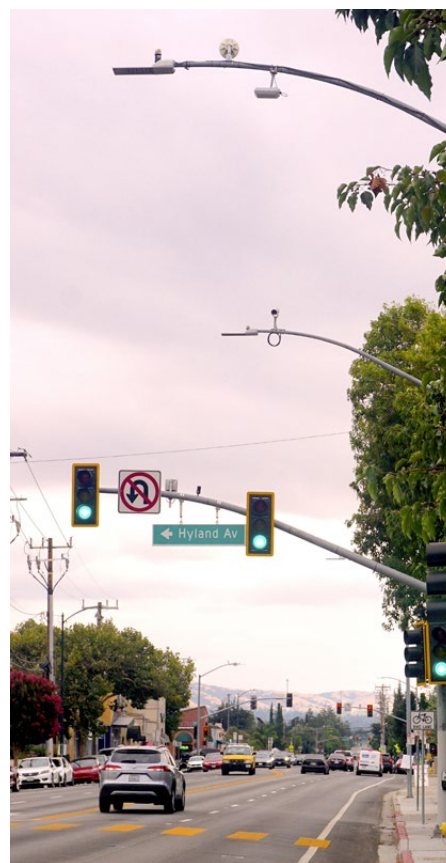
the city utilized streetlight poles, traffic lights and city building rooftops to hang outdoor access points (APs). This is when SmartWave decided on RUCKUS Networks to help build America's fastest public Wi-Fi. Now San José uses RUCKUS throughout city facilities for reliable connectivity.

After successfully deploying the Wi-Fi network at ESUHSD—providing free Wi-Fi to low-income neighborhoods—the city decided to extend the Wi-Fi downtown for businesses and common areas.

“To extend an internal Wi-Fi network into the surrounding neighborhoods requires tact,” said Walter Orell, EVP Engineering at SmartWave. “People think that a bad Wi-Fi experience can be fixed by just adding an additional access point, but that is not always the answer—and can actually make the problem worse if not handled properly. By adding hundreds of new APs outdoors that are surrounding existing indoor APs, you risk the possibility of co-channel interference. But, with the smart RUCKUS APs and our channel planning, we were able to do more with less, keep the costs down and deliver a better Wi-Fi experience. That’s why we chose RUCKUS.”

### Configure once, deploy everywhere

Adding RUCKUS® APs to an existing network does not require advanced network skills. Once connected to the network, the AP automatically locates the network controller, retrieves the correct software version and configuration files, and self-configures. Each outdoor AP relies on patented technology to transmit the strongest signals possible without impeding transmissions within the rest of the network.



“Every RUCKUS outdoor AP comes with BeamFlex+,” said Orell. “This innovative smart antenna technology dynamically adapts its directional antenna pattern to lock onto a client device signal without interfering with other signals or APs.”

In addition, RUCKUS APs leverage machine learning with ChannelFly®. This technology continuously evaluates channel performance in real time and uses the least-congested Wi-Fi channels to maximize throughput during peak time. SmartWave is also testing the use of RUCKUS AI—the network analytics, service assurance, and business intelligence software—to assist in their service-level agreement (SLA) management and troubleshooting. The implementation of RUCKUS AI has shown early signs of success in assisting in quality service assurance.

The products used in the city

deployment are:

- RUCKUS indoor and outdoor APs
- RUCKUS ICX® switches
- RUCKUS SmartZone™ controller deployed in the cloud for managing all APs and switches
- RUCKUS AI for SLA management, capacity planning, proactive incident detection and remediation, and service assurance

### Key benefits of RUCKUS implementation:

- Creation of city-wide Wi-Fi using fiber and outdoor APs
- BeamFlex+™ technology for strong, interference-free signals
- ChannelFly® technology for peak throughput during high usage times

- SmartMesh™ technology for wireless meshing and coverage expansion
- Extending the network to connect students and families to the internet—empowering communities and enhancing digital literacy

### Building an extended mesh network

To maximize Wi-Fi coverage and eliminate dead zones in hard-to-reach areas, RUCKUS APs can be meshed together wirelessly using RUCKUS SmartMesh™ rather than being physically connected through an Ethernet port.

“One of the reasons we selected RUCKUS APs was because they feature Smart Mesh,” said Orell. “This wireless meshing technology allows APs to communicate to each other and eliminates the need for Ethernet cabling. This dramatically speeds up our deployment time and prevents possible future weak links in the network.”

RUCKUS outdoor APs also come pre-packaged in a tough IP-67 weather-proof casing that houses an internal antenna. This also speeds up deployment, as no external antennas need to be attached or pointed in any particular direction. And it helps with zoning permits because these APs are less intrusive.

### Doing more with less

Built with four multi-user MIMO (MU-MIMO) spatial streams, these outdoor APs can support up to four times more concurrent users and cover a broader area than other legacy APs. This means you'll need to deploy and manage fewer RUCKUS APs compared to other APs. And when you need fewer APs, your deployment time is cut down as well.

According to Orell, the combination of the high-performance technology inside the APs as well as the installer-friendly deployment exterior was what made RUCKUS APs the ideal choice for the network. These APs provide cutting-edge

technology that wasn't available in any other product:

- BeamFlex+ adaptive antenna technology improves signal quality to connected device
- ChannelFly dynamic channel technology provides the highest signal throughput
- Weatherproofed to IP-67 standards—no external antenna needed
- Multi-user MIMO—supports up to 4X more concurrent users than other APs

Overall, adding RUCKUS indoor and outdoor APs to extend the city's network was a quick and painless solution.

### Deep dive into the origins of community Wi-Fi—ESUHSD

Phase one of the network expansion identified the neediest high schools and expanded that network into those neighborhoods. The ESUHSD network began with one high school attendance area in 2016 and was open only to ESUHSD students. With ESUHSD students being able to connect directly from their devices to the Wi-Fi using a school-provided service set identifier (SSID), students were able to do their schoolwork from home instead of going out to find free Wi-Fi. For students who could not afford internet devices, Chromebooks were made available from their school library.

After successful operation at the one attendance area, the city and the school added seven more high school attendance areas in the district, servicing only students. Post-deployment, based on the usage and client associations, the city discovered there were more users than students enrolled in the schools and realized that the broader community in the district was also in







Essential to the success of the city of San José Wi-Fi is the public/private partnership between them, RUCKUS Networks, and leading wireless integrator SmartWave Technologies. As a four-time Partner of the Year Award Winner with RUCKUS, SmartWave knew how to best deploy the RUCKUS solution for optimum capacity and coverage in a high-density public environment.

need of connectivity. This prompted the city to create a separate public SSID that the people from the communities could use to access the internet. The city also installed RUCKUS APs in downtown areas as well as more neighborhoods to extend the network.

The implementation of all seven areas in ESUHSD was completed and is serving over 360,000 households—breaking the barriers of the digital divide in East San José.

Currently, ESUHSD's new extended Wi-Fi network reaches about 75% of students in targeted neighborhoods with great success:

- Serving 360,000+ households in underserved neighborhoods
- Averaging download/upload speeds of at least 20/20 Mbps
- Unlimited data capacity with connections that are never throttled

Based on student self-reporting for these three high schools, one-third of students and their families connect solely through ESUHSD's network and use it for all of their internet needs, while another one-third use the network for some access. Not to mention,

many teachers also rely on the school's network at home.

To extend the network throughout the city, indoor and outdoor APs were deployed in and around schools, libraries and community centers that already offered broadband to the public. Overall, the city of San José deployed nearly 800 additional indoor and outdoor APs.

"The results are seen by looking at the data. We can see people are actually using the network. The value is evident in the terabytes of data consumed weekly, which is equivalent to the Library of Congress. The 60,000 users on the community Wi-Fi between the city and ESUHSD, and the kids being able to be in a safe environment able to learn remotely and do their homework," said Randy Phelps, ESUHSD's chief technology officer. "We're doing more than preparing these kids for tomorrow. In many cases, we're also helping their parents become more digital savvy, which increases their ability to become more successful in our community."

## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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