



Smart Wi-Fi for
TRANSPORTATION

Smarter Wi-Fi Handles the Traffic, Supports Operations

AND PROVIDES A PLATFORM FOR NEW SERVICES AND REVENUE

Faster, more dependable Wi-Fi connectivity that works even in a crowded station or terminal is critical to meet passenger and operational needs. It needs to support varying usage levels and RF environments throughout the day, be easy to deploy across large areas, support very high peak user density and require little or no ongoing IT staff support. Venues need to be able to use multiple WLANs for secure operational support as well as easy to use traveller connectivity.



Combining adaptive antenna technology, band steering, and airtime fairness makes Ruckus Smart Wi-Fi ideal for high-density transportation hub environments giving travelers and staff reliable high-speed wireless network access.



Patented smart antenna arrays in every access point provides longer range and more reliable Wi-Fi connections, requiring fewer APs than competitive alternatives.

Complete Coverage: Here, There, Everywhere

Transportation hubs are often very large facilities that require wireless connectivity everywhere, both inside and out. Getting reliable and complete Wi-Fi coverage across a facility can be expensive and time-consuming. The Ruckus ZoneFlex family of products uses patented BeamFlex™ technology that directs Wi-Fi signals toward each associated clients, picking the best performing signal path on a packet by packet basis and constantly mitigating interference to deliver the best possible Wi-Fi coverage. ZoneFlex delivers two to four times the coverage using fewer APs, costing less money and enabling faster deployment.

Largest Portfolio of AP Options

Ruckus offers the industry's widest range of APs, from small, single room indoor APs to 10 kilometer point to multipoint links, we've got a product custom designed for your needs. Typical transportation projects will benefit from our mid-range and high end indoor APs, the 7352 and 7982, as well as our outdoor 7782 and 7762 APs. The ZoneFlex 7441 AP is designed to deliver Wi-Fi over DAS systems, enabling a very cost-effective way to optimize coverage as well as meet certain railway and industrial application needs. The 7321-U SmartPoint AP supports 3G/4G backhaul options via a USB interface, enabling very fast and easy deployment to small, remote and/or temporary locations. In addition, SmartPoint can be used onboard trains and buses to offer mobile hotspot services.

Supporting Critical Applications

Nearly all transportation agencies are looking at new security and operational improvement applications, with IP video security being perhaps the most visible requirement. Ruckus Smart Wi-Fi was initially designed specifically to optimize and simplify wireless video transmission. In addition to great performance, it features heuristics-based traffic classification and prioritization that automatically recognizes voice and video traffic and applies the appropriate priority and queueing to ensure clear voice calls and flicker-free HD video.

- IP Video Security streams HD video to both a central monitoring station as well as on-premise security guards so they can pro-actively monitor a broader area and quickly assess issues even before getting to the scene. Video feeds can also be delivered to police and public safety authorities.
- Track/Station Video enables subway and train operators to see the status of upcoming tracks and stations to see potential hazards or obstructions in time to react. It can also provide views on cars so station personnel can identify and address any on-board issues.

- Digital Signage can provide travel schedules and route information, display advertising, public service broadcast announcements, and various local information to assist travelers.
- Data Collection with RFID and optical scanners can capture information such as ticketing data, freight status and asset location.
- Traveler/Guest Access for high speed internet. Provide easy to use visitor access supporting a variety of authentication/charging options, including free, credit card, one-time-password as well as authentication via an existing subscription with a mobile or fixed-line service provider.
- 3G/4G Offload enables seamless connections and authentication to move traffic off of overloaded cellular networks. Supporting protocols such as HotSpot 2.0/ Passpoint, transportation hub Wi-Fi can be a valuable extension to a mobile operator's network.



"At the end of the day, customers don't really care about how the infrastructure works — they simply want a fast, reliable and affordable Wi-Fi experience that's easy to access and use. That's precisely what we're delivering with Ruckus."

Nigel Wesley
Chief Executive Officer



Railway Certifications

Certifications by CENELEC subject Ruckus APs to shock and multiple forms of vibration, and measure characteristics such as supply surge, transients, radio frequency (RF) susceptibility, and RF emissions. Ruckus ZoneFlex™ 7982 indoor three-stream (3x3:3) 802.11n access point (AP) and Ruckus ZoneFlex 7782 3x3:3 dual-band outdoor AP Series meet the following test requirements for use by various U.S. railway systems in their commuter train and subway stations and platforms:

- **EN 61373:2010:** Railway applications – Rolling stock equipment – Shock and vibration
- **EN 50121-1:2006:** Railway applications – Electromagnetic compatibility – Part 1: General
- **EN 50121-4:2006:** Railway applications – Electromagnetic compatibility – Part 4: Emission and immunity of the signaling and telecommunications apparatus tests.

Meeting these test requirements means that Ruckus Smart Wi-Fi technology can now be deployed to enable high-performance wireless LANs (WLANs) trackside on railway systems nationwide, providing an exceptional user experience for data-hungry users of mobile devices such as smartphones and tablets. This is especially important for those who commute on a daily basis and demand Wi-Fi access both while on and off their trains.



Airport Wi-Fi

**MORE THAN 40 AIRPORTS
AROUND THE WORLD SELECT
RUCKUS WIRELESS**

Ruckus ZoneFlex Smart Wireless LAN (WLAN) system is widely deployed at many of the busiest airports around the globe looking to bring reliable, high-performance Wi-Fi connectivity to highly trafficked, high-density passenger terminals.

With thousands of business and leisure travelers carrying smartphones, tablet computers, and other mobile devices passing through airport terminals and guest lounges every day, airports are one of many public venues where the need for high-capacity, high-performance Wi-Fi connectivity has become an expected service.

China's two largest airports — Beijing Capital International Airport and Guangzhou Baiyun International Airport — have deployed Ruckus ZoneFlex to offer high-speed wireless networking guest access, as well as to support digital signage and other applications. Only Ruckus ZoneFlex APs were able to simultaneously connect 100+ mobile devices, including laptops, smart phones and tablets, reliably at any time. In addition, the compact, non-conspicuous design of the

ZoneFlex system and mounting options enabled them to be placed on walls, ceilings and poles, without affecting the integrity and aesthetics of the terminals. India's largest airport, Mumbai's Chhatrapati Shivaji International Airport (CSIA), has installed Ruckus ZoneFlex 7300 series 802.11n smart Wi-Fi access points throughout its international and domestic terminals and is initially offering free multimegabit Wi-Fi services to millions of passengers that transit the airport every year. CSIA operates five terminals over an operational area of 1,450 acres (5.9 km²) — handling over 29.1 million passengers and 670,235 tons of cargo in 2010.

Ruckus ZoneFlex systems are deployed at airports around the world, including major deployments in Austria, Brazil, China, Colombia, Cypress, India, Malaysia, Mexico, New Zealand, Philippines, Singapore and the United States.



Dealing with High Density

The critical test for Wi-Fi in a transport hub occurs at peak times, either rush hour or when there is a delayed train or plane that leaves lots of extra travelers looking for ways to make use of the time. Ruckus ZoneFlex™ provides a best-in-class solution for supporting a high-capacity of concurrent wireless users. BeamFlex technology provides higher performance that gets users on and off the Wi-Fi network quickly, increasing their usable capacity. Additional capabilities such as client load balancing, airtime fairness, band steering, and per user rate limiting ensure hundreds of users can be served by each access point while delivering reliable and fast Wi-Fi connectivity.



Transport facilities are choosing Ruckus Smart Wi-Fi solutions to solve challenges and raise the curve

PROBLEM	RUCKUS SMART WI-FI SOLUTION
High User Density	Ruckus BeamFlex antennas provide high performance connections that move traffic fast – freeing up more capacity
Hard to Reach Coverage Areas	High-gain smart antenna system extends Wi-Fi signals two to four times farther, requiring fewer APs and further reach
Unstable Wi-Fi Connectivity	Patented adaptive antenna technology within every Ruckus smart Wi-Fi access point ensures stable client connectivity and mitigates packet loss to ensure the highest performance possible
Limited Application Support	Provides up to 32 discrete WLAN networks that can be used to concurrently support IP-based video, voice, and administrative applications. Smart QoS automatically identifies traffic and assigns appropriate priority for voice, video and data traffic
Multiple Operators Need to Provide Service	Wi-Fi is ideally suited to act as a neutral host, so only one infrastructure needs to be deployed. From enabling unique SSIDs to supporting the HotSpot 2.0 user connectivity framework, Ruckus Wi-Fi fully supports shared infrastructure.
Guest Management	Intuitive, browser-based facility lets staff generate a unique and timed Wi-Fi guest pass in less than 60 seconds
Complex Installation and Management	Entire WLAN configures in minutes; APs self-configure by automatically discovering the controller. Ruckus Smart Wi-Fi systems can be remotely configured and managed



Waterloo Station



we're feeling the love
from a marquee list of
**WORLD-RENOWNED
CUSTOMERS**

Ruckus transforms commuting

Global Reach addresses massive coverage area, high capacity and diverse applications

Global Reach Technology, an innovative supplier of Wi-Fi, cloud and IP-based policy management services, provides access for millions of passengers along 27 miles of the Thames River, as well as onboard 24 Thames Clippers London River Ferries.

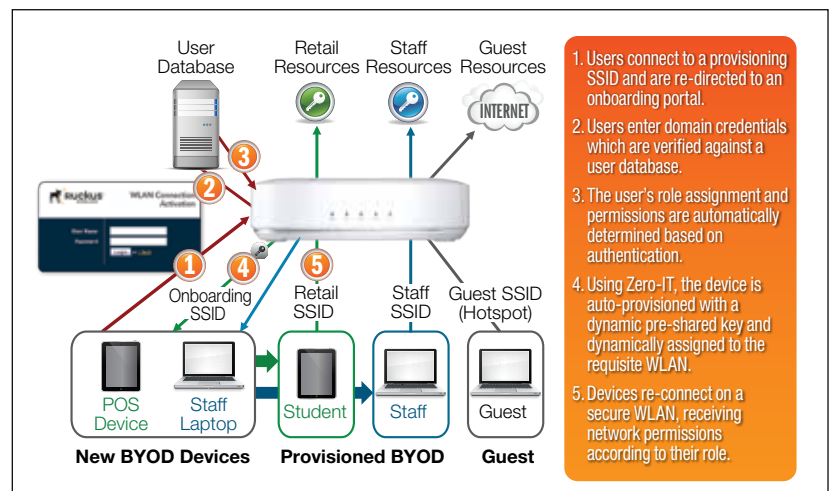
Global Reach's Smart Wi-Fi network is one of the world's largest outdoor mesh deployments, and serves a key transport artery weaving through the UK's capital. They needed a carrier-grade network that could not only support multiple public access services, but also enable a variety of real-time onboard applications. Global Reach used Ruckus ZoneFlex 7782-N, carrier-class 2.4/5 GHz 802.11n outdoor access points (APs) to deploy at main piers crisscrossing the Thames River, and ZoneFlex 7363 802.11n indoor dual-band APs onboard the river ferries, all centrally managed by ZoneDirector controllers at the Global Reach network operation centers.

In addition to offering its Thames Wi-Fi hot zone branded service, Global Reach is leveraging its high capacity infrastructure to offer wholesale and international roaming services across the 27 miles of river coverage. British Telecommunications plc (BT) gives public Wi-Fi access free of charge to all its BT Broadband subscribers via the white-labeled Global Reach service to the Thames River network, while the Transport for London (TFL) authority is using the Wi-Fi infrastructure for private services such as real-time location-based information, tracking boats, network monitoring, timetables, CCTV surveillance and other services.



Strong Wi-Fi Security, Simple to Administer

Transport authorities need strong security to separate operational and security usage from guest access. Now they have it. In addition to supporting standard 802.1X security for high security and operator-owned devices, Ruckus Wi-Fi infrastructure can provide simple, secure connections for multiple user types based on their authenticated roles and device types. While travelers can simply accept the end user license agreement or make a payment to get connected, other users such as maintenance staff or retail establishments may be placed into their own secure WLAN automatically using Ruckus BYOD capabilities.

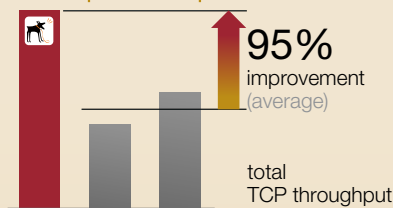


Ruckus Smart Wi-Fi delivers MORE CONSISTENT PERFORMANCE at longer distances

High Density: 90 active clients per AP

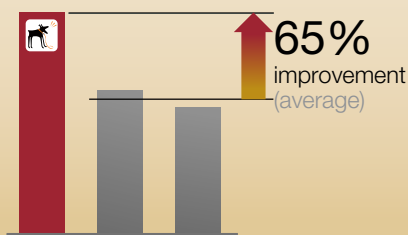
Source:

adaptive antennas + conventional Wi-Fi
learning-based SON implementations



SYRACUSE
S

Interference: 6 APs, 120 clients, 1 busy rogue AP



"Ruckus smart antenna technology is perfectly designed for our application. With Ruckus ZoneFlex, we didn't have to worry about AP placement because the APs handle what signal path is used and provide automatic and localized RF management. Without the Ruckus Wi-Fi system, we would be spending twice as much time and money deploying thousands of digital signs. These Smart Wi-Fi systems have helped us drive our business forward, reducing both capital and operational costs while speeding our ability to deploy digital signs in a timely manner."

Jianyu (Joe) Zhu

Technical Director, AirMedia

Deployed over 2,000 HD digital signage systems at 52 of China's largest airports.

AirMedia
航美传媒

No Ethernet? No Problem

Many transportation facilities have large areas beyond the public platforms and boarding areas. While these spaces may not have the same capacity needs, they can be a challenge for delivering wireless service since there is often no existing network infrastructure. Ruckus Smart Mesh networking allows network coverage to be extended simply by plugging additional APs into power outlets and backhauling their traffic via wireless links to a network-connected root node. This eliminates adding additional Ethernet cabling and can greatly simplify and reduce the cost of providing ubiquitous indoor and outdoor coverage.



Complete Portfolio for **TRANSPORTATION**

ZoneFlex 7982



Indoor dual-band, 3x3:3 802.11n AP with integrated smart antenna array and PoE (802.3af/at) support

ZoneFlex 7372



Indoor dual-band, two-port 802.11n AP with integrated smart antenna array and PoE (802.3af/at) support

ZoneFlex 7321-U



Indoor dual-band, 802.11n AP with integrated smart antenna array and 3G/LTE USB backhaul

ZoneFlex 7782



Outdoor dual-band, 3x3:3 802.11n AP with integrated smart antenna array and PoE (802.3at/af) support

ZoneFlex 7762



Outdoor dual-band, two-port 802.11n AP with integrated smart antenna array and PoE (802.3at/af) support

ZoneFlex 7731



Outdoor long-range, point-to-point/multipoint 802.11n 5 GHz bridge

ZoneFlex 7741



Dual-band access point for DAS in-building coverage

ZoneDirector Controllers



Central wireless LAN controllers supporting from 6 to 1,000 Ruckus APs

FlexMaster



Linux-based remote Wi-Fi system management software



Smart Wi-Fi

Designed and Built for **Pervasive Performance...**

Available from **Ruckus Wireless**

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