



Tsunami[®] Series Video Surveillance



Performance Matters. Proxim Delivers.



Agenda

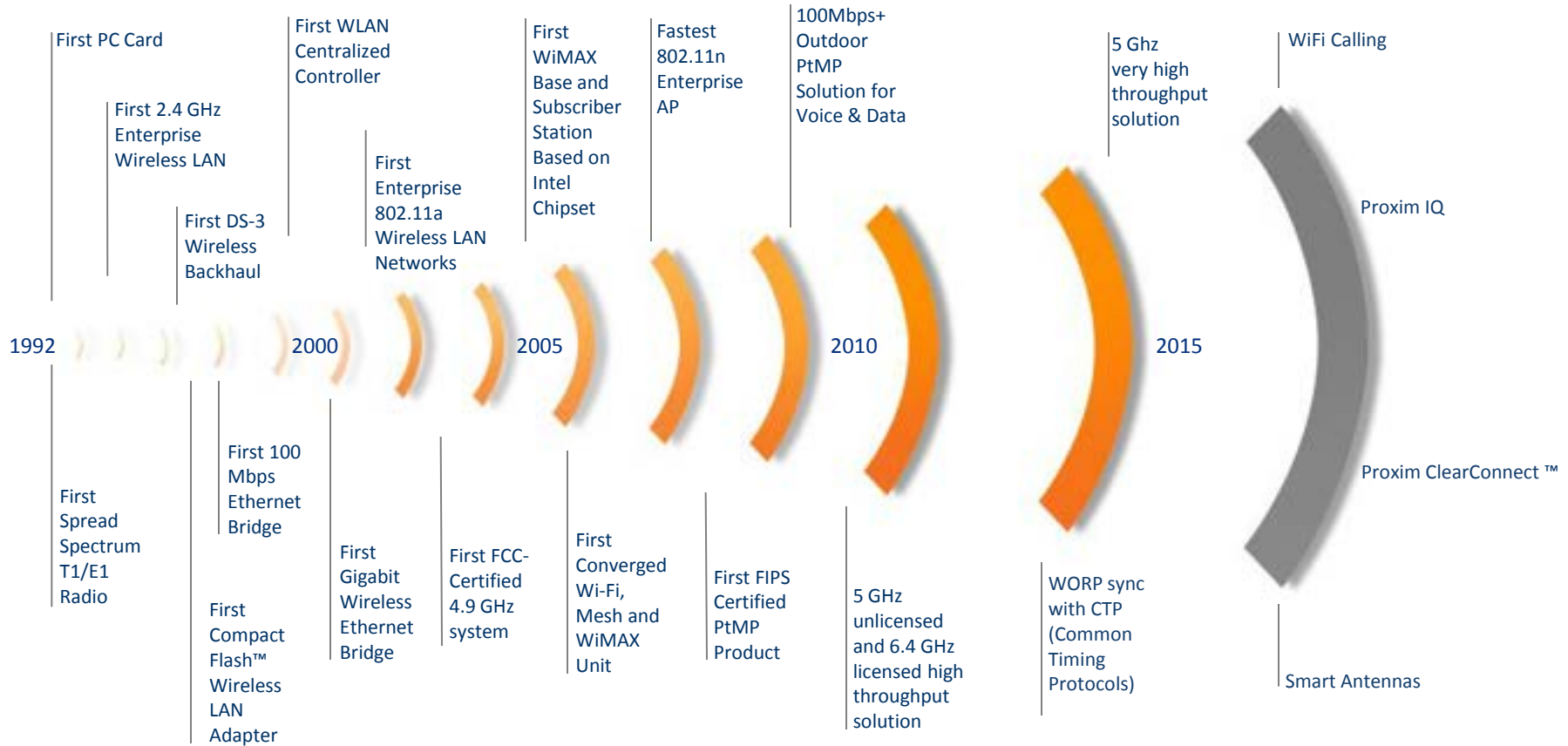
- Technologies and Tools
- Tsunami Product Portfolio
- Tsunami Applications
- ProximVision Advanced – Hybrid Controller
- Summary



Technologies and Tools

A person is working on a laptop. The screen displays a map with various locations marked by yellow labels. To the left of the map is a list of text, possibly a directory or a list of items. Below the map is a green bar with some text. The person's hands are visible, typing on the keyboard. On the desk next to the laptop is a smartphone and a calculator.

Innovation at the Heart of Proxim



More Net Bandwidth

Solves the hidden node problem, protects the system from packet collisions and transmits the data in an optimal way

Over 75% efficient means more \$\$ bits

Quality of Service

Ensures that the most important data arrives with priority. Prioritize and allocate bandwidth based on the type of traffic. Built in support for VoIP, IPTV, streaming video and more.

More Concurrent Subscribers

Connects over 100 remote nodes without adverse effects on total usable bandwidth

Smart Scheduling

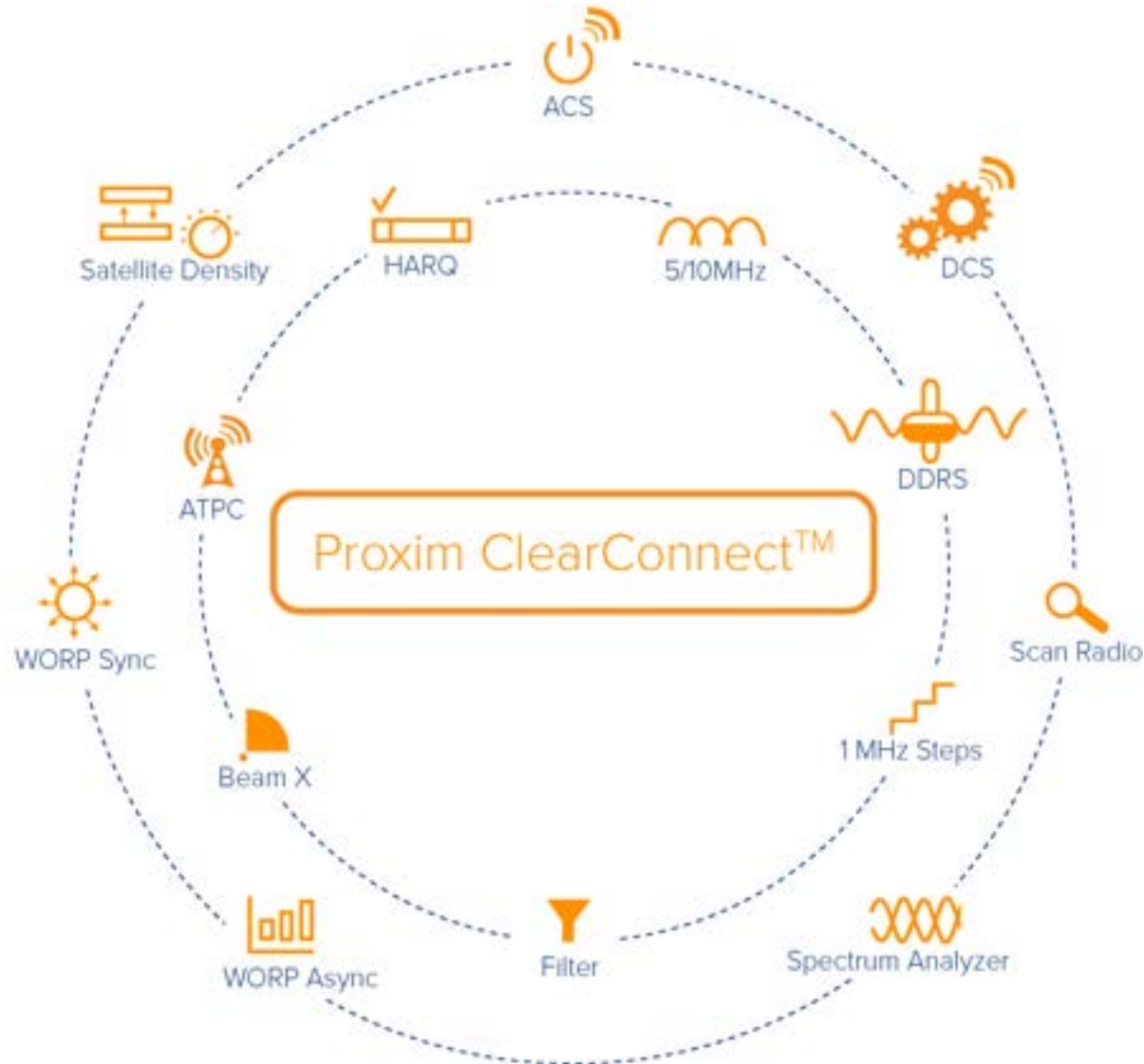
Controls network bandwidth, protect the network from excessive bandwidth use by any one station



W O R P®
WIRELESS OUTDOOR ROUTER PROTOCOL



WORP® is a proprietary wireless MAC protocol which optimizes connectivity in PMP networks



Proxim ClearConnect™ ensures your wireless network efficiency even in harsh environment



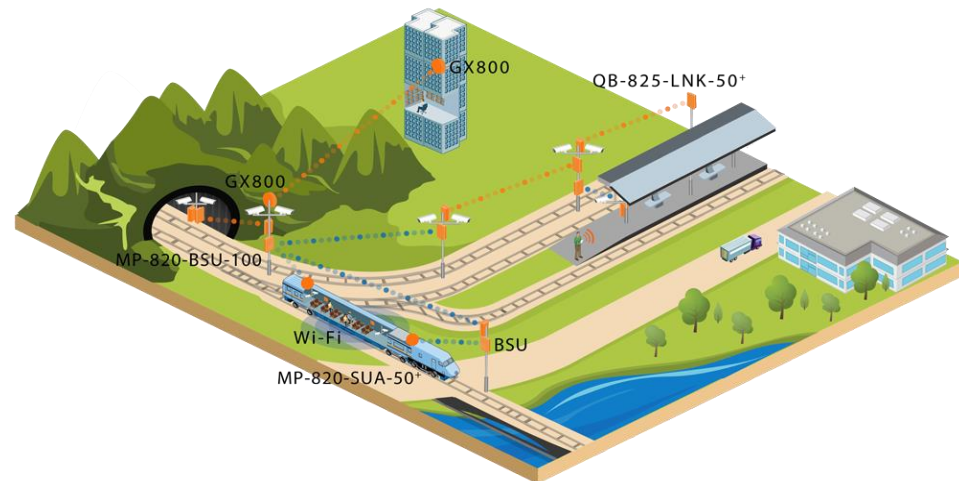
Features

- Guarantees seamless mobility
- Unparalleled handoff times < 40msec
- Supports delay-sensitive multimedia applications at speeds of 285 km/h (196 mph)

Applications

- Onboard Internet Connectivity
- HD CCTV inside vehicles
- Passenger Announcement (PA) Systems
- Onboard display advertising
- Digital Signage to provide route information

- All Tsunami Products Support High Speed Mobility
 - Tsunami series high speed roaming enables seamless communication between on board unit and road side equipment
 - Up to 295 km/h (185 mph)
 - Clients roam between Tsunami 820, 8200, 8100 or 10100 base stations
- Tsunami MP-820-SUA and MP-825-SUR are ideal for in vehicle installation – Buses, trains, cars, ferries
 - Compact and robust housing that easily fit in the vehicle trunk
 - 48 VDC powering via Ethernet port or 12 VDC powering via serial port
 - Choice between integrated wide angle antenna (SUR) or roof top antenna (SUA)



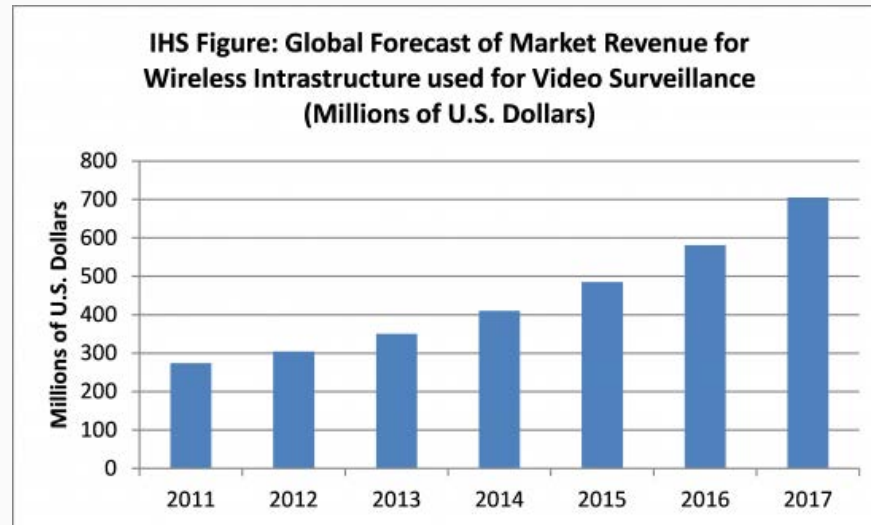


Tsunami[®] Video Surveillance Applications



Market Trends

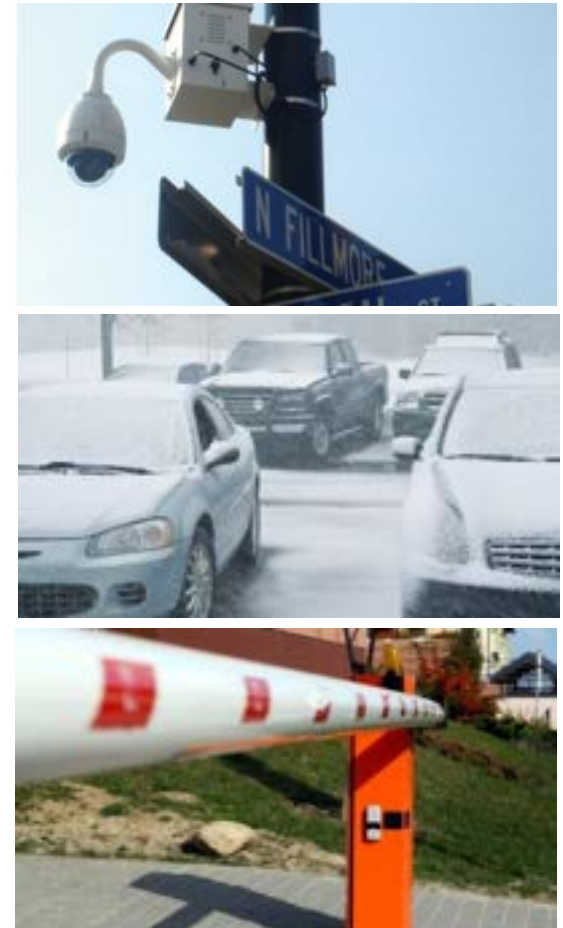
IMS Research has predicted that wireless video surveillance deployments will double by 2017 globally; 17 % CAGR through 2017



“For those who want to establish surveillance solution, low cost solutions will be a great find. So, wireless video surveillance equipment takes away the need to establish trenching cables and thus leads to cost effective solutions,” Josh Woodhouse, Video Surveillance Analyst at IHS.

Challenges for High Quality Video Surveillance

- Excellent surveillance quality that ensures image usability in challenging conditions
 - High Capacity Transmission Medium Available
 - Reliable Video Communications
 - Water- and dust-proof (IP66-rated)
 - Wide operating temperature range -40 °C to 55 °C
 - Complex and constantly changing lighting
 - Complex picture composition, backlighting
 - Large area overview
 - High level of detail needed
 - Vibration
 - Clear images of rapidly moving objects and persons



- ✧ Video Traffic is Unique
 - Requires high throughput in the Uplink
 - Requires high bit rate, low latency/jitter
- ✧ Many applications have cameras on moving platforms – bus, train, tram
 - Proxim supports Mobility
 - Proxim Products - 8200, 820, 10100

Requirements	Proxim Delivers
High Capacity Transmission Medium Available	240Mbps Capacity per BSU
Reliable Video Communications	ARQ, QoS ensure every packet is delivered
Water- and dust-proof (IP66-rated)	All Outdoor Products are IP67
Wide operating temperature range -40 °C to 55 °C	Proxim supports -40 °C to 60 °C

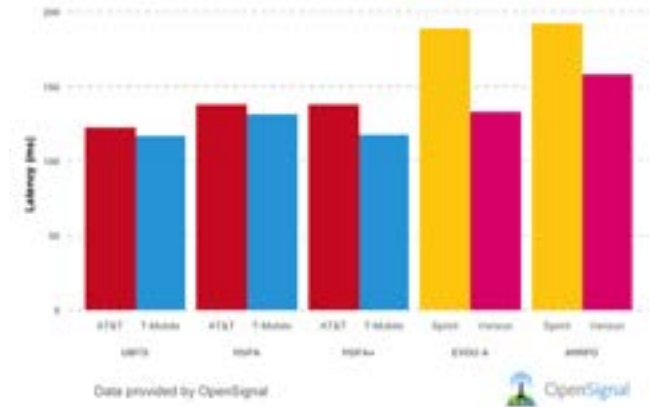
Tsunami - Security and Surveillance

- Tsunami 10100/8200/820 series robustness secure sensitive data
 - Metal enclosure with secure management and AES data encryption
 - Optimized RF link thanks to Dynamic Frequency Selection, Dynamic Data Rate Selection and Base station redundancy
- Tsunami 10100/8200/820 series features enhance video stream
 - Multicast transmission at high modulation and IGMP snooping
 - QoS with latency and jitter control
 - Packet burst and advance retransmission mechanism
- Tsunami 820/8200/10100 series are designed for HD cameras
 - 50, 100, 220 or 650 Mbps throughput
- Tsunami 820 series compactness is ideal for urban deployment
 - Blend into street equipment with it's small size



Mobility Off Load - Challenges

- Increasing demand for off loading high bandwidth applications from mobile platforms
 - WiFi commonly offered on trains and buses
 - Video Surveillance being bundled with WiFi
- Options for Off Load
 - WiFi Mesh
 - Not designed for application seamless handover
 - Suffers from hidden node issues
 - Unable to maintain necessary QoS for multiple applications such as video
 - Cellular such as 3G/4G
 - 3G lacks the capacity and latency support required
 - 4G monthly bills from the carrier can exceed \$1000
 - 2Mbps for standard def video*43k minutes/month =86Gb of data per camera per month
 - HD video operates at ~ 10Mbps



Case Studies



➤ Opportunity

- Spread over 2300 hectares, Dubai Investments Park required a high-speed, cost-effective network to enable video security for intrusion detection and monitoring purposes.

➤ Solution

- 40 HD closed-circuit television (CCTV) cameras
- 6 fixed ALPR cameras
 - Automatic License Plate Recognition
- Proxim Tsunami MP-8200 solution installed across the residential zone of the park
 - Aggregating live feed to a central monitoring station

➤ Result

- covers over 25% of the entire park area
 - About 15 days to perform the whole installation



Allentown, PA – USA Citywide Surveillance Network

➤ Opportunity

- Part of the city's re-vitalization project, Allentown, PA - USA is deploying security cameras to:
 - Capture license plates at significant distances at night
 - Monitor critical locations around the clock.
- The use of high definition PTZ cameras requires 4 Mbps of continuous bandwidth per camera.

➤ Solution

- Local integrator: Communication Systems inc (CSi)
- More than 300 Sony cameras
 - 175 of which are connected using wireless
- Tsunami® 8200/820 and old MP.11 series radios

➤ Result

- The citywide surveillance network helps reduce crime by 20%



Securing Statue of Liberty, NY - USA

➤ Opportunity

- Part of the renovation following the devastation caused by Hurricane Sandy, the Statue surveillance and security system needs to migrate from analog CCTV to the latest in digital video technology

➤ Solution

- Total Recall corp. put in place a “Dream Team”
 - Proxim Wireless Tsunami 8200/820 BWA radios
 - DragonWave microwave radios
 - Axis communications IP cameras with HDTV quality (160 cameras)
 - Scallop Imaging solid-state M6-200 IP cameras with six megapixel, extreme low-light video and undistorted panoramic 200° FOV.
 - BriefCam Video Synopsis quick review software
 - Milestone Systems open platform IP video management software
 - Pivot3: Reliable digital storage and computer devices
 - RGB Spectrum massive video wall
 - Winsted Corporation ergonomically designed consoles

➤ Result

- Enable the park to cover areas with high-quality video surveillance that they could not reach before



Tenerife Tram System, Spain

➤ Opportunity

- Provide complete CCTV Coverage at speeds up to 100Km/h along 80Km of winding track which goes through the city and through tunnels

➤ Solution

- Proxim Tsunami MP.11 Model 5054 BSUs were deployed along the track in the proper locations and multiple 5054-SU's were deployed in the train to backhaul each camera and provide 4Mbps of continuous connectivity

➤ Result

- The Tenerife Tram Surveillance Solution team was able to effortlessly and quickly deploy the surveillance cameras
- Proxim's wireless solutions cost-effectively delivered connectivity along the track and within the tram



Metro Ligero Oeste line in Madrid, Spain

➤ Opportunity

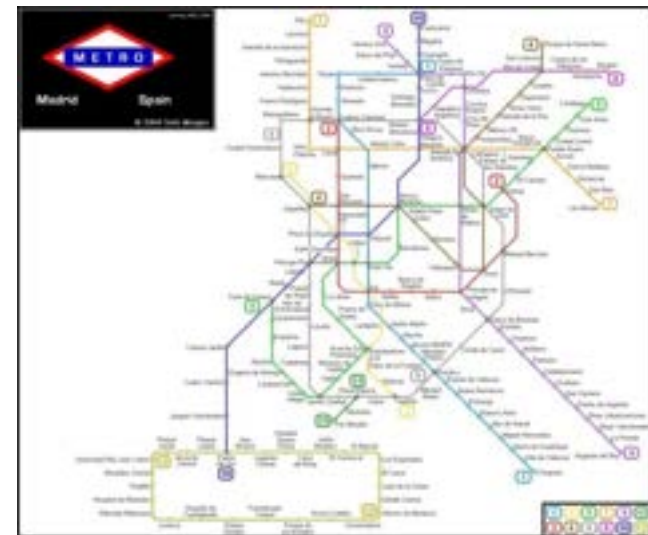
- Provide complete CCTV Coverage and Wi-Fi access at speeds up to 70Km/h along 22.2Km of winding track
- Services include CCTV, Ticketing, and free Wi-Fi for 40,000 daily passengers in stations and on-board

➤ Solution

- 81 Tsunami MP.11 BSUs along the track
- Tsunami MP.11 SU in the train
- CCTV 2Mbps H.264 cameras
 - 6 per train

➤ Result

- Continuous connectivity maintained throughout the entire line
 - including maintaining video quality inside tunnels.
- Provide up to 15Mbps of Wi-Fi access when video is not being viewed live
 - 567 sessions per day
 - 13 minutes connected on average
 - 7 Meg traffic per session



San Francisco, CA – USA

Transit Signal Priority System

➤ Opportunity

- Improve San Francisco municipal bus commute times
- Leverage infrastructure to gain remote Live View and DVR communication to over 1000 Buses.

➤ Solution

- 1000 x Tsunami MP-8200 are deployed on 600 intersections throughout San Francisco providing a communication infrastructure for Transit Signal Priority and backhauling CCTV cameras at fixed locations.
- Buses upgraded to support MP820 radios with custom designed Multi-polarized mobile antennas in high interference environments.

➤ Results

- Commute times improved by 10-20%
- provide remote Live view over 30km of Bus routes, allowing Command center response to live video in case of emergency services and Bus auditing and tracking.



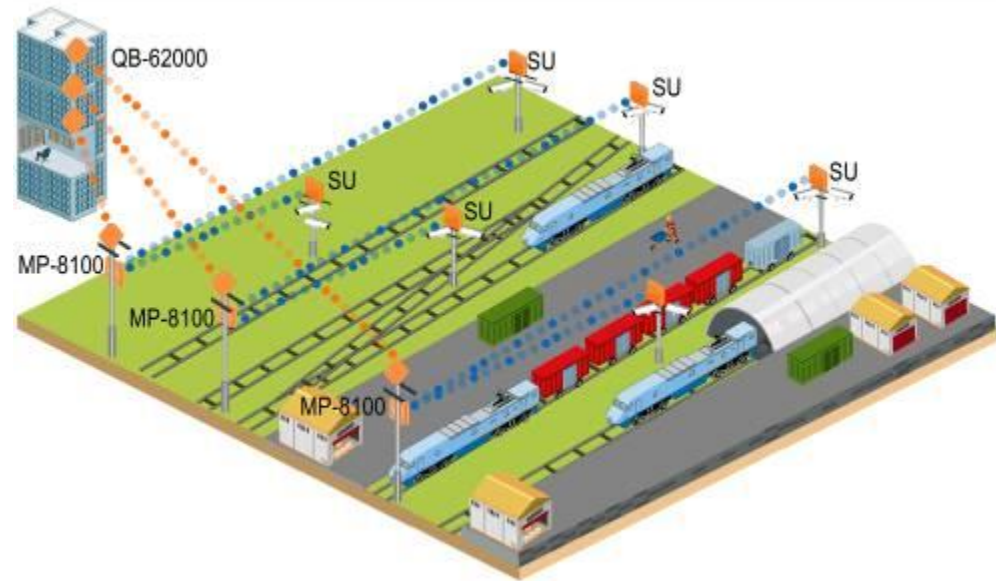
NYCT MTA Coney Island and Amtrak Long Beach

➤ Problem

- Secure the Rail Yard in Coney Island with High Definition Cameras

➤ Solution

- Tsunami Multipoint Subscriber Units connect IP cameras to Multipoint Base Stations
- 60GHz Backhauls multiple Base Stations back to the NOC
- Constant, reliable surveillance that can survive harsh outdoor environments
- Cost and time savings vs. fiber, designed for outdoors



✧ Challenges

- The City of Vancouver needed to deploy additional video surveillance cameras to help monitor and secure the millions of Olympic visitor; In many areas of the city, fiber connectivity for the cameras was not an option due to cost and time

✧ Solution

- >100 Tsunami units deployed, using 60GHz Backhauls aggregating multiple Base Stations back to the NOC
- The City was able to extend the situational awareness network while staying within budget, since Proxim's wireless connectivity solutions cost a fraction of wired solution
- The City of Vancouver continues to use this system today to enhance security within the city



<http://us.sourcesecurity.com/security-videos/city-of-vancouver-utilises-proxim-for-wireless-video-surveillance-at-2010-winter-olympics.html>

FIFA World Cup – South Africa

➤ Solution

- Proxim Wireless is a major contributor to high-profile sports events.
- Security and Surveillance was a high priority at the World Cup requiring >450 Quickbridge PTP links providing supplemental coverage to the Fiber network.
- Our solution was also used for Hotspot access and Traffic Management.



Security and Surveillance: NYPD



Solution

- 3000+ Radio's deployed throughout NYC's 5 boroughs backhauling CCTV Camera's using 4.9, 5.3, 5.4 and 5.8GHz
- The deployment started in 2006 and continues to grow to support the City's needs.



British Columbia Ferries, Canada

➤ Opportunity

- Provide Mobile Internet Access to customers and employees to support:

- VoIP
- Video
- Internet and email

- Support routes exceeding 20 miles

➤ Solution

- Tsunami MP.11 & MP-8200 with mobility
- More than 100 radios deployed.

➤ Result

- Long Distance Radios exceeding 10 miles
- Support for seamless mobility
- Rapid deployment
- High Throughput.





Tsunami® Product Portfolio

Point-to-MultiPoint

**Tsunami®
MP-820/830
Series**



**Tsunami®
MP-826/8160
Series**
(Not FCC or ETSI
certified)



**Tsunami® MP-8200
Series**



Tsunami® XP-10100 Series

**Tsunami®
MP-10100 Series**



Point-to-Point

**Tsunami®
QB-825/835
Series**



**Tsunami®
QB-8200 Series**



**Tsunami®
QB-10100 Series**



**Tsunami®
GX-810
(FCC only)**



Wireless LAN

**ORiNOCO®
AP-8100**



**ORiNOCO®
AP-9100**



**ORiNOCO®
QB-9100**

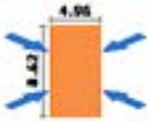


**ORiNOCO®
AP-9100R**



**ORiNOCO®
USB-9100**





Compact Form Factor

Small form factor helps WISP or video surveillance deployments in urban environments



Easy to Install

Wide angle (30°) antenna to quickly pick up Base Station signal associated with LED indicator to finalize alignment for optimum performance



High Speed Mobility

Seamlessly roams between Base Stations at speed up to 185mph (295km/h)



Backward Compatible

Tsunami® MP-820/830 series is fully compatible with Tsunami® MP-8100 and MP-8200 series. It can also interoperate with Tsunami® MP.11 5054



Robust and Secure

IP67 aluminum enclosure ensures operation in extreme environments while AES and secure management protect data traffic



High Tx power for a better range

Tsunami® 820/830 features high power radio capable of 26 dBm Tx power for extended coverage



Pay as you Grow

License based performance providing throughput evolution from 10 to 25 Mbps (830 series) or from 50 to 100 Mbps (820 series)



Centralized Management

ProximVision NMS centralized network management system provides rapid network deployment and mobile configuration





World-class Performance

With up to 300 Mbps data rates, the Tsunami® 8200 delivers superior wireless performance



Flexible Channel Planning Worldwide

Supports licensed and unlicensed frequencies and Dynamic Frequency Selection in 4.9 - 5.9GHz band



High Speed Mobility

Allows Satellites to seamlessly roam between Base stations at speed up to 185 mph (295 km/h).



Water Proof

IP67 rated and tested to operate under 1 meter of water for up to 30 minutes.



Dual Gigabit Ethernet Ports

Dual Gigabit Ethernet ports with PoE in/out, capable of powering 802.3af compliant devices.



Advanced Security

Implements tiered security layers for the most secure outdoor wireless communications



Extended Coverage

The MP-8200 features high power radio capable of 25.8 dBm Tx power for extended coverage



Centralized Management

ProximVision NMS centralized network management system provides rapid network deployment and mobile configuration





Very High Performance

With up to 633 Mbps UDP Throughput and 29 dBm transmit power, Tsunami® 10100 delivers very high throughput over very long range.



Interference Robustness

Proxim ClearConnect™ suite of over 13 different techniques all working together ensures robust and reliable radio communications in noisy deployments.



Flexible Channel Planning Worldwide

Operates in unlicensed bands from 5.150 to 5.925 GHz with 20, 40 and 80 MHz possible channel bandwidth.



Water Proof

IP67 rated and tested to operate under 1 meter of water for up to 30 minutes



Advanced Gigabit Ethernet Ports

Dual Gigabit Ethernet ports with controllable PoE in/out, capable of powering 802.3af compliant devices. Includes support for Jumbo Frame (9k bytes) and Ethernet Synchronisation pass-through (IEEE 1588v2).



Extra Secure

Tsunami® 10100 Implements AES 128 encryption and Radius authentication. It also features highly-secure remote management via SSL, SSH and SNMPv3.



Cost Effective and Ease of Use

The most cost-effective, very high performance solution from Proxim, enabling any deployment to enjoy a quick return on investment.



Controlled and Managed Effortlessly

ProximVision™ Advanced unifies management of the entire Proxim infrastructure, within a few clicks. From monitoring network performance to remote device configuration and management PV Advanced provides total control.





Dual radios
Dual protocols

Tsunami CrossPoint (XP) includes two radios:
-one 5 GHz WOPR multipoint radio
-one 2.4 GHz Wi-Fi access point in a single device



Very High
Performance

With up to 633 Mbps UDP Throughput and 29 dBm transmit power, Tsunami® XP-10100 delivers very high throughput over very long range.



Interference
Immune

Proxim ClearConnect™ suite of over 13 different techniques all working together ensures robust and reliable radio communications in noisy deployments.



Part of Tsunami®
Family

Tsunami® XP-10100 is fully interoperable with Tsunami® MP-10100 series. Moreover it is as robust and feature-rich as any other Tsunami® 10100 device



Advanced Gigabit
Ethernet Ports

Dual Gigabit Ethernet ports with controllable PoE in/out, to power 802.3af compliant devices. Includes support for Jumbo Frame (9k bytes).



Extra Secure

Implements AES 128 encryption and Radius authentication. Also features highly-secure remote management via SSL/TLS, SSH and SNMPv3.



Cost Effective
and Ease of Use

The most cost-effective, very high performance access point with backhaul solution from Proxim, enabling any deployment to enjoy a quick return on investment.



Controlled and Managed
Effortlessly

ProximVision™ Advanced unifies management of the entire Proxim infrastructure, within a few clicks. From monitoring network performance to remote device configuration and management PV Advanced provides total control.



➤ Product Variants

➤ XP-10100-BSU and XP-10100-SUA (Cross Point)

- Two N-Type connectors : 5.150 – 5.925 GHz
- Two N-Type connectors: 2.4 GHz

➤ Features

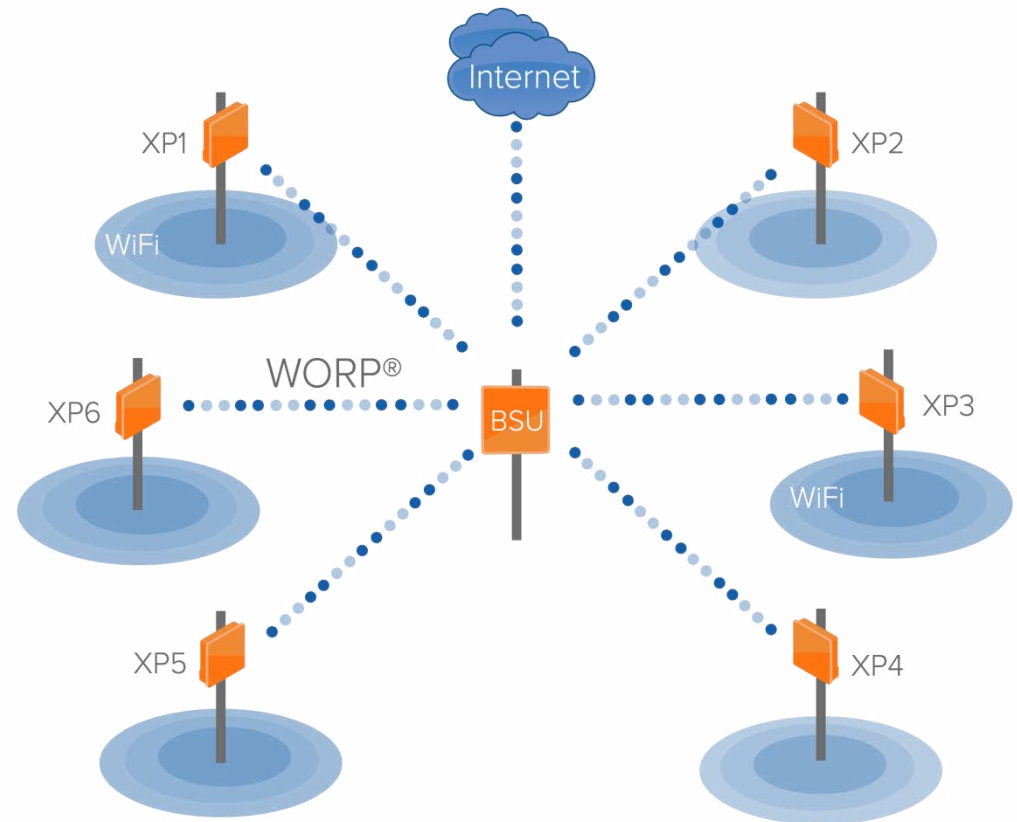
	2.4 GHz	5 GHz
Protocol	WiFi	WORP
MIMO	2x2:2	2x2:2
TX power (dual chain)	Up to 26dBm	Up to 29 dBm
Data Rate	300 Mbps	866 Mbps
Throughput	Up to 150 Mbps	Up to 600 Mbps



- Dual Gigabit ethernet port with PoE in and out
- Jumbo Frame support (9k Bytes)
- Precision Time Protocol (IEEE 1588v2) pass-through
- Controller communication
- HotSpot

➤ PTMP WiFi Backhaul

- Each XP unit has dual radios – one for WORP communication to the BSU and one for standard 802.11 access
- XP also supports the PoE out for applications such as video cameras.
- This allows rapid deployment of a WiFi access network as well as and security coverage on one network



➤ ORiNOCO® Quickbridge® :

- Outdoor ORiNOCO Access Point with integrated Quickbridge Point to Point Backhaul
 - Local End Point (Backhaul only)
 - Remote Cross Point (Access Point plus Backhaul)

➤ Product Variants

➤ QB-9100

- QB-9100A (local) - 2xN-Type: 5.150 – 5.925 GHz
- QB-9100B (remote) - 2xN-Type: 2.4 GHz
- 2xN-Type : 5.150 – 5.925 GHz

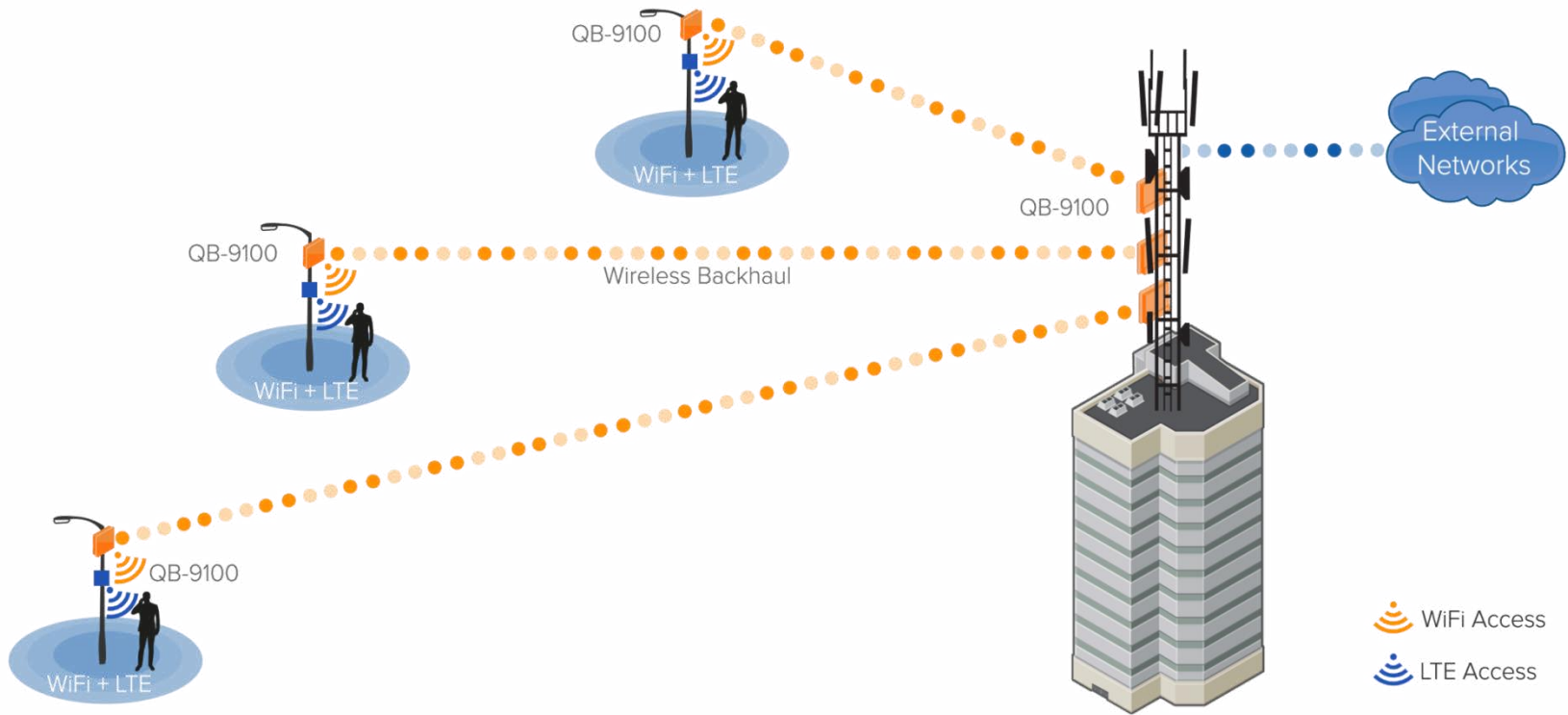
➤ QB-9150

- QB-9150A (local) - 22 dBi integrated antenna: 5.150 – 5.925 GHz
- QB-9150B (remote) - 2xN-Type: 2.4 GHz
- 22 dBi integrated antenna: 5.150 – 5.925 GHz

➤ Additional Features

- Dual Gigabit Ethernet port with PoE in and out
- Jumbo Frame support (9k Bytes)
- Ethernet sync (IEEE 1588v2)
- Hotspot 1.0





- The first wireless solution that combines an 11n 2.4 GHz Access Point and 5 GHz Backhaul.
- 9100 supports PoE out to provide power for applications such as LTE radios, cameras etc
- This allows rapid deployment of a backhaul solution for small cell LTE networks or surveillance networks, with the additional benefit of providing WiFi Hot Spot access in the same box.



ProximVision Advanced

Hybrid Controller

- PV Advanced merges Cloud Based Carrier Management System and WLAN Controller features into a single software platform
- Today's networks are becoming more complex to address customers need for high capacity and mobility.
 - This involves multiple Wireless technologies such as Wi-Fi, Proxim's WORM® technology or licensed microwave.
 - Running these complex heterogeneous RANs with multiple frequencies, power levels, and applications demands a solution that until today was a mixture of several disparate systems (such as NMS and WLAN controllers).
- PV Advanced allows Proxim network element to be managed under a single system ensuring seamless integration and control.



"With ProximVision Advanced, Proxim redefines the NMS/WLAN controller landscape with a hybrid solution today to deliver what our customers need for tomorrow. ProximVision Advanced has been architected to lead the way in simplifying, cost reducing, and easing operational challenges for the highly complex Heterogeneous Networks being deployed."

Greg Marzullo, President and CEO, Proxim Wireless



Designed for Large Networks

PV Advanced includes redundancy and NorthBound Interface to efficiently manage up to 10 000 nodes networks



Control and Manage Effortlessly

From monitoring network performance to remote device configuration and management, PV Advanced provides total control in a few clicks



Geographical View and Dashboard

Provides a map overlay of your entire network with real-time, visual network status indicators



Fault Management

Monitors your network and informs you of operational events or alarms.



Heterogeneous Networks

PV Advanced unifies management of the entire Proxim infrastructure, including basic supervision of SNMP capable switches and routers.



Multiple Remote Access

Gives network managers a flexibility to define access policy from the office or through the cloud for up to fifty concurrent session.



Great Ease of Use and Supportability

Allows you to manage your entire network from a single console and wherever you are located



FREE Copy

Download a full features, 100 nodes, FREE version of PV Advanced for 30 days



PV Advanced includes basic controller features

- Auto discovery
- Network overview
- Firmware management
- Easy configuration
- RF parameters manual settings

- PV Advanced is designed to support large networks
 - Up to 10 000 nodes
 - Up to 50 concurrent management sessions
 - Auto log out after pre-defined inactivity time
- PV Advanced is ready for heterogeneous networks
 - Support for all Proxim Tsunami® and ORiNOCO® devices
 - Includes 10 years old “Legacy” product
 - Basic Support for any SNMP MIB-2 capable product
 - Product status and real time performance information
- PV Advanced software works on Windows 2003, 2008 or 2012 Server
 - It can run on local hardware, virtual machine or in the cloud
 - Server performance depend on the network size

Network Elements	CPU	MEMORY	Disk
<1,000	Intel® Xeon® E3-1220 v3	4 to 8 GB	500 to 1000 GB single partition
<5,000	Intel® Xeon® E5-2430 v2	8GB	1000 GB single partition
<10,000	Intel® Xeon® E5-2660 v3 or E5-2680 V3	16 GB	2000 GB single partition

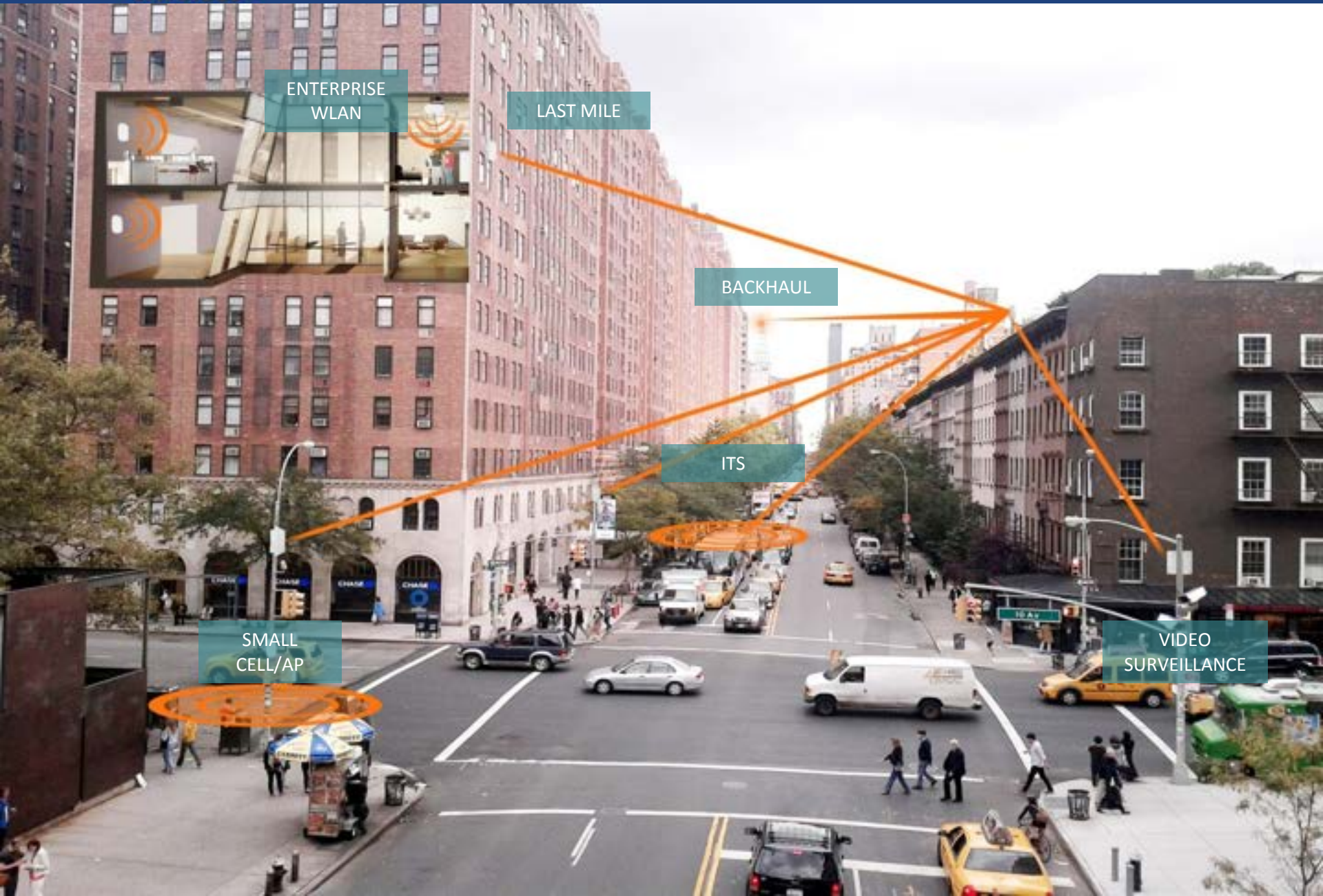


Tsunami® Unique Selling Points

- WORP® and WOPR® sync – QoS for all traffic, especially video
- Proxim ClearConnect™
- Proxim FastConnect - Seamless Application Mobility
- High frequency and bandwidth efficiency
- High Capacity – Up to 600Mbps
- IP 67 hardware on all products and -40 to 60 degree C support
- Low power consumption
- Frequency range - 5 and 6.4GHz
- Free software updates with enhanced features
- ProximVision™ Advanced for all Proxim products
- Frost and Sullivan award

Tsunami®
Performance Matters, Proxim Delivers™





Thank You

 Proxim Wireless

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