WAViON
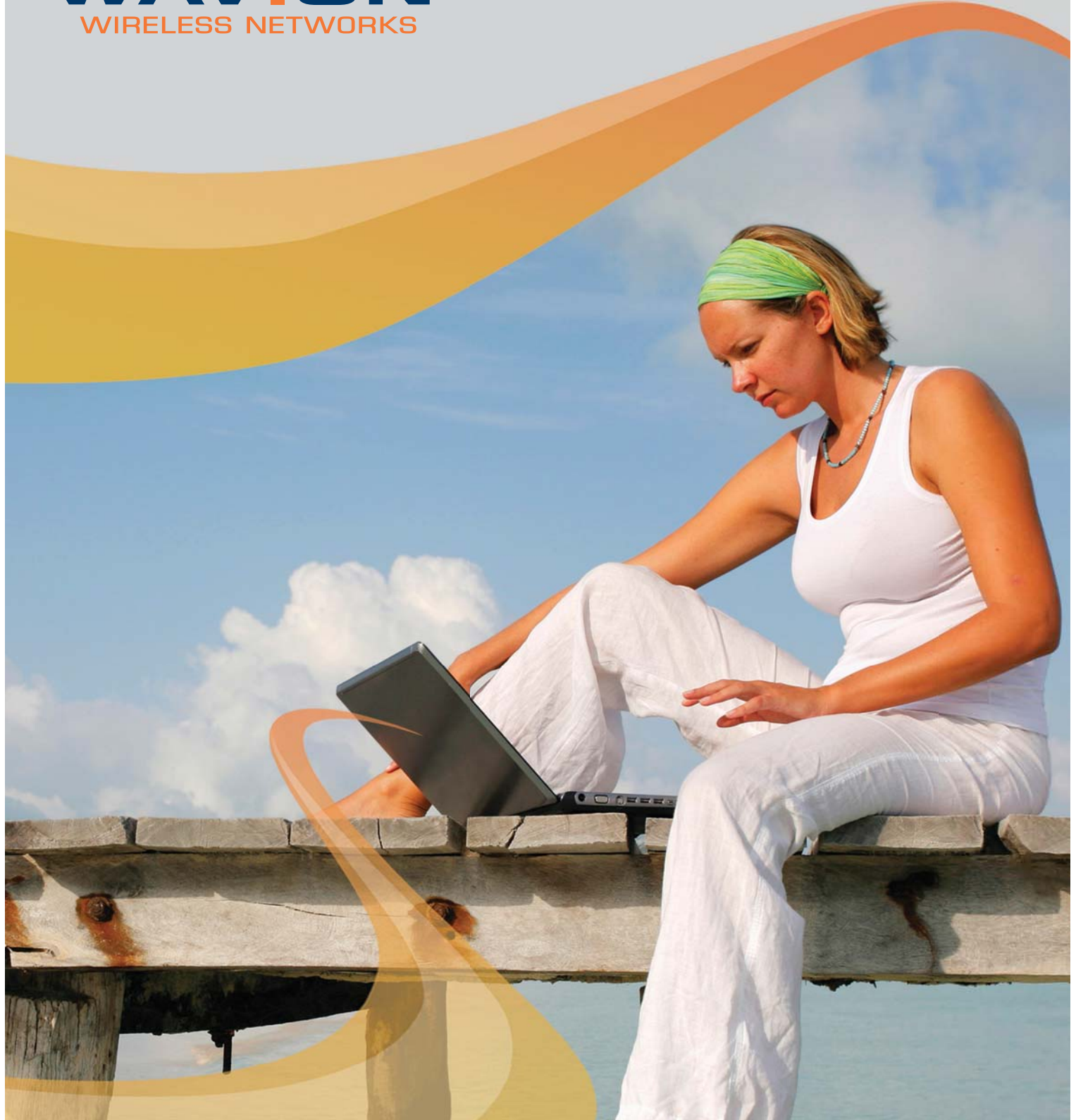## WIRELESS NETWORKS

As far as Wi-Fi can go

Wavion Beamforming

Wavion's spatially adaptive beamforming technology focuses the energy to and from the wireless client, on a per-packet basis. This process significantly increases the link gain and the interference resiliency of the base station. Moreover, while conventional Wi-Fi technology suffers from the destructive effect of multipath propagation, Wavion's beamforming technology exploits multipath to its advantage by coherently combining the signals along the different propagation paths to the client.
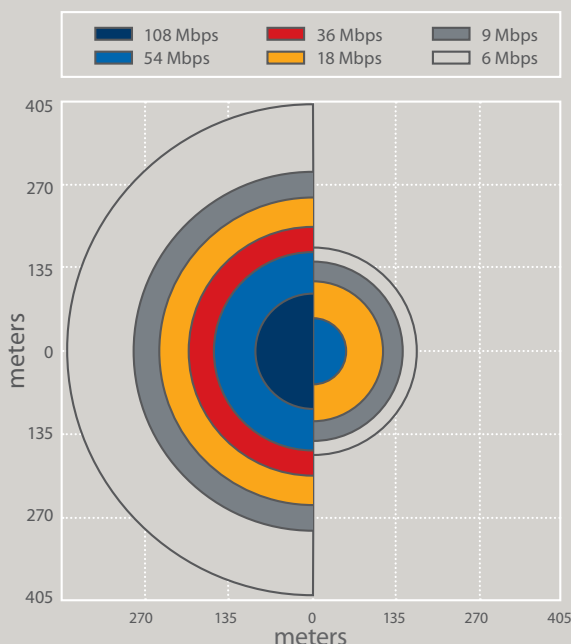
The result is double the coverage and throughput capacity in comparison to standard access points as well as an enhanced user experience. Wavion technology is interoperable with any standard, off-the-shelf Wi-Fi client.

Wavion Beamforming technology on NLOS applications

Wavion SDMA

Wavion's SDMA technology sends two concurrent data streams from the base station to two different users. This doubles the downlink capacity of each base station. SDMA is available as software upgrade.
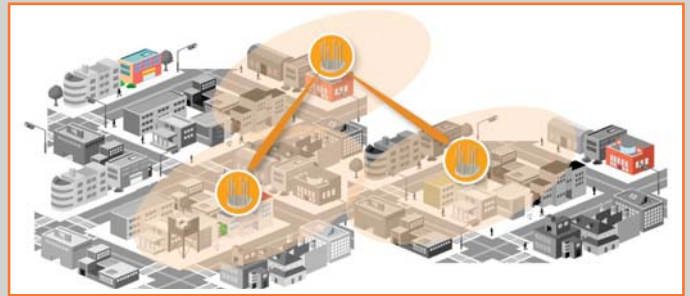

108 Mbps	36 Mbps	9 Mbps
54 Mbps	18 Mbps	6 Mbps

Wavion superior coverage over conventional access points

Self – Backhaul

Wavion beamforming technology can be used to create a strong and robust self-backhaul link with outstanding performance, even in Non-Line-of-Sight (NLOS) environments.

Wavion's beamforming self-backhaul provides very high throughputs, with marginal effect on system capacity.

Wavion SelfBackhaul

Technology Benefits

- **Increased capacity**
  More users per node and increased throughput for each user.

- **Extended range**
  Up to three times the coverage in comparison to competing solutions.

- **Uniform coverage**
  Fewer dead spots and better NLOS coverage outdoors and indoors.

- **Superior indoor penetration**
  Outstanding connectivity to indoor users from outdoor located base stations.

- **Increased interference resilience**
  Due to the beamforming directivity and the continuous Dynamic Interference Handling (DIH) air-link optimization.

- **Open platform**
  Interoperable with any standard Wi-Fi CPE in the market in the 2.4 GHz and 5 GHz bands.

- **Reduced latency and jitter**
  Minimal number of hops between access point and backhaul.

Wavion's cost effective broadband wireless infrastructure offers uniform coverage with a third of the number of base stations typically required for such installations.

This can be translated to over 50% savings in both the deployment cost (CAPEX) and ongoing maintenance cost (OPEX).

WBS Base Stations

Wavion WBS is a family of a carrier class broadband wireless beamforming base stations that provide superior coverage and greater capacity.
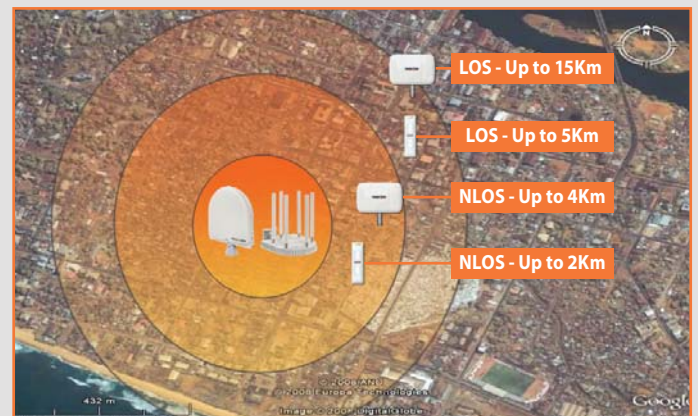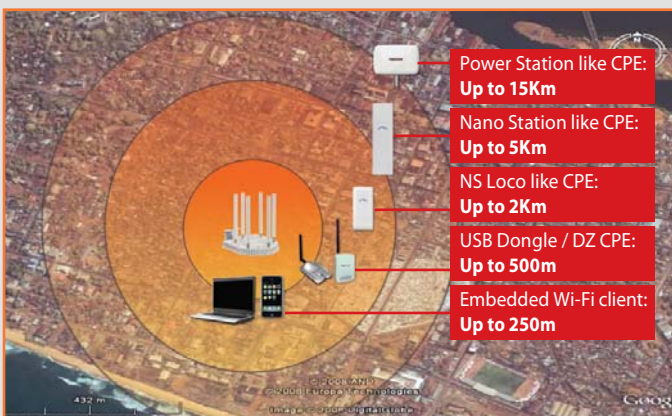
The WBS base stations enable service providers, municipalities, and enterprises to deliver high quality, broadband and outdoor Wi-Fi service with significantly fewer base stations at a much lower cost.
The WBS base stations are based on Wavion's unique and powerful spatially adaptive beamforming technology and operate with any off-the-shelf, standard based, Wi-Fi client.

With significant performance gains in terms of range, throughput, indoor penetration and interference mitigation, service providers can offer highly cost effective broadband wireless service without compromising quality.

WBS Product Flavors

- **WBS-2400 Omni**
  Omni-directional base station with a 6-antenna array operating in the 2.4 GHz band.
- **WBS-2400 Sector**
  Directional base station with a 3-antenna array covering a 120 degree sector and operating in the 2.4 GHz band.
- **WBS-5800 Omni**
  Omni-directional base station with a 6-antenna array operating in 5.8 GHz band.
- **WBS-5800 Sector**
  Directional base station with a 3-antenna array covering a 120 degree sector and operating in the 5.8 GHz band.
- **WBS-5000 Sector**
  Directional base station with a 3-antenna array covering a 120 degree sector and operating in the 4.9 GHz-5.9 GHz band.

Power Station like CPE: **Up to 15Km**
Nano Station like CPE: **Up to 5Km**
NS Loco like CPE: **Up to 2Km**
USB Dongle / DZ CPE: **Up to 500m**
Embedded Wi-Fi client: **Up to 250m**

Expected coverage range with
Wavion WBS-2400

LOS - Up to 15Km
LOS - Up to 5Km
NLOS - Up to 4Km
NLOS - Up to 2Km

Expected coverage range with
Wavion WBS-5000

Wavion Dual Frequency Solution

High-end access and backhaul solution utilizing beamforming base stations for access at 2.4 GHz and backhaul at 5 GHz. The dual frequency solution provides high performance, high capacity, and superior NLOS connectivity.

Omni Base Station 2400/5800   Sector Base Station 2400/5000
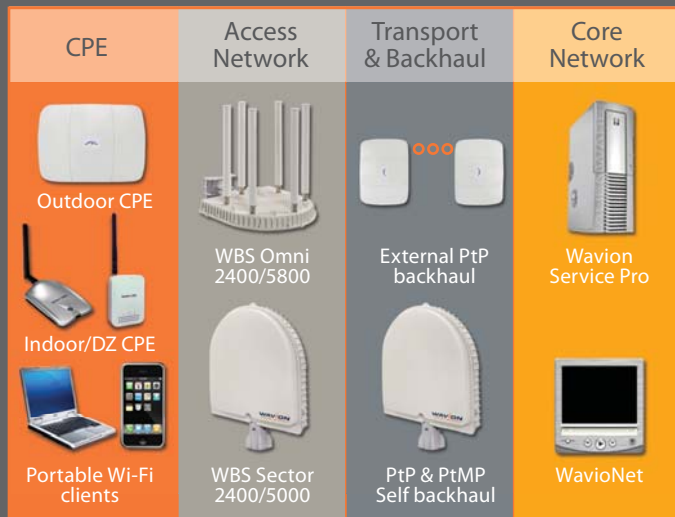

Wavion Dual Frequency deployment

End-to-End Solutions

Wavion has created complete, end-to-end solutions for outdoor infrastructures, which include the base-stations, backhaul and CPE equipment, as well as Network Management, Billing and Provisioning applications. This ensures that carriers, service providers, and governments are able to deploy their wireless networks quickly and effectively.

CPE	Access Network	Transport & Backhaul	Core Network
Outdoor CPE	WBS Omni 2400/5800	External PtP backhaul	Wavion Service Pro
Indoor/DZ CPE	WBS Sector 2400/5000	PtP & PtMP Self backhaul	WavioNet
Portable Wi-Fi clients			

Access

The WBS base stations operating in the 2.4 GHz and 5 GHz bands are based on Wavion's unique and powerful spatially adaptive beamforming technology and work with any off-the-shelf, standard based, Wi-Fi clients.

Backhaul

Wavion provides several complementary solutions for backhaul to address a variety of customer requirements.

- **Beamforming Self-Backhaul**
  Low cost solution provided as an integral part of the WBS-2400 and WBS-5800 functionality.
- **Dual Frequency Backhaul**
  High end solution with directional antennas in the 5 GHz band in cases that require dedicated high capacity backhaul.
- **Low cost Dual Frequency Backhaul**
  Low cost solution with directional CPEs at 5 GHz providing backhaul to WBS-2400s used for Wi-Fi access.
- **External Backhaul**
  Various solutions such as VSAT, Cellular BTS, and PtP links.

CPEs and Wi-Fi clients

Wavion base stations are interoperable with any 802.11a/b/g standard CPE in the market:
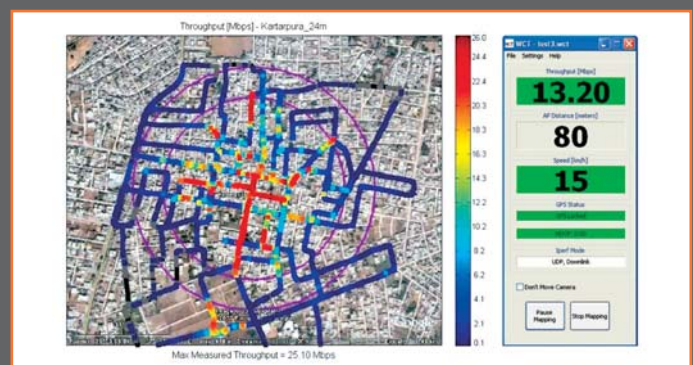- Mobile Wi-Fi clients such as those embedded in laptops and smart phones.

- Outdoor CPEs used by high-end and business users, which require high throughput and a coverage area of several kilometers. These CPEs usually require professional outdoor installation.
- Indoor CPEs targeted for business and residential indoor applications. These "plug and play" CPEs are easy to install by non-technical users.

Wavion has approved specific CPE models to optimally meet the requirements of different applications.
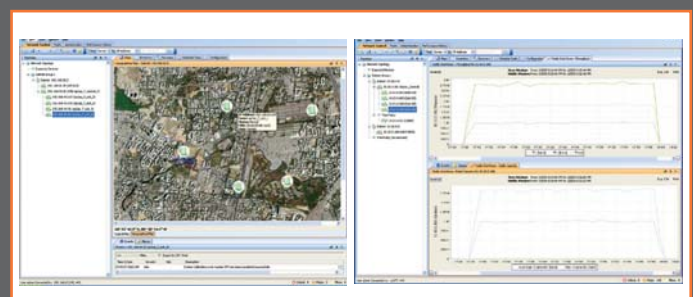
Wavion Coverage Tool

Wavion Coverage Tool (WCT) enables service providers to test and validate the Wavion WBS base stations coverage in real-life conditions.

WavioNet - NMS

Wavion's Network Management System (WavioNet) is a comprehensive, carrier-grade tool enabling operators to effectively control and monitor their Wi-Fi network. WavioNet provides support for various network operation aspects and allows network managers to carry out day-to-day monitoring and control activities, as well as plan network expansion.

Wavion Service-Pro

Wavion Service-Pro is a comprehensive OSS/BSS service management solution for broadband wireless providers based on three components - the RADIUS server, the payments management module, and the access controller.

The Service-Pro suite offers a wide range of capabilities including subscriber management, bandwidth management, billing, service plans and captive portals.

APPLICATIONS

- **Business connectivity**
  Provide broadband access with high quality of service to business users.

- **Residential access**
  A cost effective solution with self-installed indoor CPEs for broadband wireless service.

- **Municipalities**
  Provide a broadband wireless network for multiple applications including internet connectivity to municipal buildings, free internet access in public places, automatic meter reading (AMR), traffic control, etc.

- **Video surveillance**
  Leverage the high quality broadband wireless network to provide connectivity to multiple video cameras.

- **VoIP / Rural connectivity**
  Support multiple remote customers with few base stations and offer Voice over IP (VoIP) service.

- **Internet to schools and communities**
  Provide internet access to schools and communities in developing countries as a tool for bridging the "digital divide".

- **Building coverage / Hospitality**
  Provide broadband wireless internet access with minimal infrastructure costs.

- **3G offloading**
  Releasing the 3G data congestion with a complementary Wi-Fi network, servicing smart phones and other Wi-Fi enabled devices.

WBS-2400 Omni - Typical Application

WBS-2400 Sector - Typical Application

WBS-5800 Omni - Typical Application

WBS-5000 Sector - Typical Application

ABOUT WAVION

Wavion is a technology leader in Metro and Rural Wi-Fi and Wireless broadband access, with deployments in more than 57 countries.

The company's digital beamforming and SDMA technologies are the first and only to resolve the significant performance, penetration and profitability challenges facing large scale Metro and Rural deployments.

Wavion end-to-end solutions feature the WBS omni-direction and sector base stations, operating at 2.4 GHz and 5 GHz, as well as a complete portfolio of access, backhaul, CPEs, NMS, service provisioning and billing products.

With superior coverage and greater capacity, Wavion's solutions enable carriers, service providers and governments to deliver high quality service in urban and rural applications while reducing CAPEX and OPEX by more than 50%.

Founded in 2000 Wavion, with headquarters located in Yoqne'am, Israel, the company has worldwide offices in Miami, Florida, Dallas, Texas, San Paulo, Brazil, Buenos Aires, Argentina, Lima, Peru, Bogotá, Colombia, Moscow, Russia, and New Delhi, India.

Sales: sales@wavionnetworks.com • **General Information:** info@wavionnetworks.com
Support: support@wavionnetworks.com • **Public Relations:** pr@wavionnetworks.com
Careers: careers@wavionnetworks.com

Wavion Corporate Headquarters Wavion Ltd. 5 Ha'mada Street.
PO Box 580 Yoqne'am-Illit 20692 Israel Tel: 972.4.909.7300 Fax: 972.4.909.7322
www.wavionnetworks.com

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