

Municipal Broadband Wireless Solutions



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Agenda

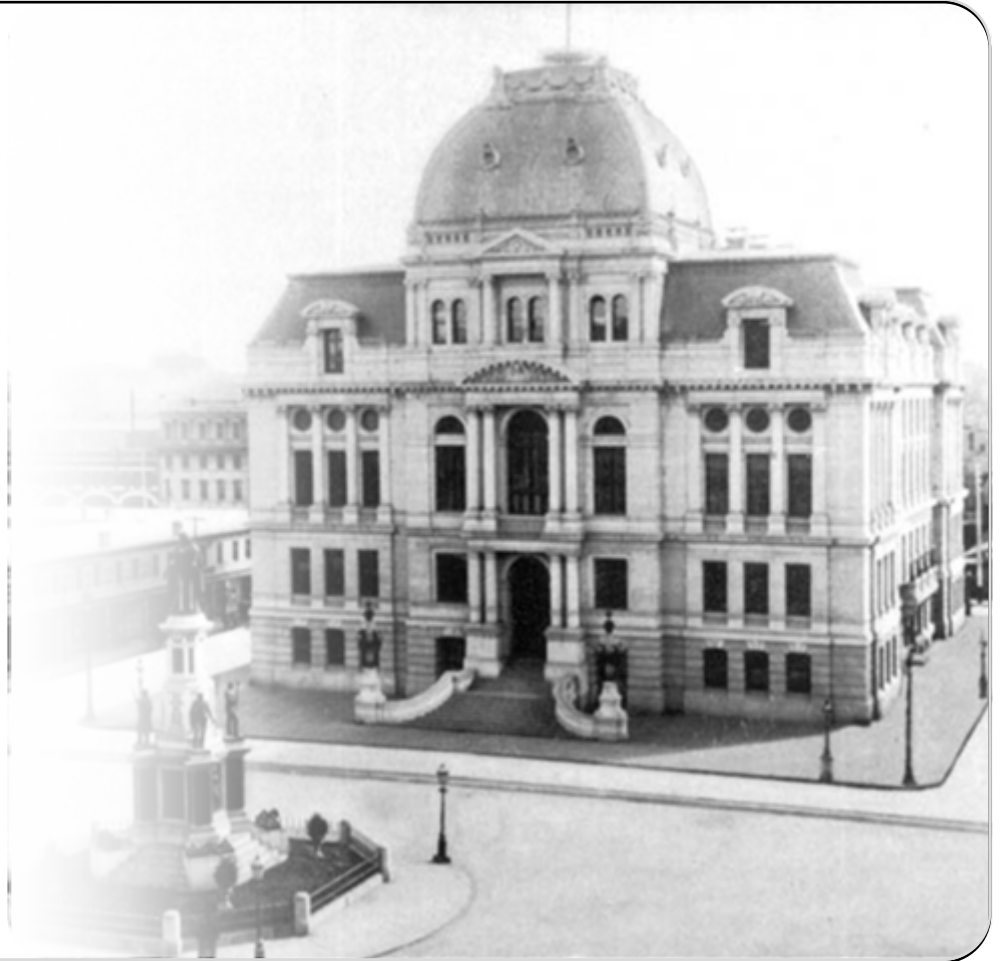


- **Municipal Market & Players**
- **Municipal Applications:**
 - **Public Safety**
 - **Traffic Management**
 - **Education**
 - **Broadband for Councils**
- **Deployment considerations**

The Municipality Application



- **Historically, municipalities have played a key role in enabling new infrastructure (electricity, roads, telegraph and railways)**
- **Local municipalities are committed to their own communities**
- **Municipalities have power, incentive and means to develop communities**



Municipal Business Values



- **Efficiency and better service**
- **Enhanced quality of life and public satisfaction**
- **Advanced education system**
- **Improved public safety**
- **Positive PR**
- **Increased income**





No single business model is unique to municipalities

As the market evolves, various business models form, bringing different players into a variety of partnerships:

- Government
- Local municipalities
- Local enterprises
- Service providers
- System integrators
- Fixed operators (WISPs)



As the market matures and project volume increases, larger players enter the scene including nationwide and international service providers and system integrators

Municipalities: Business Case Types



A range of business cases according to geographic, geopolitical and business environments:

- Full government funding
- Local municipality:
IT ROI-based or service-oriented
- Cooperation between local municipality and enterprises or service providers
- Independent local organizations (cooperatives)



ROI is often second to social/political criteria

How to Approach Municipality Players



	Mayor	Security	Education	IT Manager	CFO
The Motivation	Happy citizens, re-election	Secure community	Education for everybody	Control and tranquility	ROI
What Message can Open the Door	Increased public satisfaction	Control and safety	Equal opportunity for everyone	Extended reach for IT department	Efficiency and cost reduction
How to Captivate Them	Case studies, visits to other cities, public relations	Present ecosystem with partners, case studies	Present ecosystem, principal feedback	Free training, demo kit, white papers	Business case tool
Priority Projects	Security, health, education, Internet access	Video surveillance	Connecting schools, digital classrooms	Remote access to IT application, redundancy	IP-PBX, leased line replacement
Role	Key decision maker	Decision maker	Decision maker	Influencer	Influencer
How they can Help	Give blessing, reference	Allocate budget, help with external funds	Help with external funds	Help with writing bid specifications	Share internal ROI results



Improved Public Safety

- Monitor public locations and critical facilities
- Identify illegal activities
- Track criminals recorded while committing a crime
- Connect first responders to municipal applications
- Provide real time video to and from vehicles
- Improve emergency situation management
- Enhance feeling of public safety



Public Safety (1)



Monitoring and Awareness

Wireless networks enable reach to almost anywhere in the city



Command and Control Center

Wireless networks provide capacity to aggregate data to control center



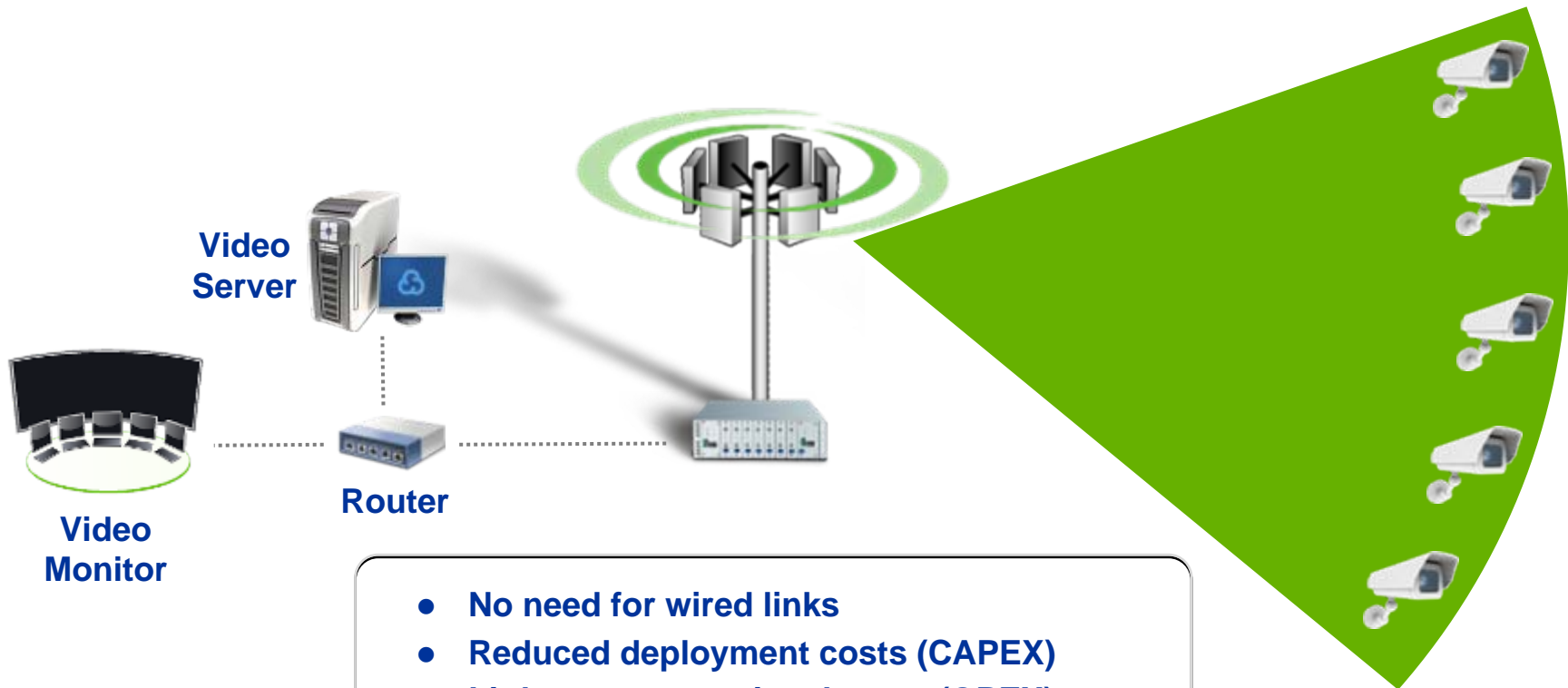
Rapid Response Teams

Wireless networks are the only solution for mobile coverage



Public Safety (2)

Wireless Video Surveillance Benefits



- No need for wired links
- Reduced deployment costs (CAPEX)
- Little to no operational costs (OPEX)
- Rapid deployment time
- No need for cable route approval
- Flexibility and scalability
- Secured connectivity
- Mobile and portable support

Roissy, France



Customer Type

Municipality/Law Enforcement

Country / Region

Roissy, France

Application

Broadband data for law enforcement officers in the field

- Community of 14 towns and villages spread around the Charles de Gaulle airport
- Created Municipal police force
- Built a Mesh network of all villages using PTP links (200 square km)
- Deployed CCTV cameras in each village that are connected to village center using several PtMP sectors
- Equipped local police cars with an Alvarion CPE, enabling video feed transmission directly to police cars on-the-move



Roissy, France: Images



Traffic Management



Enhanced Traffic Management

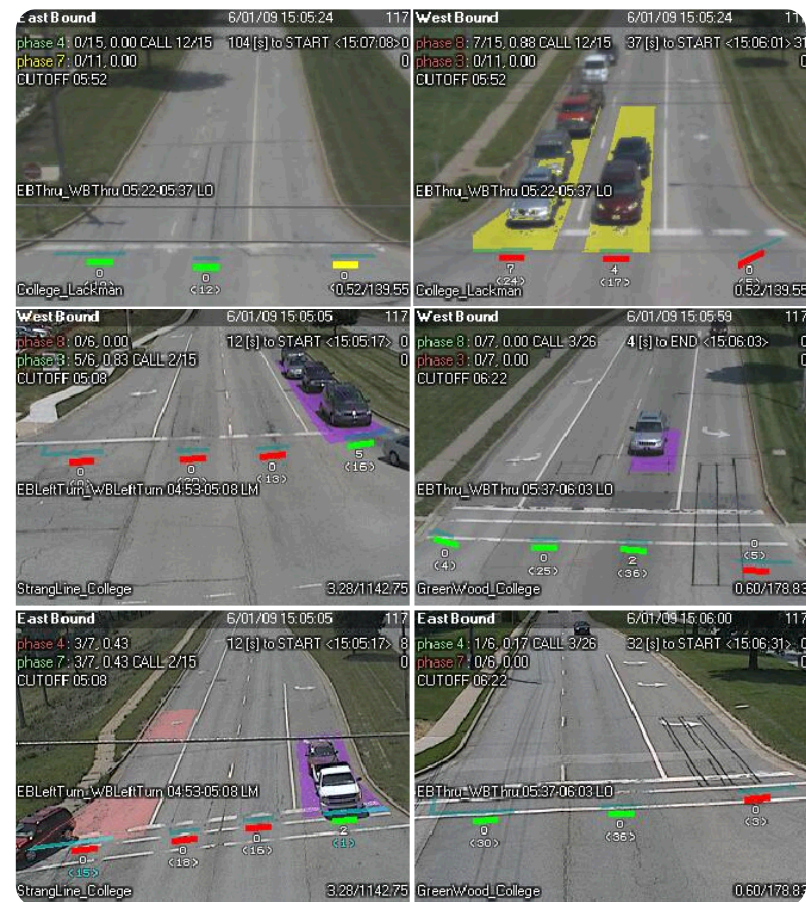
- Balance traffic loads
- Reduce pollution
- Reduce accident rates
- Provide driver alerts on road conditions and hazards
- Expedite emergency event handling
- Monitor speed-limits



Enhanced Traffic Management

Full synchronization of traffic lights and sensors in a large area results in:

- Reduced delays
- Lower fuel consumption
- Decrease in harmful emissions



Lenexa, USA



Lenexa
K A N S A S



Customer Type

Municipality

Country / Region

Kansas City, USA

Application

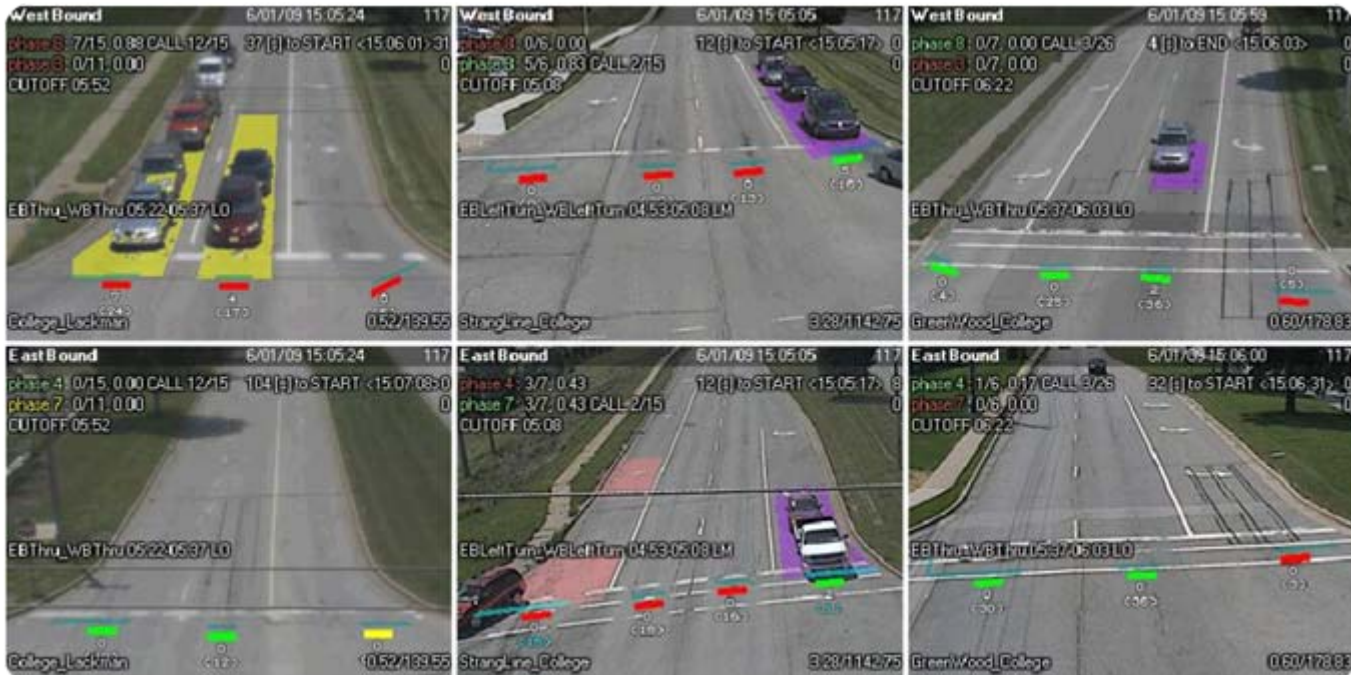
Video surveillance cameras

- **City in greater Kansas City area**
- **Deployment is state-driven by ITS (Intelligent Transportation System) program with participation from 19 cities in 2 states**
- **Extension of fiber backbone**
- **Fixed connectivity to traffic lights, cameras and buildings**
- **Mobile coverage**



Lenexa, USA

- Full synchronization of traffic lights over a large area
- Delays reduced up to 21%
- Fuel consumption reduced up to 18%
- Harmful emissions reduced up to 15%





e-Education

- **Provide remote education via shared or dedicated networks**
- **Offer interactive learning**
- **Connect remote schools and universities to remote libraries and research facilities**
- **Utilize remote research computers and databases**



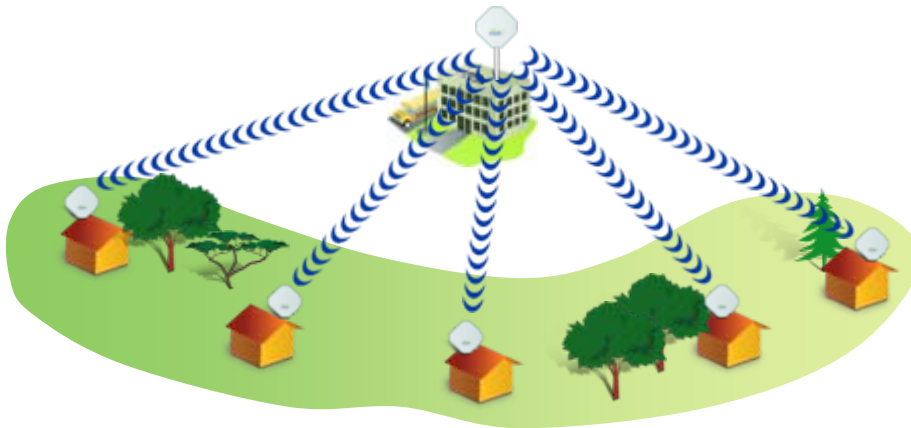
e-Education (1)



Connecting schools with broadband (>2 Mbps)
Enabling digital classrooms with Internet access

Private educational network with full control of access and content

Schools become small WISPs with their own content servers and remote learning activities



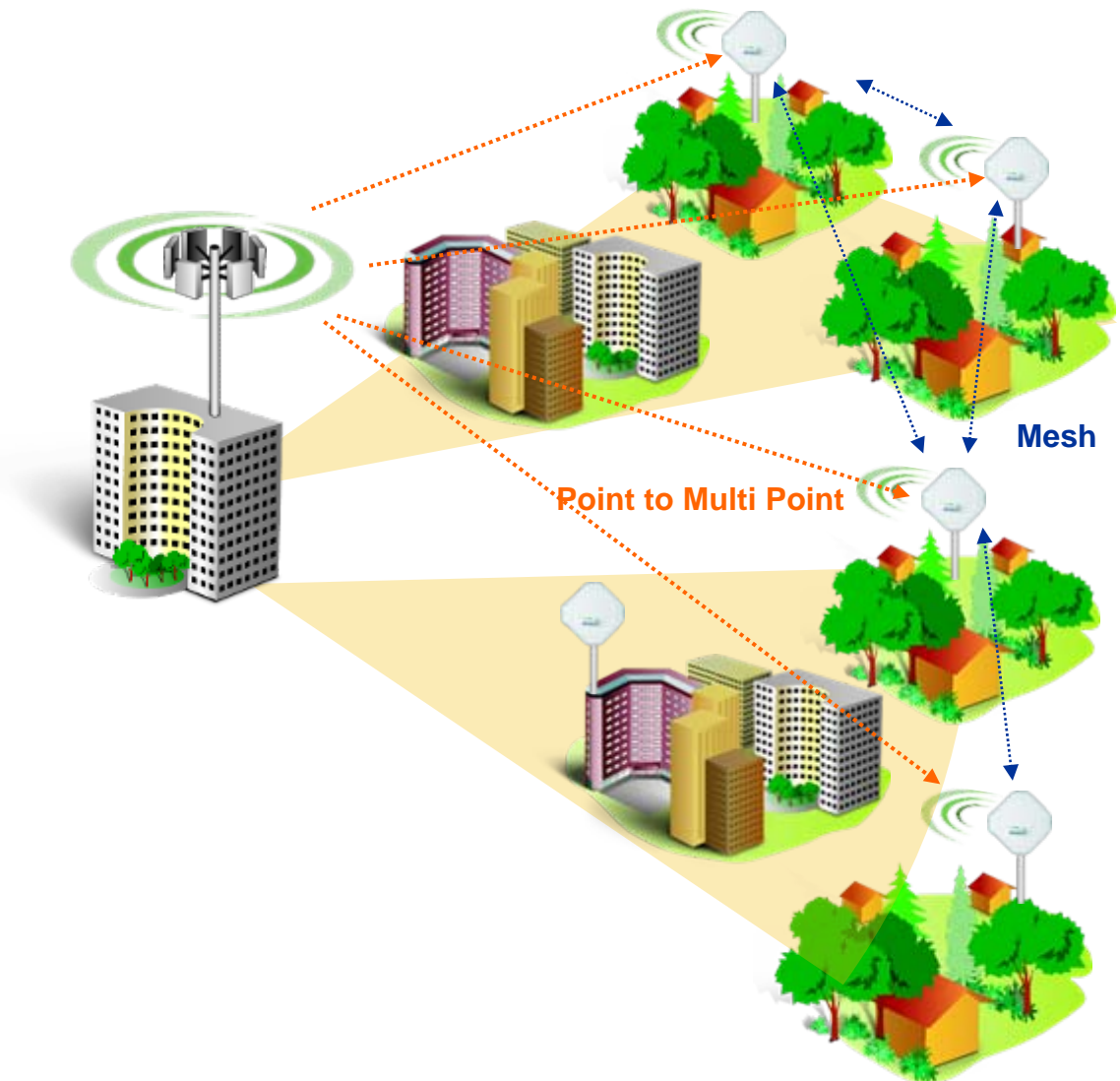
e-Education (2)

Single access for students anywhere:

In campuses and labs with PTP links

Outdoors with WiFi and USB dongles

At home with a WiMAX WAN network



Krosno, Poland (1)



Deploying multiple applications for municipal and public use

The Challenge

- **Improve educational resources with broadband Internet access**
- **Improve community security and of quality life**
- **Limitations of wired solutions**
 - Low throughput
 - Poor Quality-of-Service
 - Costly and lengthy laying of fiber cable

The Solution

- **Deployed Alvarion's BreezeMAX in 3.5 GHz**
- **6 sectors cover the entire city**
- **Connecting 13 schools and libraries**
- **Network is used by police for CCTV cameras**
- **Free public Internet access using Alvarion's BreezeMAX Wi² solution**

Krosno, Poland (2)



Deploying multiple applications for municipal and public use





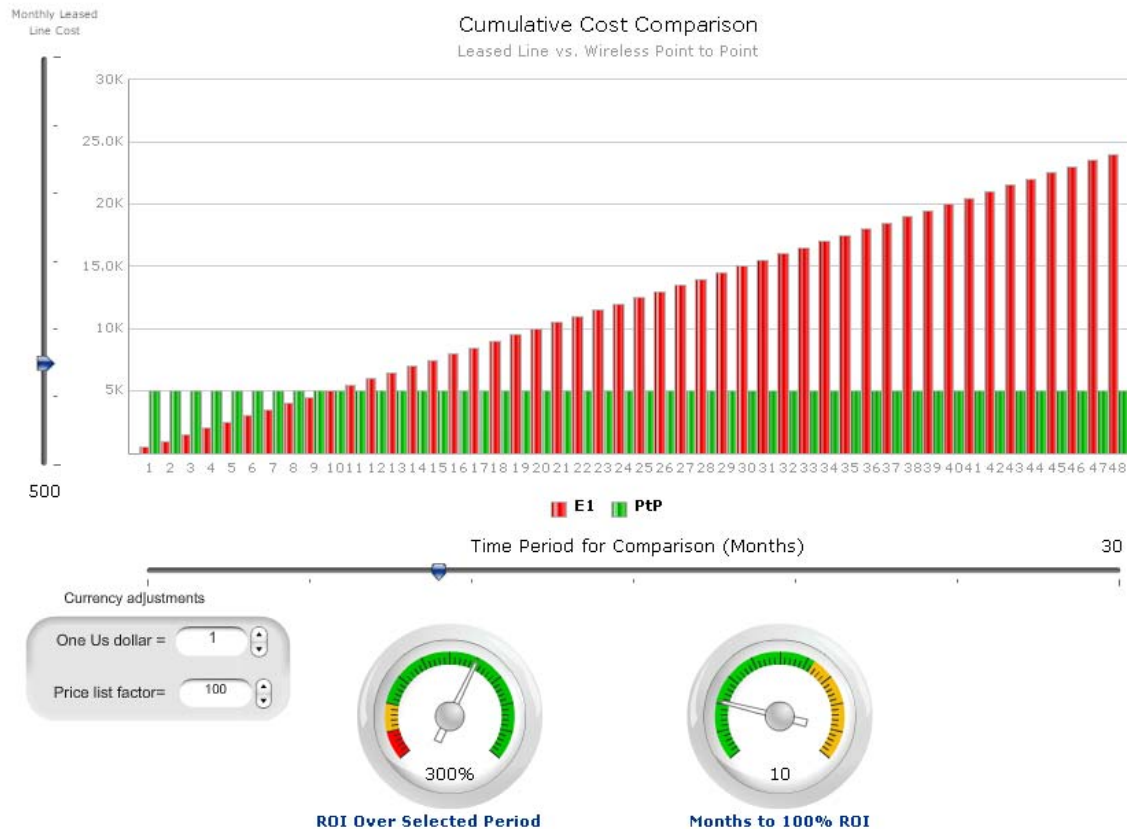
Cost Reduction

- Replace leased lines with wireless PTP/PtMP links saving on monthly/annual fees and get better SLAs
- Reuse equipment for a new link, after existing link is no longer required
- Utilize Voice over IP (VoIP) in specially deployed networks



Cost Reduction – Leased Line Replacement

“ Our network costs are down by 50% thanks to the Alvarion wireless solution. It was a simple case of ‘pay less and get more’.
Ged Bell, Head of IT, Dundee City Council ”

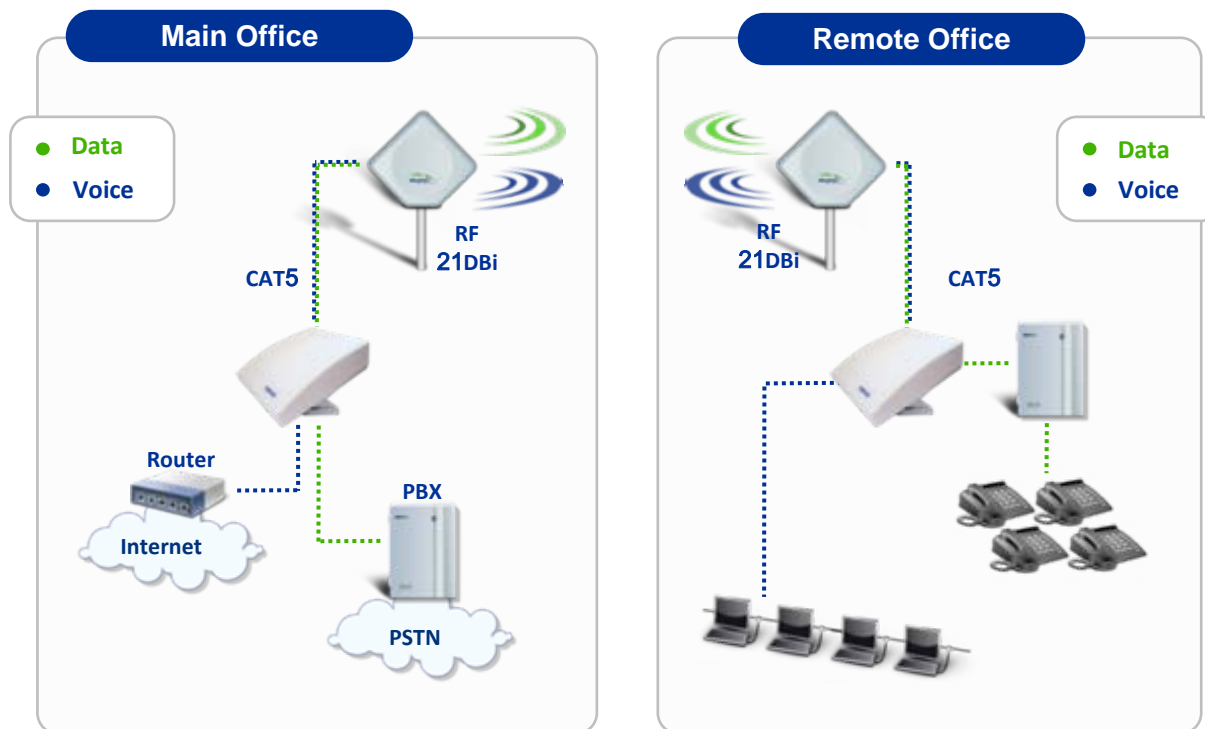


Cost Reduction - VoIP

VoIP can be used in same wireless network as data and video as long as there is a QoS guarantee mechanism

Alvarion products support QoS both in the air and then on land

“ Alvarion's solution not only provides us with excellent voice and data services, it has enabled the citizens of the community to benefit from enhanced safety and security. ”
CCRPF



Utilizing a Single Link for Both Voice and Data



SELECT PRODUCT:

BreezeACCESS VL...

BreezeACCESS 49...

BreezeACCESS VL...

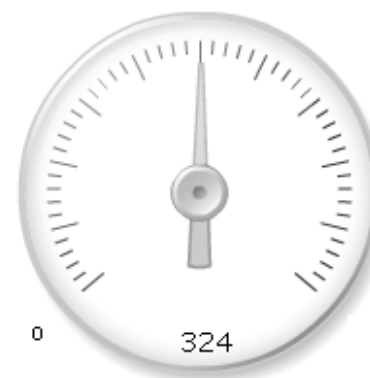
BreezeNET B100

NOTE: Capacity numbers provided are only applicable for BreezeACCESS VL & BreezeNET B hardware Revision C or higher (for both AU / BU & SU / RB). Data and voice capacity figures provided above assume ideal conditions.

Data Capacity per Sector (Mbps FTP)



Max. Voice Calls per Sector



Percentage of Capacity Allocated to Voice

50%



Broadband for Councils

- Provide public Internet access (Hot Zones)
- Offer residents a city portal and information access
- Build information and emergency kiosks

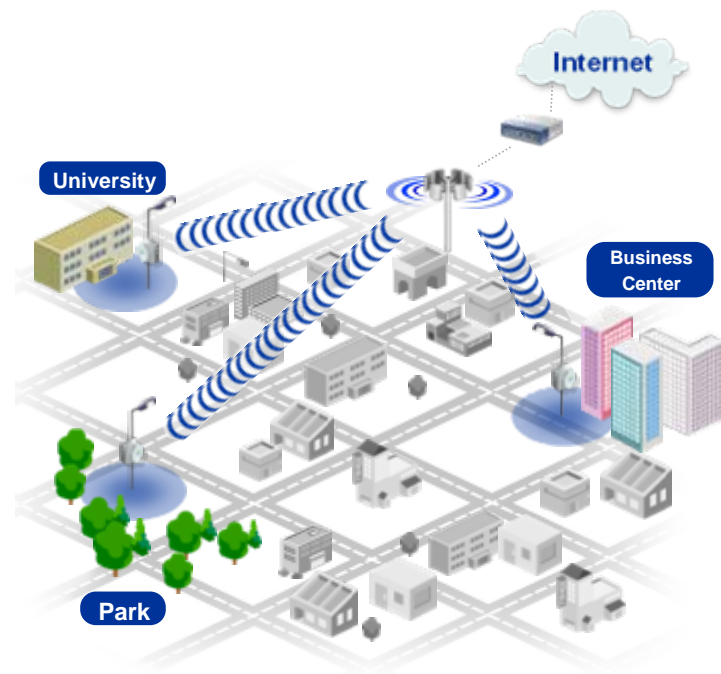


Broadband for Councils (1)

City portal for municipal services and activities

The screenshot displays the Krosno City Portal (KrosnoCity.PL) interface. At the top, there's a navigation bar with links for 'Aktualności', 'Anonim', 'Galeria', 'KROSNO.CITY.PL', 'Baza firm', 'Społeczność', and 'Forum'. Below this is a search bar with a 'Szukaj' button. The main content area features a large banner for 'SOBOTA - wstęp 15 zł, grymy szybkiej, sety autorskie i nowości' and 'Okrzeź 1 (w Galerii Zawodzie) Rezerwacja 0 518 448 571'. Below the banner, there's a section titled 'WOŚP 2010, 18 finał Fundacji w Krośnie i Iwoniczu' with a photo of a group of people. To the right, there's a section for 'Krytyka w Krośnie' with a photo of a person. At the bottom, there's a 'Polecamy' section with a photo of a group of people. The left sidebar contains a list of links for various services and activities, including 'XVIII Finał WOŚP 2010', 'O mieście', 'Przewodnik turystyczny', 'Przewodnik muzealny', 'Informacja dla firm', 'Kultura', 'Sport', 'Powiat', 'Publicystyka', 'Styl życia', 'Kino i Film', and 'Polecamy'.

WiFi hotspots as a free public service - access in different areas of the city



Broadband for Councils (2)



Information kiosks, linking to Internet or city portal



Emergency kiosk with voice and video access to local police



Outer Hebrides, Scotland



Customer Type

Rural Municipality

Country / Region

Outer Hebrides - Scotland

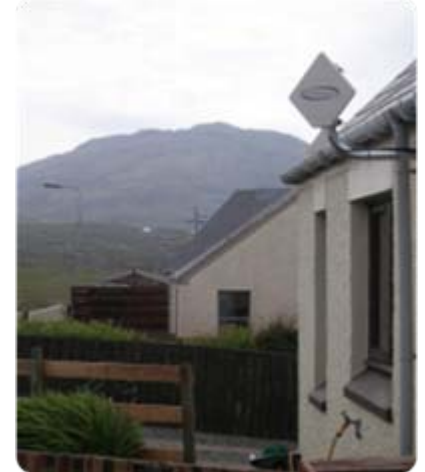
Application

Digital community

- Remote rural community
- Harsh weather conditions
- No broadband access
- Required full data access solution
- Needed additional access to municipal services, local businesses and residents



Outer Hebrides: Images



Diverse Range of Applications



CCTV



**High uplink capacity
in specific points**

Hot Zones



**Best effort QoS in
designated areas**

Traffic Sensors



**Low capacity in
wide areas**

e-Education Networks



**PtMP with medium
downlink capacity**

Campus Connectivity



**PTP in various
capacities**

AMR



**Low capacity in wide
areas**

VoIP for City Workers



**High QoS in
wide areas**

Considerations of the Chief Information Officer (CIO)



- Different applications have different needs and characteristics
- Various technologies
- Budget is usually targeted for specific applications
- Limited budget and resources
- Projects are long term and ongoing
- Same staff for network installation and maintenance (city employee or subcontractor)



Alvarion's Modular Solution

Answers application needs according to budget, time and other resources available



Summary



Alvarion's solution is complete, modular, robust and scalable enabling municipalities to achieve maximal performance in their environment



Thank You



Caravaggio, Italy (1)



Customer Type

Municipality/Law Enforcement

Country / Region

Caravaggio, Italy

Application

Broadband data for law enforcement officers in the field

URL

<http://www.poliziacolli.it>

- **Inter-municipal Police Force Association, a province of the Bergamo-Lombardy region**
- **Video surveillance in an area that could not be covered by optical fiber**
- **Guarantees an emergency service to citizens via wireless LAN networks and IP cameras and in future, a mobile office vehicle with a video-control system**
 - 35 square km
 - 7 municipalities
 - 80 cameras
 - 20 km coverage



Caravaggio, Italy



Street level NLOS camera



Remote camera with PTP link





WiMAX Solution for intelligent transport management

The Challenge

- Provide a cost-effective and reliable connectivity solution to support an Urban Traffic Management Control (UTMC)
- Utilize the 3.3 GHz frequency
- Support bandwidth-intensive digital CCTV systems
- Enable traffic lights and road sensors to utilize same CCTV infrastructure
- Assure link reliability

The Solution

- Deployed BreezeMAX®, Alvarion's WiMAX™ solution
- All traffic information captured by cameras, SCOOT system and traffic signals (26 systems including; 40 cameras, 130 traffic light sensors and car park sensors) is consolidated in a central control center
- Alvarion's flexible network can be used for additional applications such as CCTV and WiFi on busses



Connectivity for e-Education

The Challenge

- Increase personal access to ICT (Information and Communications Technology) at home for disadvantaged secondary-age pupils
- provide a cost-effective, safe and reliable connectivity solution
- Create a proprietary, secure school network
- Develop flexible infrastructure ready to use for additional applications

The Solution

- Deployed Alvarion's BreezeACCESS® EZ in 5.8 GHz
- Network was built in under six weeks delivering basic, safe connectivity for residential access
 - 21 sectors
 - 600 CPEs
- This solution in 5.8 GHz was 8 times cheaper than standard 2.4 GHz Mesh
- Council is planning to use network for backhauling in 2.4 GHz WiFi for new marine