

WIRELESS & DIGITAL CITIES CONFERENCE

SEPTEMBER 2007

PRESENTATION ANALYSIS REPORT

Author: Nick Gill, Intercai www.intercai.co.uk

This report provides:

- An analysis of Presentations
- A report on a number of matters featured
- Guidelines for Local Government regarding State Aid & the Approach to Setting up a Network
- A glossary of terms and technology

Do let me have your feedback, whether as a presenter regarding the analysis or as an interested party and in any related matter of wireless and digital cities.

Nick Gill email nick.gill@intercai.co.uk



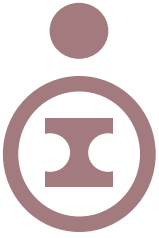
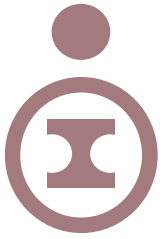


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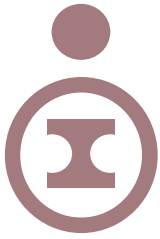
1 SUMMARY

The 2007 conference marked a milestone in the establishment of wireless & digital communications technology in numerous municipalities throughout Europe and around the world. Whereas the previous 2006 conference featured plans for networks and a degree of hypothesis, the 2007 event was one of reality. The common theme of the presentations was one of achievement and practical results of municipal networks. The presentations illustrated many live networks to serve respective communities and plans for the further development of these to deliver further benefit to the locality.

Talking to Chris Vein, CIO, San Francisco at the end of the event, he said this was the best conference he had ever been to. Praise indeed and due to the amount and quality of practical information on achievement, in contrast to the theorising usually found in such events. All this will make next year's conference a challenge in terms of doing even better. I have put together this analysis and guide to the presentations to serve a number of purposes:

- To do justice to the quality and scope of the material
- To help attendees and others to find information they need from the material
- To provide a platform to determine where we go next with the conference

Wireless & Digital Networks can serve a wide range of purposes but they don't need to be too ambitious. Some have been set up and are operated by the municipality to satisfy a specific functional purpose. At the other end of the scale, there are networks that are used to satisfy a number of municipal purposes and to provide services to the community and also local business. The responsibility for the operation of a number of these networks in some cases has been the public sector organisation they serve and in many other cases has been a telecommunications service provider.

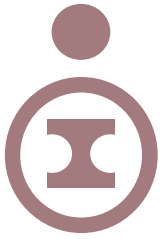


2 PRESENTATION ANALYSIS NOTES

These notes provide guidance to the presentation analysis tables from page 4 onwards.

Please Note: this is a high level analysis and for further information, please refer to the individual presentations, available to delegates from Imago.

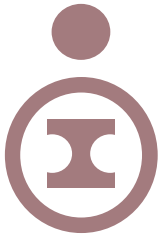
- The presentation Title indicates the theme of the presentation and additional information is provided in the Comments row
- The Organisations comprise mostly local government that have set up networks. There is a good balance of industry and supplier input, particularly regarding technology appraisals, trends and statistics. It all makes good reading.
- The analysis rows are arranged into the categories of Network Purpose, Funding, Operational and Functional Application. **GREEN** indicates a Live network status for each sub-category and **YELLOW** indicates a Planned status for the network. There is explanatory text where applicable in sub-category items.
- Network Purpose
 - Internal means a network for Local Government's own use. The networks that are featured in the presentations invariably serve Local Government needs but there are exceptions.
 - Community – here the network serves community interests and the focus of this varies. Often it applies to the provision of eGovernment (eGov) information and services to individual and business members of the community. Provision of free access to eGov is frequent and this can be allowable within the context of State Aid rules. There are other community interests served such as information for visitors, to support tourism and in hospitals where information services are provided to patients.
 - Business – often the focus of the network is on the needs of Local Government and the community, particularly providing assistance to disadvantaged and socially deprived members who cannot readily afford a broadband service. However in a number of cases, whereas the priority of the network has been for Internal and Community purposes, the plan for development is to offer services to business, particularly the smaller ones – the so called small office home office (SOHO) and small and medium enterprises (SME) categories. This is supportive of socioeconomic objectives and the financial sustainability of the network through increased traffic and related revenues.
- Funding
 - Public / PPP – there are some networks that are properly funded with public money as they serve a Local Government purpose only. There are others that started as public and, as they have grown, became privately owned and operated. The public private partnership (PPP) model where the Municipality sets up the network through a service provider is popular and provides a balance of serving local needs and off loading the responsibility to a competent telecommunications service provider. This is a complex topic underneath the seemingly simple indications of Public or PPP in the analysis.



- State Aid – provision of free or subsidised internet access, albeit with good intentions to assist disadvantaged community members can constitute anti-competitive behaviour and be raised with the European Commission's DG for Competition. There can be severe and potentially terminal implications for the network and all of the planning and work that has gone into it. See the State Aid section below and the associated guidelines.
- Operational
 - Planned / Live – it was welcome to see such an abundance of live networks with a number of planned ones about to take off.
 - Wireless / Fixed – regarding Wireless, the use of WiFi (Wireless Fidelity, IEEE 802.11) predominates for the networks. WiMAX (Worldwide Interoperability for Microwave Access, IEEE 802.16) is on its way and is referred to in technology appraisals. But there are also the mobile network operators with GPRS and 3G. These are mobile network standards that support the Internet Protocol. They can provide valid solutions to wireless needs for mobile, nomadic and fixed purposes. There are cases where these mobile technologies and services are used.
 - Wireless / Fixed – Of course, there is always the need for Fixed broadband and a number of the presentations involved a mix of Wireless and Fixed networks. Fixed networks can be based on the established copper infrastructure in Cities. However many of the presentations featured the implementation of (optical) Fibre that has considerably superior performance over copper lines. The installation of Fibre is a complex area with lots of new challenges and variables to take into account. These all concern the provision of Fibre in the access layer (also know as Next Generation Access) and can involve a mix of Fibre close to the home and running VDSL over the short length of copper to give Fibre-like speeds. This approach can reduce the considerable cost of digging for Fibre ducting.
- Functional Application

The plethora of live networks is there to serve a functional purpose and not just provide connectivity. There are numerous functional applications that wireless broadband can support and these are the prominent ones that feature in the presentations.

- Community Safety
- Traffic Management
- Transport
- Housing Repairs
- Social Care
- Education
- Emergency Services
- Other



3 STATE AID

State Aid & The Approach to Setting up a Network – Guidelines for Local Government

Keywords: Broadband, wireless, fibre, network demand & supply parameters, intervention & state aid, sustainable business model

The issue of funding of networks and the related responsibility and ownership sparked some lively debates in the conference. The European Commission concern regarding State Aid had been encountered in a number of municipalities. The confrontations with the European Commission centred on the provision by some municipalities of free broadband through their networks and that this is anti-competitive behaviour in relation to the local telecommunications service providers. The rules on State Aid are clear and there is a way of approaching the setting up of a network that can avoid such issues and resulting confrontation. These guidelines provide the key steps, sequence and basis of the approach to dealing with this important area.

Objectives

- Set socio-economic objectives
- Determine a strategy that looks 5 to 10 years out to the needs of the community and options for meeting them

Demand

Understand the needs for networks to serve the community

- Take a holistic view of your Local Government area – public & private sector organisations & the community
- Determine areas for Local Government and other public entities being the anchor tenant through suitable solutions, qualified by Cost Benefit Analysis, and develop a roadmap

Network Architecture

Determine network requirements & options to satisfy them

- Analyse data including demography, propagation & demand
- Determine the architecture for the network(s) to satisfy the demand

Business Case

Putting the network requirements in a financial context and establishing a sustainable business proposition

- Understand your assets and their value to service providers
- Develop an aggregated 3 year traffic model and the capital and operating expenditures of the network to serve it
- Devise the business case for investment, at realistic tariffs, and with a focus on sustainability & explore sensitivities

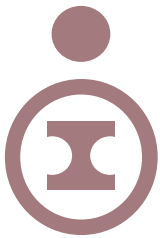
Intervention

Examine options for intervention with due regard to State Aid rules and precedent. This is the key area in relation to State Aid. It is based an analysis of and advice on the factors above.

Supply

Understanding supply option both in-sourced and external

- Where the Local Authority can best add value with due regard to its key competencies
- Understand the competitive landscape, i.e. the capabilities of service & solution providers
- Determine and execute procurements

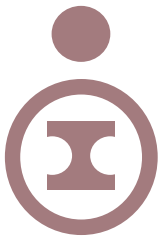


4 PRESENTATION ANALYSIS

The 28 presentations on the next 6 pages can be found in the Imago website that delegates to the September 2007 conference have access to. The focus for the analysis is on those presentations from local government regarding their networks.

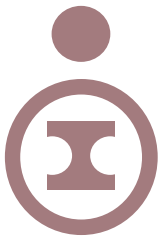
	Title	1 Key Challenges for Local Government for Wireless & Digital Service Provision	2 Digital Cities: Developing a Sustainable Business Model and Driving Regeneration	3 Urban Nets, Rural Nets – Allies or Rivals?	4 Building Digital Communities – Efficiency & Public Safety:	5 Managing the Next Stages of Growth through Organisational Change and Government Mergers
	Presenter	Nick Gill Director	Nick Leon Director	Robert Horvitz Director	Danièle Auffray Deputy Mayor of Paris	Paul Duffy Information Systems
	Organisation	Intercai Mondiale Ltd	Innovation Studies Centre Imperial College London	Open Spectrum Foundation	City of Paris	The Belfast Health and Social Services Trust
	Comments	Role of Local Government	Barcelona 22@	Rural vs Urban analysis	Multiple Operators	Rich set of wireless applications
Purpose	Internal				eGov	Clinical Apps
	Community				Free Access + visitors	
	Business				SOHO, SME	
Funding	Public / PPP				PPP	Public
	State Aid					
Status	Planned / Live				80% by 2009	Live
	Wireless / Fixed			Wireless vs Fixed	Wireless / Fibre	Wireless
Functional Application	Community Safety					
	Traffic Manage					
	Transport					
	Housing Repairs					
	Social Care				Social housing access	
	Education					
	Emergency Services					Hospital
	Other					

LIVE NETWORK	PLANNED NETWORK
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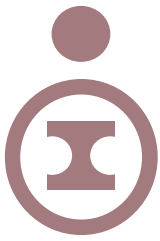
	Title	6 Public Policy and Private Attitudes: Managing the Dynamics of an Evolving Long Term Project	7 Lower Costs and Higher Revenues: Commercial Internet Access / IPTV / Hotzones	8 Creating a Sustainable Commercial Model for a Wireless City	9 Stuttgart: Bridging Transport, Traffic and Tourism	10 WiFi in Liverpool: European Capital of Culture 2008 - Strategic, Financial and Decision-Making Processes
	Presenter	Jaroslav Solc Head of IT Development	Dave Carter Digital Development Agency Head	Jon Lane Programme Director	Holger Bach Director Mobility Cluster Programme	Stephen O'Brien e-Gov Project Manager
	Organisation	City of Prague	Manchester City Council	BT Wireless Cities Programme	Stuttgart Region Economic Development Corporation	Liverpool City Council
	Comments	EC State Aid ref NN 24/2007	Digital Cooperative	Number of UK Cities	MobilCity	WiFi in Liverpool
Purpose	Internal	eGov	eGov	eGov	eGov	eGov
	Community	eGov only	eGov + Cheap Access	eGov + visitors	Free eGov + visitors	eGov + visitors
	Business	Not permitted (EC ruling)		SOHO, SME		SOHO, SME
Funding	Public / PPP	Public	PPP	PPP	PPP (13) inc The Cloud	PPP BT
	State Aid	EC Issues				
Status	Planned / Live		2007	Live	Live	2007
	Wireless / Fixed			Wireless	Wireless / Mobile Internet	Wireless
Functional Application	Community Safety			CCTV		CCTV
	Traffic Manage			CCTV		CCTV
	Transport			Transport information		Transport information
	Housing Repairs			Operative support		Operative support
	Social Care					
	Education			Schools, higher education		Schools, higher education
	Emergency Services					
	Other	Maps		Mobile Working	Portal Multiple Service Prov	

LIVE NETWORK	PLANNED NETWORK
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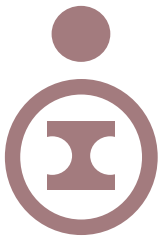
	Title	11 Technology Innovations	12 Municipal Broadband Lessons from the U.S	13 The Mobile WiMAX Technology	14 Overcoming Key Barriers to Muni Broadband Success	15 Building the Largest Free Wi-Fi Network in Belgium: The URBIZONE
	Presenter	Mats Hedenström Marketing Director	Craig Settles Author, President	Dr. Hikmet Sari Professor & Chair Telecoms Department	Craig Settles Author, President	Hervé Feuillien General Manager
	Organisation	Kista Science City, Stockholm	Successful .com	Ecole Supérieure d'Electricité (Supélec)	Successful .com	Brussels Regional Informatics Center
	Comments	Social Care Focus	Keep on Budget for City Network	Technology appraisal	The industry, the needs & recommendations	
Purpose	Internal	eGov				eGov
	Community	eGov				Free Access
	Business					Plan for SOHO, SME
Funding	Public / PPP	PPP				Public
	State Aid					EC Issues – see Prague
Status	Planned / Live	Live				Live
	Wireless / Fixed	Wireless / Mobile		Mobile WiMAX		Wireless
Functional Application	Community Safety	Elderly Care TV SMS MMS				
	Traffic Manage					
	Transport					
	Housing Repairs					
	Social Care	Visually impaired				
	Education	Learning tools				Campus
	Emergency Services	Patient Monitor				
	Other	Maps				

LIVE NETWORK **PLANNED NETWORK**



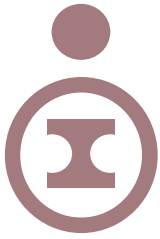
	Title	16 Wi-Fi Applications for Today and Tomorrow: Cloud Chasing and Project Transformation through Developing Local Ideas	17 Deutsche Bahn in Berlin: Developing a Multimedia Platform as a Solid Foundation for Innovative Technologies of the Future	18 Re-defining the User Experience	19 Finding the Balance: Wireless Cities for Long-Term Success rather than Short-Term Hype	20 Implementing a Free Wi-Fi Model and Integrating Next Generation Technologies
	Presenter	Leonard Scott MIS Business Unit Manager	Uwe Lange CEO	Gabriel Vizzard CEO and Director	Ian Bayly European Sales Director	Thomas Jelle Managing Director
	Organisation	City of Corpus Christi, Texas	PPMnet, Berlin	LastMile Communications	Motorola Networks & Enterprise	Wireless Trondheim
	Comments	Leading & well established WiFi network	Train information & management	User experience survey & statistics	Wireless technology & systems appraisal	University Student Focussed Network
Purpose	Internal	eGov				
	Community	eGov	eGov			eGov + Free Access
	Business	SOHO, SME				
Funding	Public / PPP	PPP Earthlink	PPP			PPP - control by Trondheim
	State Aid					
Status	Planned / Live	Live	2007			Live – focus on University
	Wireless / Fixed	Wireless	Wireless Fibre			Wireless
Functional Application	Community Safety	Tested	At stations			
	Traffic Manage	Meter reading				
	Transport		Train information			
	Housing Repairs	Building inspection	Property management			
	Social Care					
	Education	Schools, higher education				Campus
	Emergency Services	Health				Content Partners
	Other	6 more apps in planning				

LIVE NETWORK	PLANNED NETWORK
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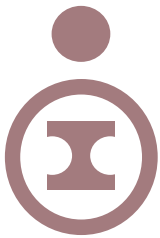
	Title	21 Issues of Public Safety: Using Wireless to Enable Faster Response Times and Reduced Costs	22 Service-oriented mesh networks - A sustainable approach to mesh networking	23 Setting up a Wireless Hospital in Oulu	24 The Transformation Challenge: Broadband Services in Turkey in General and In Public Sector in Particular	25 Getting Support to Further Extend Wireless Applications towards More ROI
	Presenter	Tom Clemo Fire Captain	Paolo Buccioli Assistant Researcher	Arto Lamberg Service Director	Professor Erdal Panayirci Head, Electronics Eng Dept Ayse Kurt TTA	Kevin Goad Director of Wireless and Head of Parking Operations
	Organisation	Medford, Oregon	Politecnico di Torino	City of Oulu, Finland	Kadir Has University, Istanbul	Westminster City Council London
	Comments	Established Fire Service (Police) network	Mesh networking appraisal	Medical applications	Turkish Telecomms Authority	BT Wireless City
Purpose	Internal	eGov		Hospital		eGov
	Community			Patients + visitors		eGov + visitors
	Business					
Funding	Public / PPP	Public		Public		PPP BT
	State Aid					
Status	Planned / Live	Live		Live		2007
	Wireless / Fixed	Wireless		Wireless	Broadband in Turkey	Wireless
Functional Application	Community Safety	CCTV				CCTV
	Traffic Manage	Geo Location				
	Transport					
	Housing Repairs					
	Social Care			Hospital		
	Education					
	Emergency Services	Fire Police		Hospital		
	Other	Maps		Medical applications		Neighbourhood Portal

LIVE NETWORK **PLANNED NETWORK**



	Title	26 FON: the largest WiFi network in the world	27 A New Era of Wireless Enabled Competition: Emerging Cities in Greece	28 Planning Municipal Wireless Networks
	Presenter	Jean Bernard Magescas	Evaggelos Kavvalos	Robert Blackwell
	Organisation	FON	Municipality of Amarooussion	Vertex
	Comments	Innovative WiFi sharing model	ICT skills development + ICT tool	Guide to network planning & applications
Purpose	Internal		eGov	
	Community		eGov Portal	
	Business			
Funding	Public / PPP			
	State Aid		EU Funding – see Prague	
Status	Planned / Live		Phased 2007 onwards	
	Wireless / Fixed		Wireless Fibre	
Functional Application	Community Safety			
	Traffic Manage			
	Transport			
	Housing Repairs			
	Social Care			
	Education			
	Emergency Services			
	Other		Research & Tech Partners	

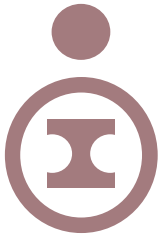
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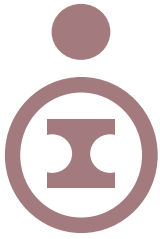
5 GLOSSARY

The analysis uses a number of abbreviations and acronyms that are explained here in alphabetical order.

- **apps** – applications meaning the software applications that provide functionality to users of the network
- **BT** – British Telecom, the UK telco that creates wireless networks in UK cities under a PPP relationship
- **Building inspection** – local Government application to assist building inspectors to do their information management work on site and avoiding the time consuming activity of returning to the office to do it
- **Campus** – normally refers to a University campus where the network is provided to the student community
- **CCTV** – Close Circuit TeleVision where the CCTV equipment is normally mounted in the street on street furniture such as lampposts and enable monitoring of activity for public safety purposes. This approach can also be used for parking and traffic purposes where violations, including car drivers using bus lanes, can be automatically recorded and linked to automated applications to issue fines.
- **Clinical Apps** – clinical applications meaning the software applications that medical staff will use in the course of their work and enable the more effective use of their time by having access to the necessary applications when they are undertaking their duties with the patient
- **Content Partners** – those organisations that provide the web based information known as Content. This can involve a huge range of static, regularly updated and dynamic information to populate web pages being viewed by users
- **Earthlink** – the US based wireless network service provider
- **EC Issues** – **see Prague**. This refers to EC Issues, as above, and the judgement made in the case of the City of Prague and the limitations put on it in the use of its free network services
- **EC Issues** – this refers to the European Commission and its role in investigation issues concerning the use of public funds where anti-competitive behaviour is alleged. See the section on State Aid section in this report
- **EC ruling – Not permitted** – this network is only allowed to provide eGov information on the free basis decided by the municipality. The use of this free access for other purposes such as the world wide web and for businesses is not a permitted development based on an EC ruling
- **eGov** – this refers to e-Government, that is the e (electronic) way of working regarding Government business whether inward facing (ie Government staff) or outward facing (ie the Community). The term eGov refers, at a minimum, to one or more web sites.
- **eGov + Cheap Access** – refers to the charging policy for accessing the eGov information services. Cheap Access means that access is subsidised in relation to normal internet charges
- **eGov + Free Access** – refers to the charging policy for accessing the eGov information services. Free Access means that access is subsidised entirely. State Aid rules indicate that this can only be done regarding the provision of eGov information services
- **eGov + visitors** – means the provision of eGov information to visitors to the locality and normally through suitable equipment such as Kiosks (touch screen PCs running a web browser)
- **eGov Portal** – eGov can extend to a Portal which is a more extensive and sophisticated web infrastructure that can support information provision, information exchange and a range of transactions involving information exchange including financial transactions where items are ordered and paid for through secure services provided by the Portal.



- **Elderly Care TV SMS MMS** – applications to assist those involved with the provision of care for the elderly to ensure social inclusion. This includes an application to display mobile SMS and MMS to their TV sets.
- **Fibre** – optical fibre which offers practically unlimited bandwidth for fixed broadband networks. It has major performance advantages over traditional copper lines but there are substantial costs of laying fibre
- **Fire** – applications to serve the fire department in the course of their duty while in the fire engine and at the scene of incidents
- **Free Access + visitors** – free access is to communities and visitors has to be restricted to eGov information services. A more general ability to access information on the world wide web will lead to EC State Aid issues.
- **Free eGov + visitors** – as per Free Access + visitors
- **Geo Location** – using GPS (Global Position Sensing) technology (as used in Satellite Navigation 'Sat Nav')
- **Health** – applications to serve the health industry including home visits and hospitals in the course of their duty while attending to patients
- **Hospital** – applications to serve hospital staff in the course of their duty while attending to patients and providing internet services to patients
- **Learning tools** – web based tools for pupils and students in schools and further education
- **Live** – those networks (the majority) that are of operational status and many with plans to develop further services in the community
- **Maps** – the provision of mapping information as navigational assistance to members of the community, visitors and emergency services
- Medical applications
- **Meter reading** – applications to serve meter reading staff in the course of their duty
- **Mobile Internet** – the use of mobile phone networks to fixed / nomadic / mobile needs. This is done using GPRS (2.5G) and UMTS (3G) services that support the Internet Protocol (IP)
- **Mobile Working** – a way of working that makes use of mobile technology, predominantly WiFi in the presentations, that enables local government to make more effective use of the time of staff in their work in the community
- **Neighbourhood Portal** – a type of portal that is specifically designed for the provision of information and services for neighbourhood purposes. Please refer to eGov Portal for a description of Portal
- **Not permitted (EC ruling)** – see EC ruling (Not permitted)
- **Patient Monitor** – an application to monitor patients, gather information and transmit alarms
- **Patients + visitors** – the provision of web services to patients in hospitals and visitors
- **Police** – applications to serve the police department in the course of their duty while in their vehicles and at the scene of incidents
- **Portal Multiple Service Prov(ision)** – this concerns a Portal (see 'eGov Portal' for Portal description) where multiple service providers are involved in the delivery of information
- **PPP (Public / PPP)** – Public Private Partnership is an arrangement where the provision of a network is by a telco or service provider and the local authority pays for services to run on it
- **Property management** – a housing repairs related application for staff involved with property management
- **Public (Public / PPP)** – where the provision of the network is by the local authority
- **Research & Tech Partners** – the involvement of research and technology partners in the project, making use of their expertise, their networks and value added services.
- **Schools, higher education** – networks and applications that cater for the education sector and pupils and students in schools and higher education
- **Social housing access** – networks and applications that provide services to those in social housing who have difficulty affording commercial services.



- **SOHO, SME** – entry level business organisations including individuals known as Small Office Home Office and Small to Medium Enterprise
- **The Cloud** – a network service provider addressing the European market that creates wireless networks in cities under a PPP relationship
- **Train information** – as for 'Transport information' trains but specifically for trains
- **Transport information** – applications to assist travellers and those operating transport systems such as buses and trains.
- **Visually impaired** – accommodation in the network devices and applications to assist use by those with visual impairment
- **WiFi** – Wireless Fidelity, IEEE 802.11 predominates for the networks. There are successive variants (now up to 11n) offering better performance. Unlicensed spectrum is appropriately used for this access technology.
- **WiMAX** – Worldwide Interoperability for Microwave Access, IEEE 802.16 in fixed flavour '16d' and mobile '16e'. The latter is becoming the standard as it can be used to support fixed / nomadic / mobile. Licensed spectrum is favoured for this wide area and access technology.
- **Wireless** – see WiFi and WiMAX