

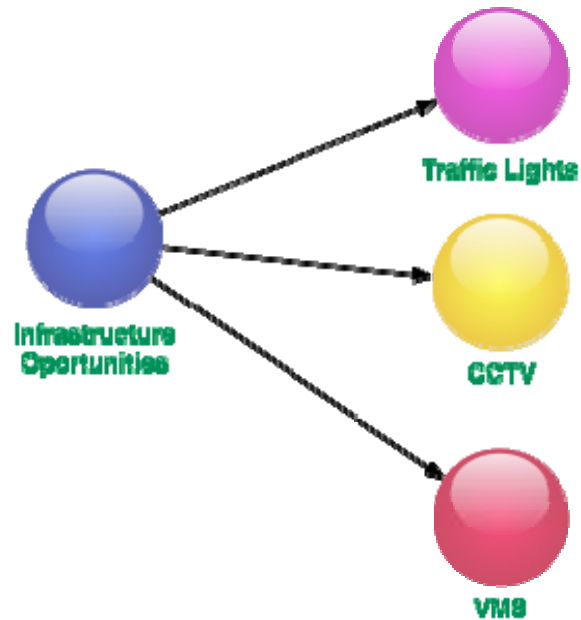
More UTMC for Less Revenue



Councils can use Traffic and CCTV systems to provide infrastructure which can be used for a wide range of additional services without additional revenue costs.

Mesh4g is being used in more than 21 cities.

Legacy Infrastructure



- Old communications technology
- Expensive Revenue
- Opportunity to convert to New Technology
- Provide free ride for new applications not previously possible without their own infrastructure.

Available Infrastructure



Traffic Lights

Bus Stops

CCTV

VMS Signs

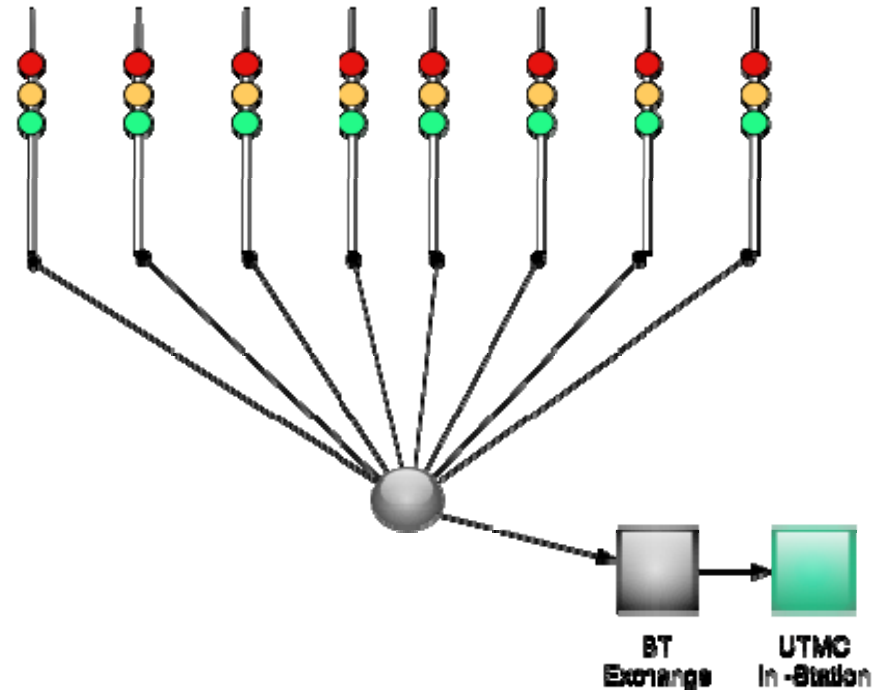
ANPR



EPS 42 Legacy Infrastructure

- EPS42 and Analogue circuits terminated by BT
- EU and Road Traffic Act Driving requirements for more intervention and innovation
- New designs require TCP/IP which is expensive to implement
- Wireless allows expensive TCP/IP connections to be shared among many traffic lights

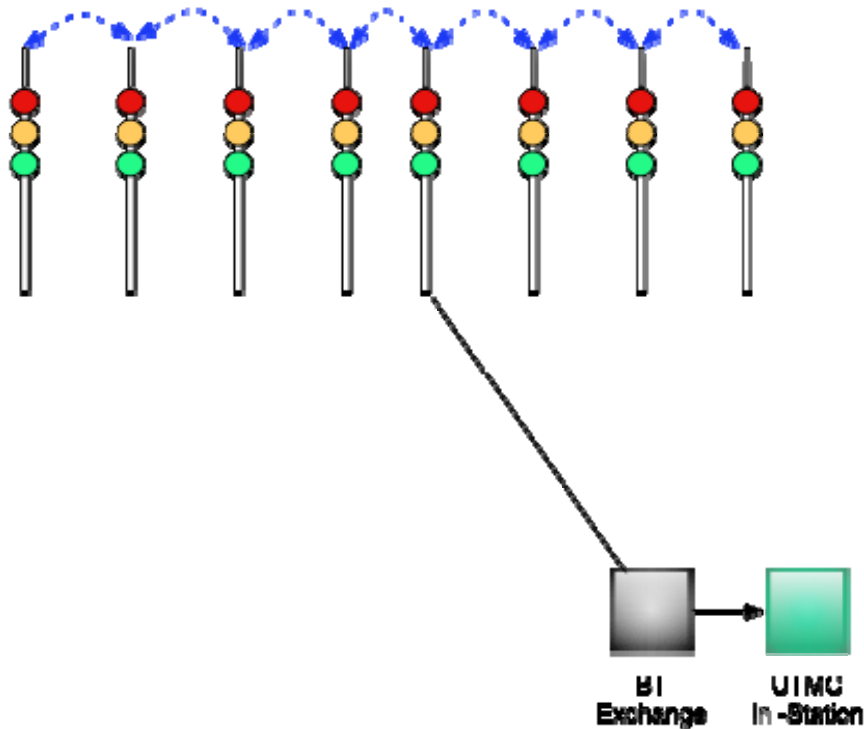
EPS 42 Circuit



EPS 42 circuits set to disappear

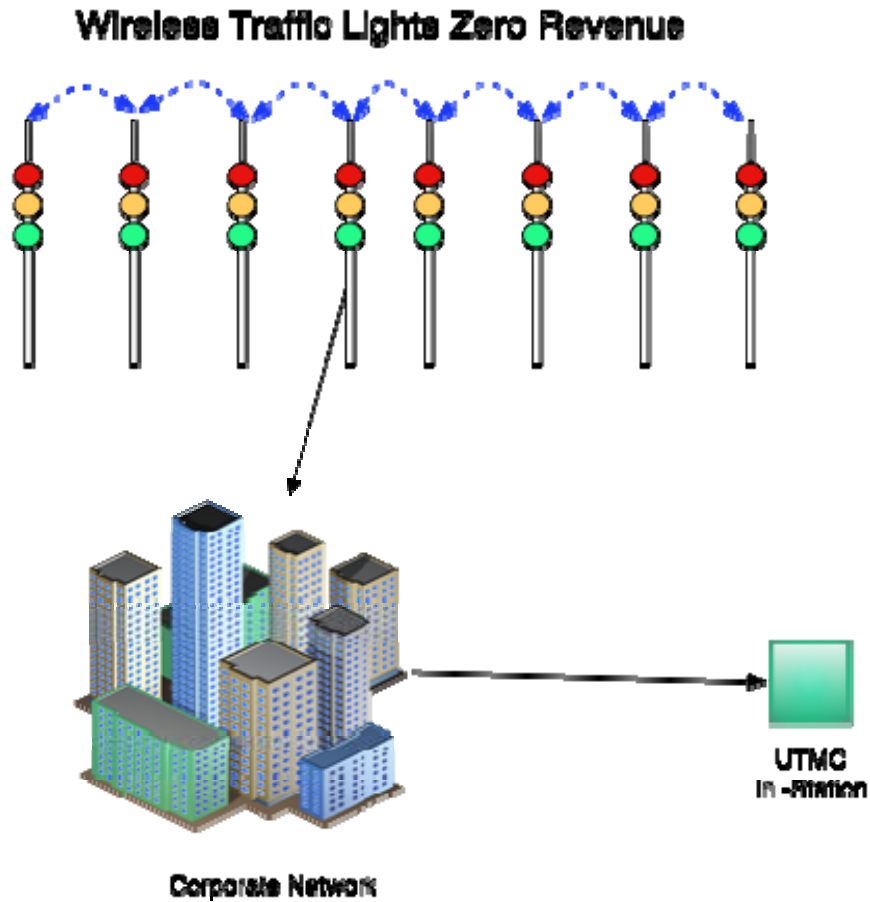
Replacing With Single BT Circuit

Wireless Traffic Lights



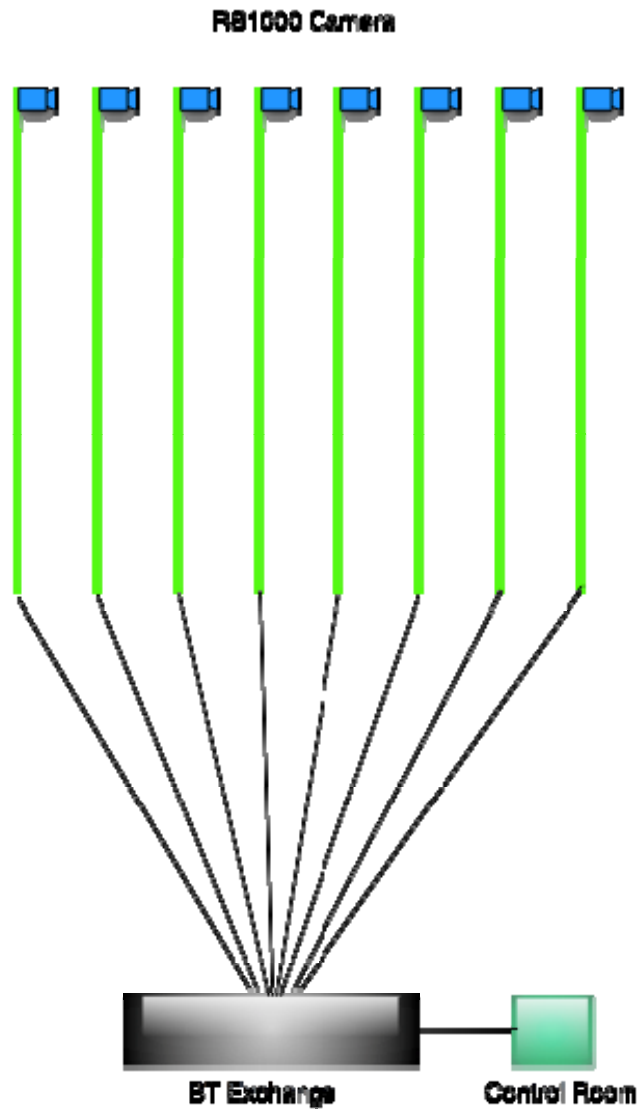
- BT circuits connect to an Access Point (AP) in the middle of a string of lights
- For resilience further nodes can be connected but in dense deployment this will happen automatically
- Radios deployed at the 3m to 4m provide speeds of up to 2Mbps
- Radios deployed at the 10m / lamp column height have speeds up to 100Mbps
- Radios deployed at 30m / roof-tops have speeds up to 300Mbps
- Gigabit speeds are also available for short hauls of less than 5Km

Using Corporate Network - Zero Revenue



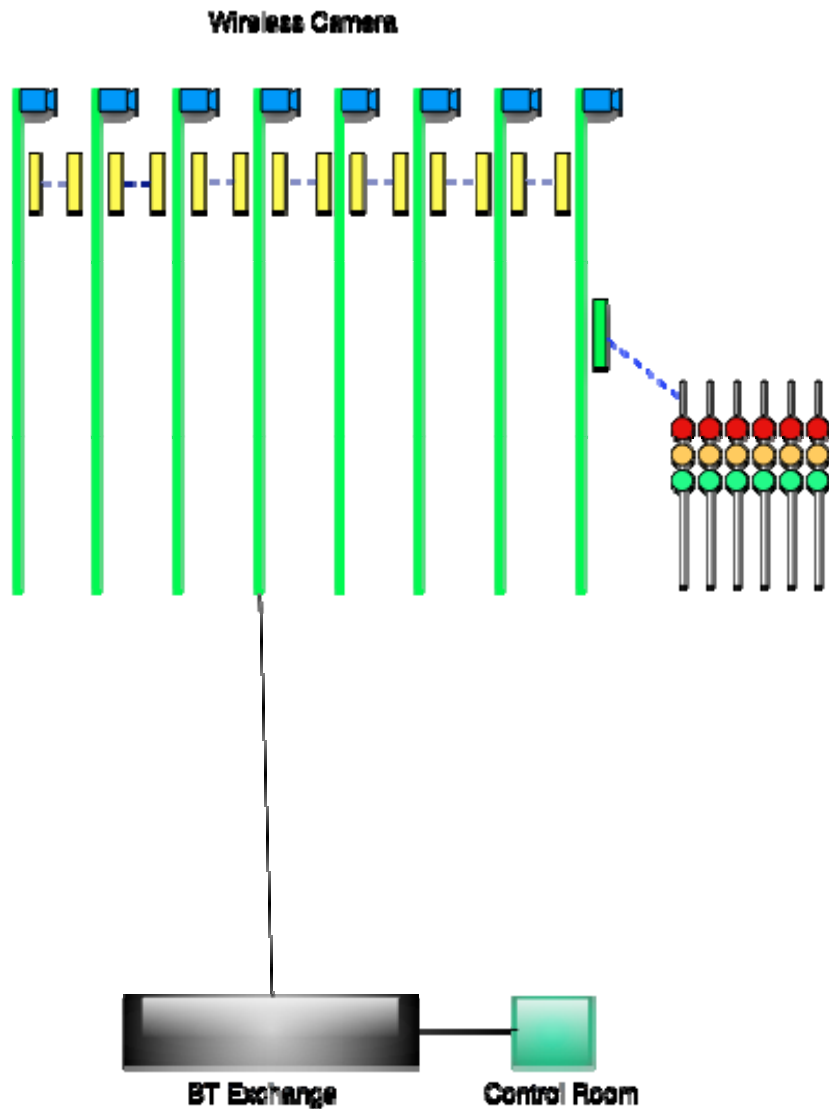
- Use of Corporate Networks or existing connections allows for Revenue free communications
- Several Cities have such systems

CCTV with RS1000



- Fibre connected analogue cameras
- New Ofcom price rise
- Connection cost high
- Long line rental terms
- Difficult to move

Replacing with Single BT Circuit

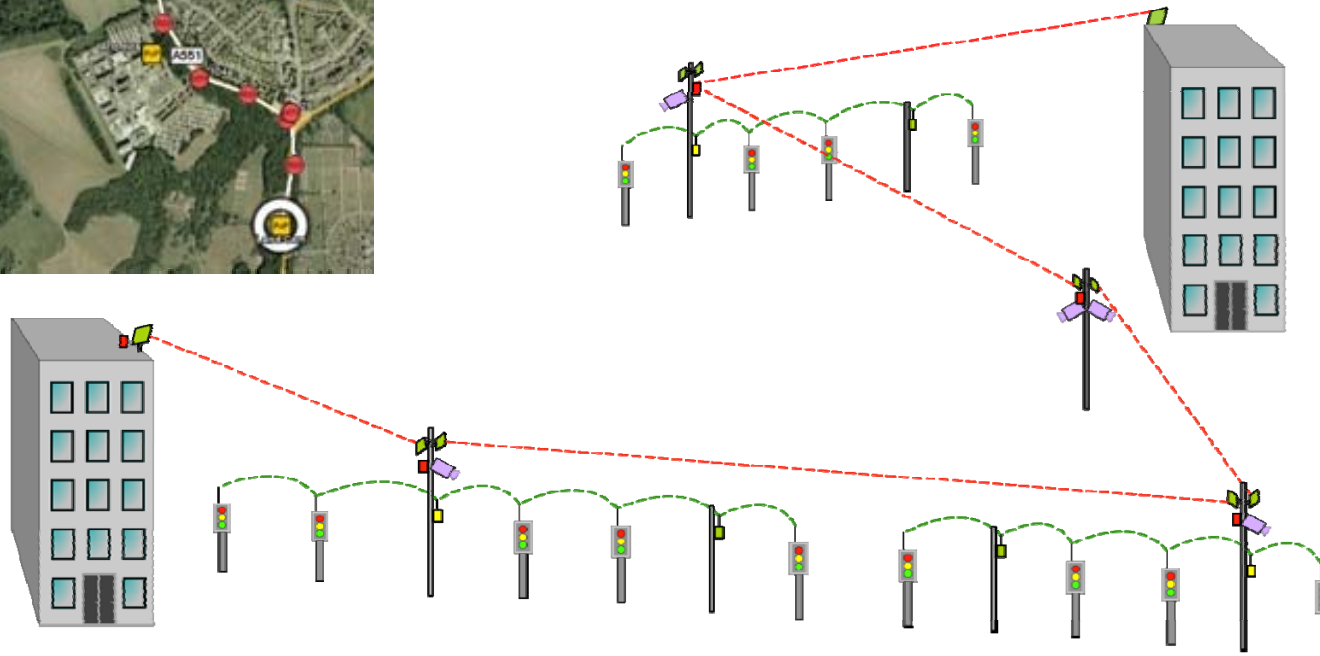


- With a wireless connection groups of CCTV can be connected by a single or multiple circuits
- Back hauls can be via BT or Corporate Infrastructure
- Cameras can be low cost (£1500), Legacy analogue with codecs in the radio or new digital 360 degree cameras
- Radios support throughputs of 100Mbps
- Normal Traffic cameras require 1mbps; Highways Agency require 4mbps; while criminal justice requires 4-5Mbps

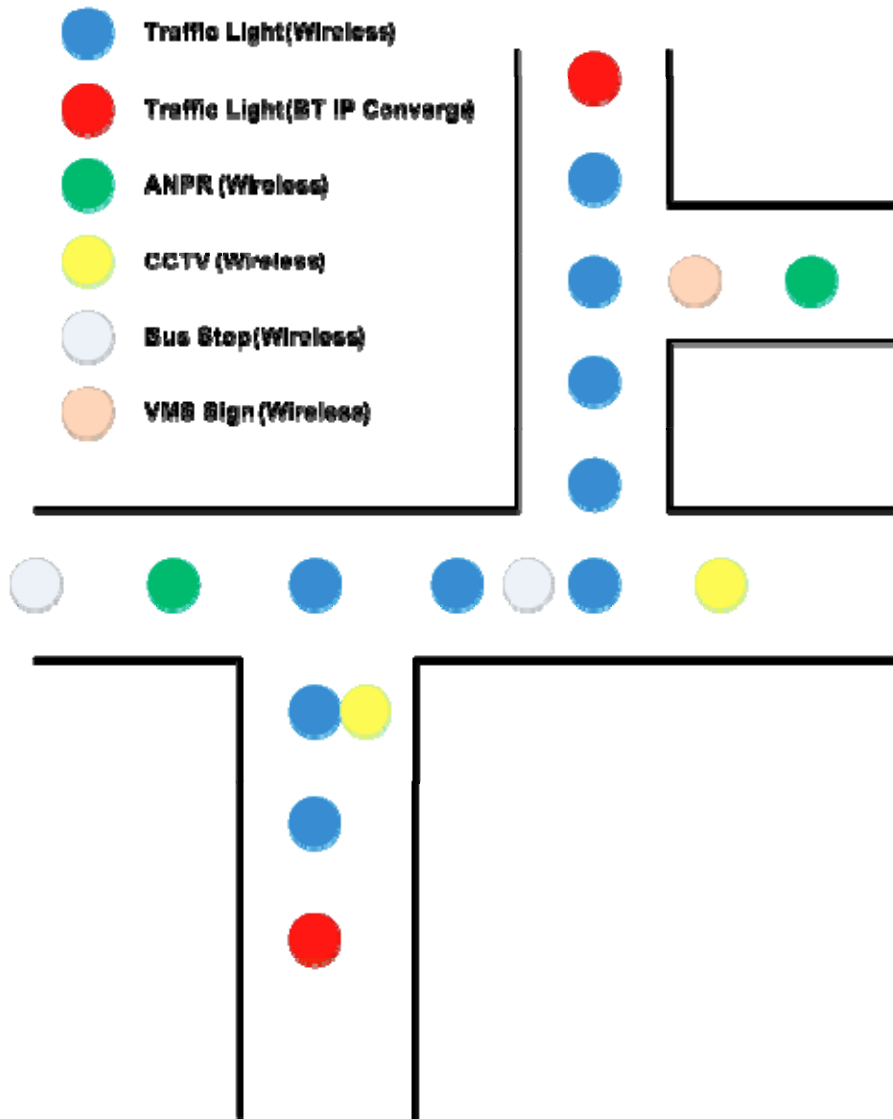
Building the Network



- More complex networks start to emerge as the Mesh4G is expanded with additional nodes
- There is no need to have a big bang. Gradual replacement or upgrade of clusters is viable
- In this diagram these points are all council buildings and so no additional circuits are needed



Wireless Traffic Lights lead to Wireless Cities

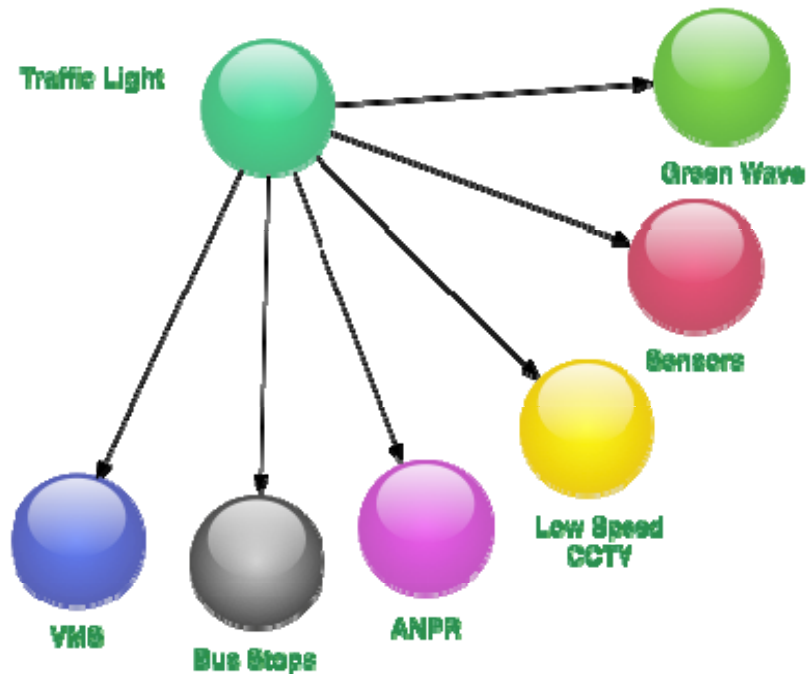


- Automatic network formation – route and frequency of data transmission automatically changes to give consistently reliable communications
- Mesh4G™ radios provide communications to different applications and are specifically configured to route data to their respective servers
- Multiple IP Converge circuits provide greater resilience
- All on-street IP-based applications are supported – UTMC traffic lights, VMS signs, bus stops, CCTV & ANPR cameras
- Both Peek & Siemens traffic light control systems are supported
- This solution will support any combination of services, e.g. collision avoidance, pollution monitoring, road user charging

It's easy to install

- Once a basic network is installed new devices can be added to the road network without any additional infrastructure costs
- The network is self-healing and is monitored 24/7
- Faults can be fixed in 15 minutes and the network is capable of growing to more than 100,000 devices
- The network can grow to new services such as the roadside part of collision avoidance and information delivery

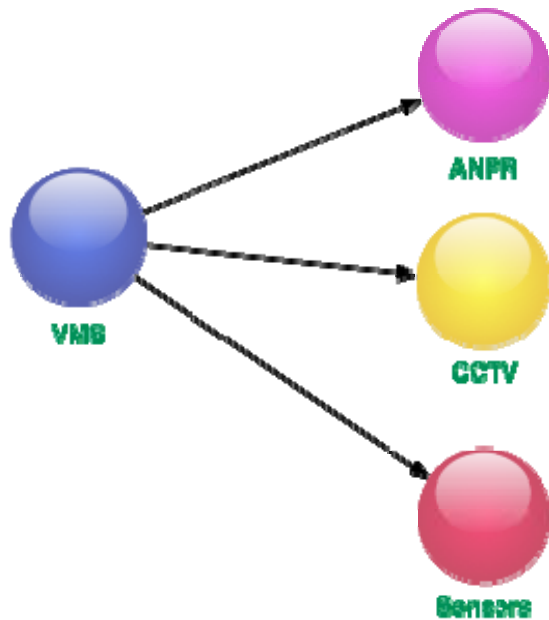
Traffic Light Extensions



Traffic Lights provide a base infrastructure which then allows easy expansion to other services such as:

- VMS - upgrading to Mesh4G removes revenue cost and expands uses
- Bus Stop - allows extension to Information services and safe Zones
- ANPR
- Low Speed CCTV
- Sensors
- Green Wave

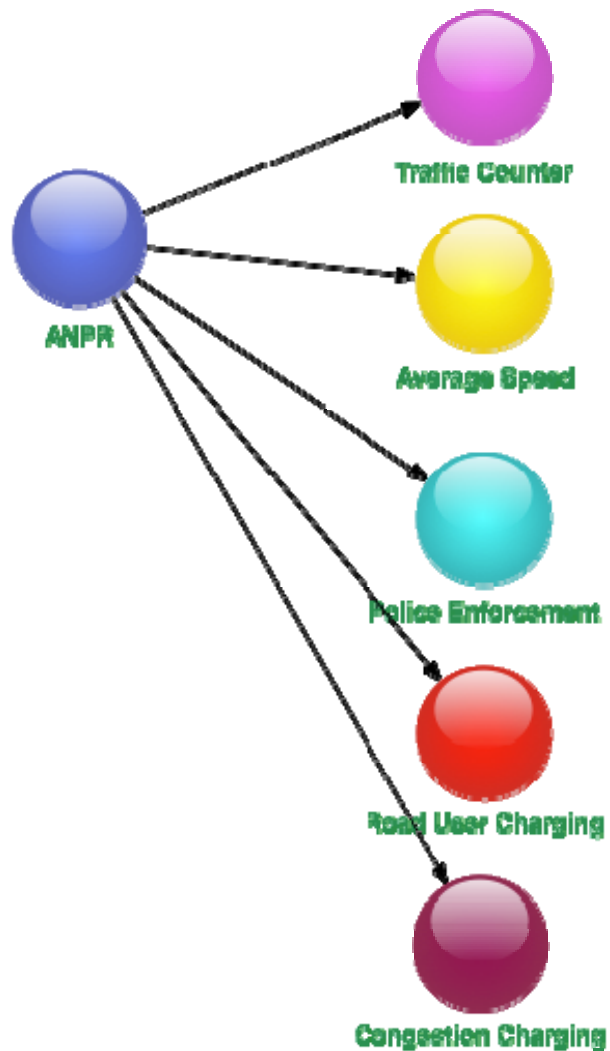
VMS



VMS signs are tall structures which have not been used generally for anything other than message display. Use of high speed networks provides additional use such as:

- ANPR
- CCTV
- Sensors

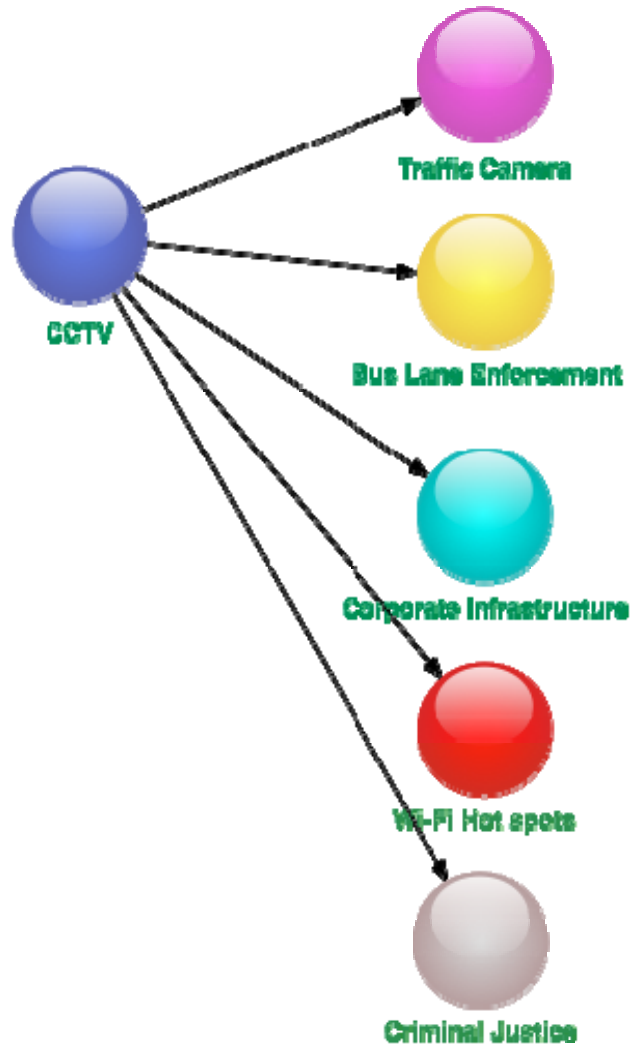
ANPR



ANPR installation enables a number of potential applications, such as:

- Traffic Counters
- Average Speed
- Police Enforcement
- Road User Charging
- Congestion Charging

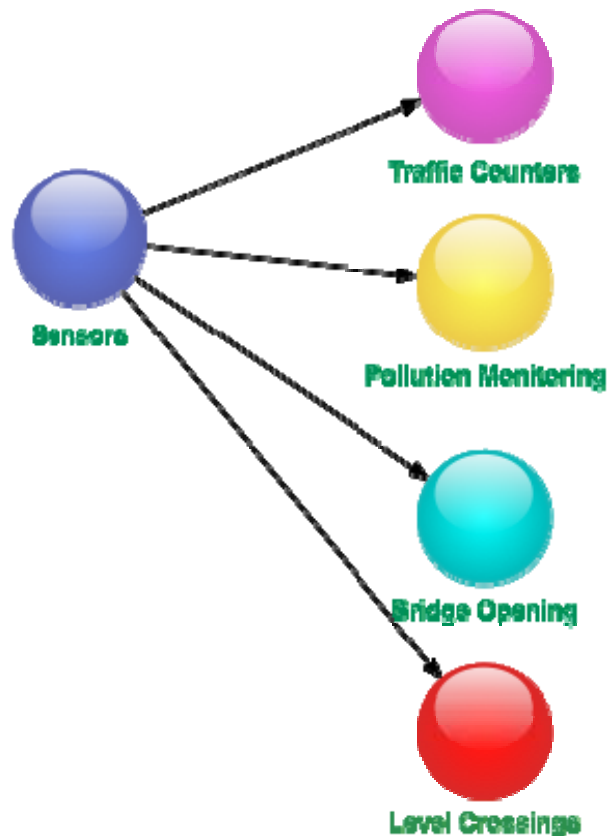
CCTV



Wireless CCTV using up to 100Mbps connections can provide additional services such as:

- Bus Lane enforcement
- Corporate Infrastructure
- Wi-Fi Host Spots
- Criminal Justice CCTV

Sensors

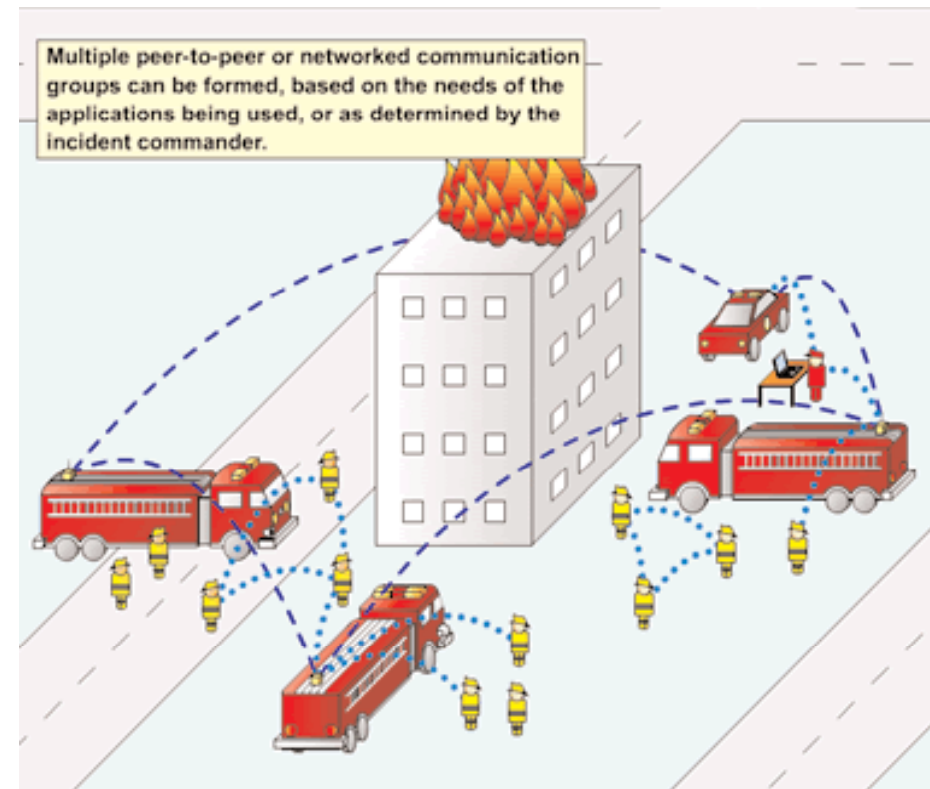


Sensors are devices that measure events and feed into the UTMC database

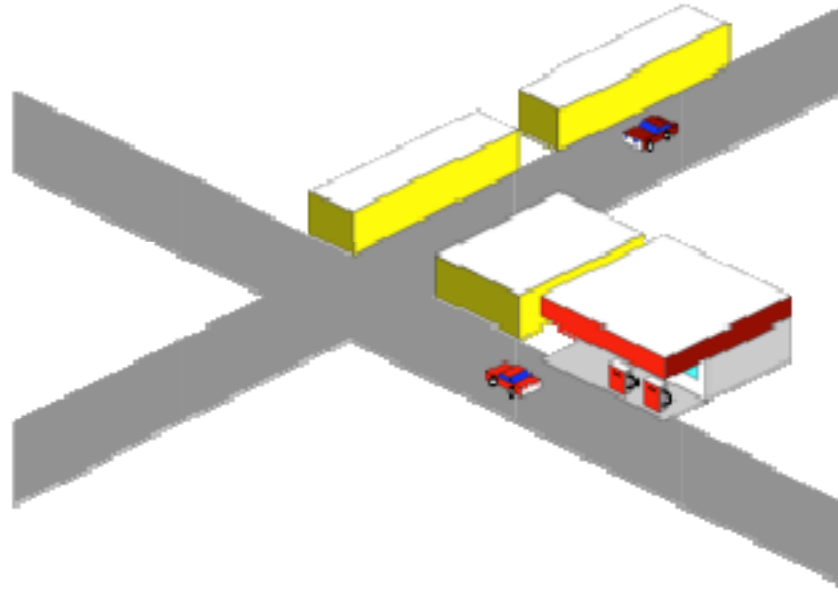
- Traffic Counters using overhead detectors, loops or ANPR
- Pollution Monitoring to move traffic from the centre
- Bridge Opening to divert traffic using VMS
- Level Crossings to divert traffic to alternative routes

Emergency Services

- Emergency Services can use infrastructure to manage incidents
- Radios operate at speeds of more than 200mph giving a 2mbps real time data feed
- Radios use Military encryption to Fips 140-2 with hardware authentication
- QCMR technology can change channels and direction every packet.



Emergency Vehicle Green Wave



Two vehicles approach an intersection, one is an emergency response vehicle. With collision avoidance the emergency vehicle would broadcast its location and stop other vehicles crossing the intersection. This requires the information on the emergency vehicle to be relayed to all the vehicles outside of its direct radio line of sight.

Future Proof

- Mesh4G is deployed in 21 cities across the UK with more than 2500 nodes installed on-street
- These networks can be easily upgraded to support a higher throughput if required
- Networks are easily expandable to increase network coverage or include new services:
 - Road user charging
 - Collision avoidance
 - Pollution monitoring
 - Bridge and level crossing input
- Up to 100,000 nodes can be supported in each system
- Due to the client-based nature of the wireless each node added to the system increases the system's capacity
- GPRS/3G nodes can be integrated into network

NOW Wireless allows
more UTMC for less