THE EVOLVING BENEFITS OF MOBILE CONNECTIVITY



Mobile Evolution

1.1 Mobile networks in the UK were born through the Telecommunications Act 1984 and over the last thirty years have grown and developed into a very different species from their first manifestation in the mid 1980's. Referenced by generation, it is not always easy for the lay person to decipher the evolutionary process that has taken place and which continues. It is however important to understand this to appreciate the considerable and growing benefits of mobile connectivity.

1.2 The deployment of the **First Generation (1G)** mobile networks commenced in the mid-1980s and these networks have long been superseded.



1.3 1G services were voice telephone only and users will recall large handsets with large battery packs that still only lasted minutes to provide generally poor quality analogue calls with little confidence of being able to complete the call.

1.4 The **Second Generation (2G)** mobile networks were launched in the early/mid 1990s and provided mainly voice and text services.



1.5 2G used digital technology so call quality improved and handsets reduced in size. These networks are now also largely superseded and in the process of being closed down.

1.6 The **Third Generation (3G)** mobile networks were launched in the early 2000s and have been enhanced to provide fast broadband speeds that can handle the full spectrum of media services, e.g. internet connections with online and real time streaming of visual media and a range of safety, information, educational and entertainment applications.



1.7 The 3G networks are now being enhanced to the **Fourth Generation (4G)**, which operates at superfast broadband speeds, allowing a far greater range of data hungry applications, such as streaming High Definition visual media.



1.8 It was the 3G networks that were first able to support a range of devices that went beyond a simple voice and text handset, to smart phones, tablets, netbooks, laptops, e-readers, satellite navigation systems and a host of gaming devices. These are being greatly enhanced through the current deployment of 4G networks, which are becoming available on a widespread basis.

1.9 Public demands and service expectations have also grown immeasurably as the handset manufacturers and software engineers produce an increasing array of innovative devices and services. According to the latest OFCOM Communications Market Report 2015:

- There are almost 90 million mobile subscriptions in the UK
- Of these 23.6 million are for 4G services.
- Two thirds of people now own a smartphone
- A third of internet users see their smartphone as the most important device for going on line – which now exceeds those who mainly use their laptop.

1.10 The increasing range of devices and applications that can now be supported by the mobile networks has in turn increased the considerable benefits associated with mobile communications and the importance of them. In its May 2013 update, 'The availability of communications services in the UK', Ofcom summarised the importance of access to communications in the following terms:

> *"3.2 Communications services provide people with access to political, educational and cultural activities and resources. The availability of such services matters because a lack of availability results in reduced (or non-existent) access to such resources. Reduced access can be compounded, typically in rural and remote areas, by a lack of other public services, such as libraries or public transport.*
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> *3.3 Access to communications services provides benefits to both individuals (for example, by providing the means to stay in touch with friends and family), businesses (for instance as a means to engage with suppliers and customers) and society as a whole (for example, by providing educational resources that result in a more skilled and informed population). The development of digital communications services and the movement into the digital age have made communications services an increasingly integral part of our daily lives. The UK Government estimated "the typical British consumer spends nearly half of their waking hours engaged in one form or another with the products and services of the communications sector." Digital communications services are used increasingly to participate in civil society, to learn and develop, to keep in touch, to share information and for entertainment, among other activities. The increasing integration of digital communications services within daily life has resulted in both an increase in the scale and significance of their associated benefits and the implication that increasingly fewer adequate substitutes are available to those who do not access them."*

1.11 The importance of mobile services was also borne out in more recent Ofcom research in 'Consumer Views on the Importance of Communications Services and their Affordability' (July 2014), which highlighted the following:

- *"Mobile services are now seen as essential or important for most consumers to access voice calls and text-based communication, except for older consumers who continue to rely on landline for voice services.*
- *The way that people communicate with each other has changed significantly in the last ten years.*
- *Over nine in ten adults now have a mobile phone, using it for voice and text and, increasingly, instant messages and other internet communication.*
- *More recently, smartphone ownership and use of internet on the go has increased rapidly, with just over half of UK adults owning a smartphone in 2013."*

1.12 A particular feature of the way in which mobile networks have evolved is their scalability and in turn therefore benefits associated with the necessary infrastructure have increased over time. From past experience, each mobile generation lasts about ten years, before it starts to be replaced by the next generation, but the network architecture is generally based upon the outgoing generation. This is because the principal requirements remain the same, i.e. base stations that require antennas supported by high supporting structures, along with radio equipment housing.

1.13 One can therefore forecast with a degree of certainty that an installation permitted today for the current generation of services, will be scalable into the next generations of services. In turn the additional services and benefits that increase with each generation are guaranteed to those localities which host such installations.

1.14 It would not be possible to list all the benefits associated with mobile connectivity, but a number are highlighted below under sub – headings:

Improving Public Safety

- According to OFCOM about two thirds of emergency calls in the UK, including requests for Coastguard assistance and Mountain Rescue are now made using mobile phones.



- On an average day in the UK 7 or 8 people are killed on our roads. A far greater number are saved from fatal or permanent injury through prompt paramedical assistance in the critical early period following an accident. This is made possible by emergency calls placed almost immediately following an accident.

- The emergency services can locate a victim with a mobile phone in a remote area via a system known as Enhanced Information Service for Emergency Calls and/or through the aid of common applications such as Find my Phone or Find my Friends.

- Ambulances sent to heart attack victims will often carry a connected ECG machine, which enables the crew to send back images of a victims heart to the emergency cardiology unit. They can then assess whether the victim needs surgery to unblock an artery and if so direct the ambulance to the nearest hospital with that capability. The crew can also be given life-saving instructions and the receiving hospital can make its pre-operative preparations.

- Emergency defibrillators now often found in public places require the user to use a mobile phone to gain an access code.

- Mobile phones can be used to summons assistance from the breakdown services in the secure environment of a locked car. This is particularly important to the vulnerable.



- Almost every disaster plan held by the emergency services, central and local Government services and the utilities, as examples, will have amongst its first set of actions a group text to all potential responders. This saves considerable time on dialling up people on a long list.

- The other side of this is that first responders, who might also include retained firemen, on call doctors, nurses and vets, often need mobile coverage so they can be called upon if required.

Economic Benefits

- In March 2015, an independent report was published by RAND Europe *"Estimating the value of mobile telephony in mobile network not-spots",* commissioned by the DCMS. The report looked at the impact of no network coverage on different rural population segments and had several key findings which support the need for extending mobile coverage:
    - A lack of mobile phone signal impacts rural businesses. Almost half of those asked said it had a negative impact on profit, turnover and productivity
    - Local residents and visitors are willing to pay for better mobile coverage. The further people have to travel for 2G signal, the greater they are willing to pay for local services
    - Among both residents and businesses, a key reason for having a mobile phone is to deal with emergencies
    - Availability of mobile services may affect the long term sustainability of rural communities. Mobile coverage could be an important factor in ensuring the diversity of rural economies
- Mobile communications, especially high speeds can help extend business opportunities into peripheral areas, both directly and indirectly.

- In rural areas, fast or superfast wireless broadband services are required by farmers who now have to continuously supply to DEFRA a range of online forms.



- An example of a direct benefit would be a business reliant on mobile communications being able to establish within an area, so creating local employment opportunities.

- Indirect benefits might include visitors to the local area being able to search and make reservations or bookings at local restaurants or hotels.

- Local tradesmen and others who provide services such as doctors and vets can provide a more responsive and flexible service, which can save costs.

Improving Social Well - Being

- Mobile communications can help social well – being by simply ending or reducing a sense of isolation.

- Mobile communications can bring about far greater personal convenience and security, for example, teenagers can keep in parental contact when out in the evening.

- Mobile communications provide much greater freedom to carers, who can remain in contact in case of emergency.

- Mobile communications help people remain connected and to access social networking sites, which is especially important for young people.

- Mobile communications can access a range of applications to benefit people's lifestyle and interests.

- Mobile communications help single parents interact with children, for example, a divorced father can play an online game with a son elsewhere.

Encouraging Sustainable Lifestyles

- Mobile phones can help minimise unnecessary journeys, so increasing productivity and reducing travel demands.

- Mobile phones can help facilitate modern forms of working, including greater homeworking. This can bring about an improved balance between home and working life. At the same time, it can help minimise private car movements and so help reduce peak period congestion and pollution. This is a particularly important benefit when transport policy to reduce travel and CO^2 emissions seems to be failing.



1.15 It is hard to quantify these benefits and as mobile now supplies fast and superfast broadband services, it is also hard to separate the contributions that might be attributable between fixed and wireless, i.e. mobile. However, Broadband Delivery UK, part of the Department for Culture Media and Sport did commission a UK Broadband Impact Study and the Impact Report was published in November 2013. A number of the key findings provide some quantitative analysis of the range of benefits highlighted above, i.e.:

- For every £1 of public investment is a projected return of approximately £20 in net economic impact over a 15 year period. (One can assume that a similar impact will accrue from commercial investment).

- Increased teleworking facilitated by faster broadband will save about 60 million hours of leisure time, so improving work/life balance.

- By avoiding commuting costs, the additional teleworking will lead to total household savings rising to £270 million per annum over a 15 year period.

- The availability and use of faster broadband is projected to save over a 15 year period:

    - 2.3 billion kms in annual commuting, predominantly in car usage

    - 5.3 billion kms in annual business travel, predominantly in car usage

    - 1 billion kWh of electricity usage p.a., by firms shifting server capacity onto more energy efficient cloud platforms

- Allowing factors such as increased home heating by teleworkers there is still a projected annual saving of around 1.6 million tonnes of carbon dioxide by the end of the 15 year period.

1.16 These benefits and the potential contribution made through access to mobile services can only be realised through continued investment and deployment of mobile network infrastructure.