

## 1. Telkom's rationale for attaching obligations to spectrum licences

Post licence conversion, there are over 500 ECS/ECNS licensees in South Africa. As espoused in this document, Telkom believes all operators have a responsibility to achieving universal service and access in South Africa, proportional to the revenue associated with their ECS/ECNS licensed activities. Whereas it is axiomatic that all licensees may pay, only a handful of licensees practically have the ability to play, in particular with regards to universal services. This is because the fundamentals of telecommunications show that the last mile (i.e. that which connects the networks to the customers) is a bottleneck asset. This last mile can only be bridged using the following access media:

- Wireless (fixed terrestrial, satellite or mobile), or
- Wireline (copper, fibre)

Historically Telkom attempted to achieve universal service via the 2.7m line roll-out obligation attached to our former PSTS licence, which was unsuccessful. In the end Telkom fell short of the line roll-out obligation by a very small margin of only 16,400 lines. Despite Telkom providing the line at a price below cost, over 2 million customers could not afford the monthly payments and therefore cancelled their service. The key barrier for customers is the line rental cost, which is currently R133 per month.

Wireline and wireless (in particular mobile) are fundamentally different in that the former is a fixed asset and sunk cost dedicated to a single customer. If that customer does not use the line provided, the asset becomes redundant in that it does not generate further revenue, even though Telkom in most cases had not recovered the cost of the line. This is also true for fixed wireless although some of the cost (TCE) can be recovered. This shortfall between the cost of the line and the line rental revenues is known as the access line deficit (ALD). As per Telkom's submissions regarding the call termination regulations, using CCA the ALD currently stands at R8.2 Billion.

The economics of mobile technologies are more favourable in that wireless is a shared medium. A theoretically infinite number of customers may reside or pass through within a base stations footprint. The base station is instead limited by the capacity demands on it – not the number of customers. In the Consultation on Wholesale Mobile Call Termination, OFCOM (the UK regulator) acknowledged as much in Figure 1, which shows how costs correlate with volumes in mobile networks, whereas it is proportional to subscribers in fixed networks.

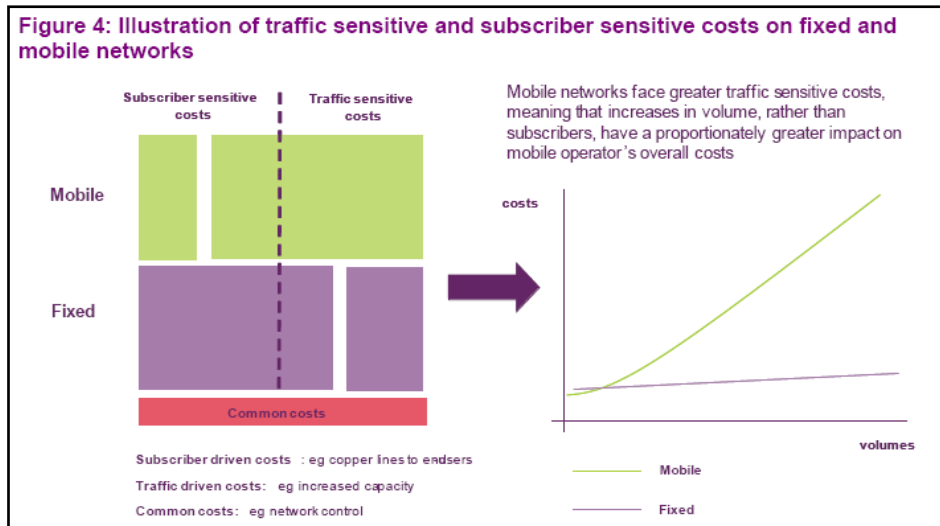


Figure 1: Cost sensitivities of fixed and mobile

Telkom's point is that local loop unbundling (LLU) will in no conceivable manner advance the objectives of universal service or access. Thus any calls for LLU to be implemented such that other licensees may "play" in the universal service market are based on incomplete information and flawed logic. If Telkom were to theoretically provide a wholesale metallic path facility (MPF) product, it would naturally be at fully recovered cost of the copper line. This would imply that a MPF in residential areas would wholesale for no less than R304 (probably more when other charges e.g. line testing, line transfer etc are included).

Telkom contends that in South Africa fixed line technologies are simply unaffordable options when it comes to universal service. Many operators at the Authority's 2010 public hearings on call termination stressed the fact that mobile technologies are cheaper than wireline (copper or fibre) in South Africa. This view is substantiated by several international presentations and papers. This being the case, although in theory every ECS/ECNS licensee may provide a mobile service/build a mobile network, in practice the number of licensees who can do so is limited by access to capital and mobile spectrum. Thus Telkom contends that since universal service and access will only be achieved via wireless technologies, and all such technologies require spectrum – that roll-out obligations should be attached to spectrum only.

## 2. How spectrum and obligations correlate

Currently the Authority deals with each spectrum band in an isolated manner. Such a patchwork approach is bound to leave gaping holes with respect to universal service and access. Table 1 below is a Telkom summary of the various IMT FDD key access bands considering fees and obligations holistically (in that there is a trade-off).

<b>Band</b>	<b>Fees</b>	<b>Obligations</b>
800 MHz (Digital Dividend)	Auction price to be determined. Potential valuation of R1Billion for 20MHz	Unaware of progress in this regard
850 MHz	Unknown	Currently Neotel, USAL's and Broadcasters have allocations in this band. This band falls into the Digital Dividend spectrum. Although the broadcasters are migrating, there appears to be no strategy with respect to the telecoms operators in this band. Neotel has a 50% of specific municipal areas coverage obligation as attached to PSTS licence (for voice).
900 MHz	Current R6.1m p.a. for 11 MHz	Currently no BB obligations attached to spectrum licence; although MTN and Vodacom were expect to cover 70% of the population in 4 years for voice (Cell C 60% within 5 years) as a PLMN licence obligation.
1800 MHz	Current R6.2m p.a. for 12 MHz	The "3G" obligations. Historically PLMN licensees were given simcard and handset obligations. Currently these obligations are been renegotiated, led by the DoC.
2100 MHz	Current R6.5m p.a. for 15 MHz	
2600 MHz	Auction price to be determined	The Authority initiated and then froze the process for auctioning off spectrum in this band. A 50% population coverage obligation was attached to the original ITA.
3500 MHz	Telkom currently pays R86k p.a. for 28 MHz increasing to R21m p.a. under AIP	The Authority initiated and then froze the process for auctioning off spectrum in this band. No obligations attached

Table 1: ITU-R IMT FDD spectrum assignments

Telkom does not wish to comment in detail here on what the coverage obligations should be, or more to the point where they should be, however instead makes the following observation i.e. all obligations start being measured with respect to urban areas. With respect to voice, it is well known that South Africa has near 100%

coverage of population and land, making this obligation superfluous. However with respect to broadband, recent statements by certain operators indicate that South Africa has only 50% 3G coverage.

Figure 2 illustrates approximately the economically efficient coverage (discussed shortly) that can be achieved per IMT FDD frequency band. The figure does not show the actual obligations, or the actual aggregate coverage of operators in South Africa. What is clearly illustrated is how spectrum is “stacked”. Thus in the urban areas (where the population is most dense and the economics most favourable) one can receive coverage on multi-bands. Telkom believes that this “depth in spectrum” is not redundant, however is in fact beneficial in that in future it will allow traffic to be “handed off” between the various bands. This “depth” creates capacity which allows operators to avoid congestion and facilitate higher per user throughputs, which leads to better quality of service. The point Telkom wishes to make is that the Authority should be thinking along these lines. In particular the Authority needs to consider how it intends to meet the objectives of the National Broadband Policy of achieving 100% broadband coverage by 2019. How are the rural areas going to be covered?

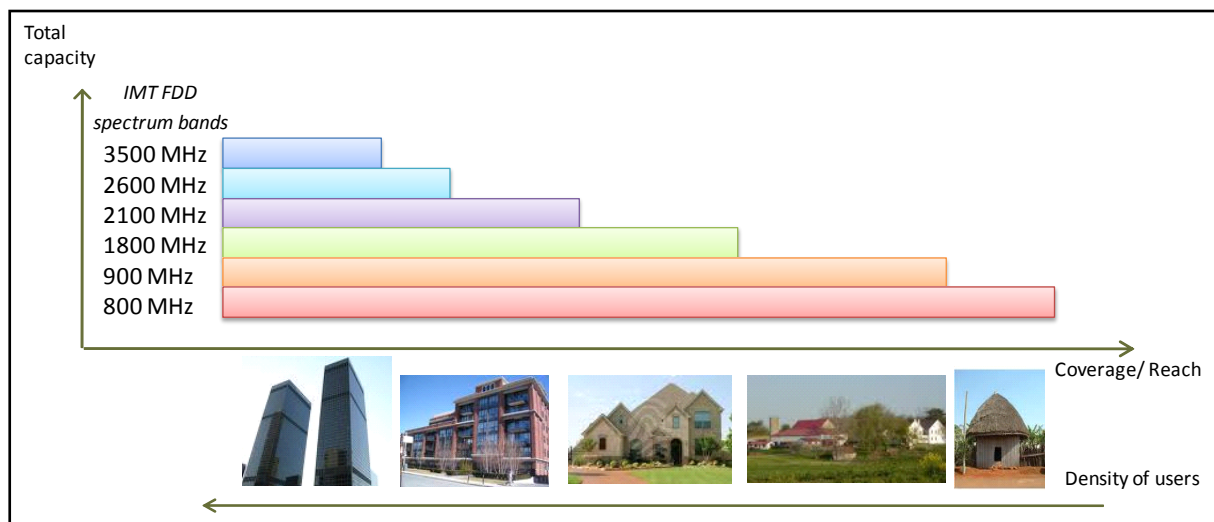


Figure 2: Cost sensitivities of fixed and mobile

Telkom would like to briefly elaborate on the concept of economically efficient spectrum coverage. Figure is a simplified diagram (Source: France Telecom/Orange) of the value of spectrum at different frequency bands.

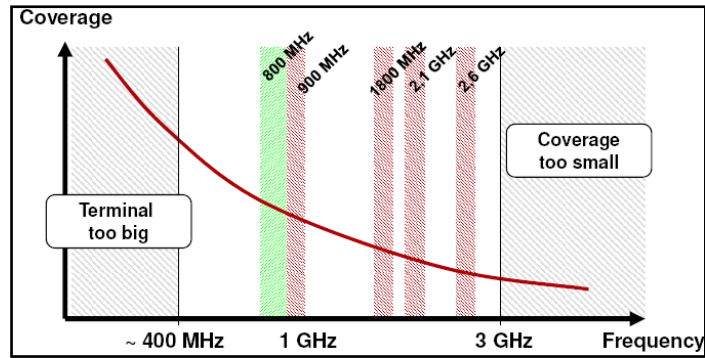


Figure 3: The value of spectrum in providing coverage

Essentially the lower the frequency band, the better the radio propagation characteristics and signal strength for a given antennae size. Thus lower frequencies have higher coverage, which means that a given area can be covered by fewer base stations. Thus the cost of building a network is lower the lower the frequency band. This is clearly illustrated in Figure 4. (Source: GSM Association)

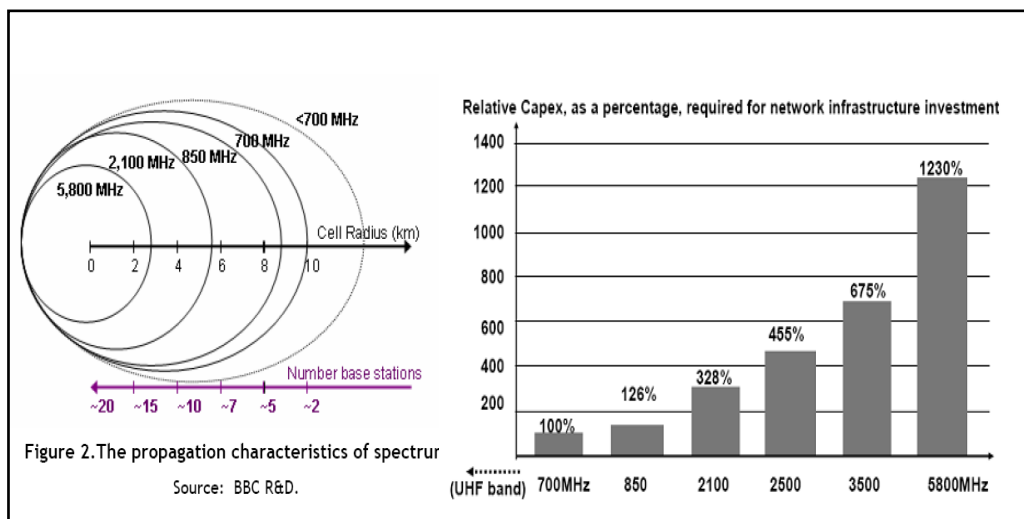


Figure 4: Cost advantage of lower spectrum

The exact numbers vary; however T-Mobile (see Figure 5) claims that it would cost x9 the amount of capital to cover the same area using 2.6 GHz compared to using Digital Dividend spectrum.

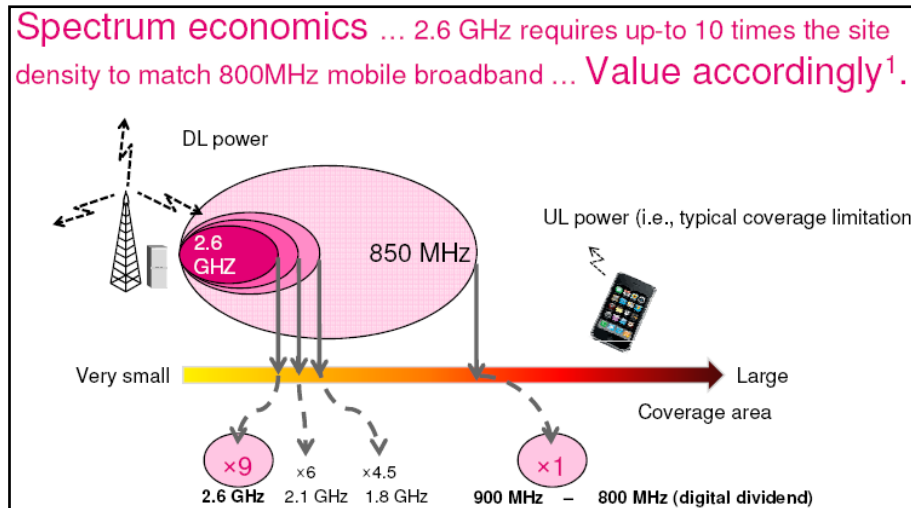


Figure 5: Spectrum Economics (Source: T-Mobile)

Thus, if one has a fixed amount of capital (as both USAASA and operator do) then one would get larger coverage in spending that capital on low frequency mobile networks, than any other network. Telkom has espoused the principle that obligations should only be attached in an economically efficient manner. Thus, to attach obligations above the economically efficient reach of a frequency band (see Figure 2) would be incorrect. Already Telkom is concerned that the 50% coverage obligation attached to the 2.6 GHz ITA is inefficient. Contrast this to the 2100 MHz and 1800 MHz (the “3G” bands) where there is no broadband roll-out obligation. It seems that too much is being attached to the 2.6 GHz band and not enough to 2.1 GHz and 1.8 GHz.

Currently the DoC is renegotiating obligations attached to the 3G bands. Telkom is concerned that whatever obligations are eventually imposed, it will not be within the framework of an overarching universal service framework that we espouse here. For instance, if the 3G obligations are to connect clinics and schools, will such obligations be counted under e-rate or spectrum obligations? The DoC could moot roll-out obligations; however, such obligations may not be economically efficient (in that they would presumably be over and above the 50% 3G coverage already achieved, since if they were less they would have already been met).

Most commentators agree that spectrum below 1 GHz provides the most economically efficient means to roll-out networks. Hence the Authority should seek to target these bands in pursuit of the goal of universal broadband service. The Authority may thus be tempted to attach an onerous e.g. 90% coverage obligation to the Digital Dividend. Telkom is not necessarily saying that this should not be done, however it begs the question of whether having such a large costs associated with one band, and virtually giving away the spectrum in the adjacent 850 MHz and 900 MHz bands is fair and administratively even handed? On top of that, one should

consider the imbalance in spectrum fees where for some frequency bands the AIP formula is applied whereas other bands must be obtained via an auction at a much higher fee. Telkom is hence proposing that licensees in the 850 MHz and 900 MHz bands should share the burden of universal broadband service. This would imply that such licensees have new obligations attached to their spectrum licences, aligned with those obligations attached to the Digital Dividend.

Telkom's end objective is that all spectrum licensees should bear a cost (either through fees and/or obligations) proportional to the value of the spectrum they hold, and the amount of spectrum in the band. Telkom's preference is that the cost be that of a rollout obligation in the lower bands, and predominately fees or access obligations in the higher bands. In this way the Authority is urged to normalize the obligations of all spectrum licensees, and create a framework that does not leave communities and areas unserved.