



GSMA Public Policy Position

# TV White Space

February 2013

## Summary

### Context

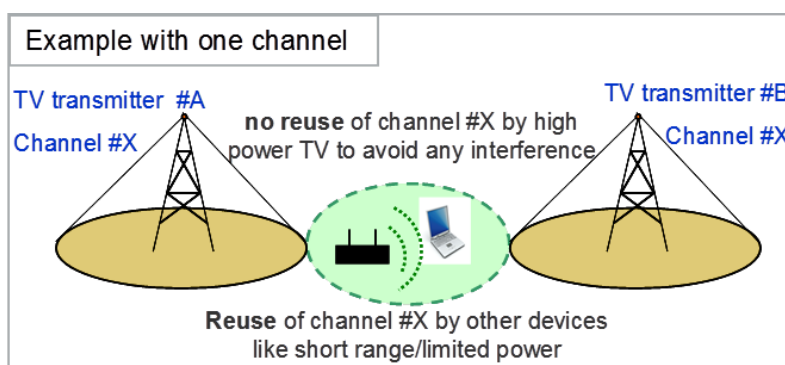
Television broadcasting typically leaves some UHF frequencies idle at certain locations. Known as 'white spaces', these broadcasting gaps are increasingly being considered for alternative uses. In addition to issues of technical feasibility, use of TV white spaces may have implications for the current paradigm of exclusive spectrum licensing. As global demand for spectrum intensifies, new approaches such as this are attracting considerable interest and investigation.

### Position statements

1. It is important to consider how to use the Digital Dividend most effectively to benefit citizens and businesses. The licensing regime should not jeopardize the future of the UHF band, especially in the case of reallocation for exclusive mobile use.
2. The use of TV white spaces must not distort the market through inappropriate regulation. Eliminating the cost of acquiring licensed spectrum and providing cellular-type mobile services could create an unfair advantage.
3. TV white space is currently based on the concept of a spectrum-use database combined with geo-location to the spectrum resource for which quality of service and spectrum availability is not predictable. For TV white space, there is no a priori determination of the spectrum to be eventually accessed.
4. Interference management remains a top priority, and that creates some confidence. The use of TV white spaces, on a secondary unlicensed basis, requires careful interference avoidance towards primary users such as existing TV broadcasters, as well as services in adjacent bands.

## Background

The expression “white spaces” is used to define the parts of the spectrum that are not used at a particular time and geographical location. Typically white spaces, or “TV white spaces,” consist of unused spectrum in the television broadcasting bands (470-790 MHz in Europe and 470-698 MHz in USA). There is unused spectrum mainly because of the geographical separation required between television stations of the same channel and also part of the spectrum dedicated to the regional TV stations which remain unused in certain areas. For example, because of interference, you could not have one Channel 4 station broadcasting from Paris and Channel 4 broadcasting from Versailles. Microsoft is advocating globally for use of the white spaces for license-exempt services (like Wi-Fi). It is worth noting that desirable/potential geographic area, such as major urban and suburban areas, typically have little, if any, TV white space at all. The image below illustrates where white spaces devices could operate.



The TV white space scenario relies on the licence-exempt model with “no individual rights of use” as well as “no individual frequency planning/coordination”. As a consequence, users can only expect best-effort service. TV white spaces are in the television UHF band below 1GHz, often referred to as Golden Spectrum. However, it should be noted that the white space concept is frequency agnostic and could be expanded to any band where the spectrum is not uniformly used and therefore could be ‘shared with’ (made available to) other applications.

## Rationale

**It is important to consider how to use the Digital Dividend most effectively to benefit citizens and businesses. The licensing regime should not jeopardize the future of the UHF band.**

The use of TV white space should not impact the preparation process for WRC-15. Deployment of TV white space systems should not distort the possible evolution of use of the TV UHF band, especially when considering the discussions on the Digital Dividend 2. TV white space systems need to have the capabilities to adapt any change of use of the band (i.e., network evolutions in band and in the adjacent band) without asking for compensation (i.e., financial compensation or refarming in alternative bands). Finally, due to their regulation status, the TV

white space systems should not claim for any protection (even to the primary mobile service) and should not create any interference, including in the adjacent bands.

Although we acknowledge it to be hard work, bands that are well-suited to mobile should be cleared and reallocated. Even if the band cannot be fully cleared, we must explore exclusive licensing models that protect incumbents on the basis of temporal, geographical or frequency-based exclusivity, rather than moving directly to more uncertain options. The risks of being wrong about an unproven approach are too high.

It is also important to note that TV white spaces would not guarantee high-quality mobile broadband data services due to:

- non-homogeneous geographical coverage and fragmented bandwidth availability, as it is impossible to have sufficient bandwidth to mobile broadband service everywhere and with the necessary quality of service;
- lack of availability of a single, well-standardised technology solution, usable in all nations/regions, implying a lack of scale economies and related high costs for network and user equipment due to needed customization of proprietary solutions, e.g., for a single or few markets;
- lack of coexistence studies to evaluate interference effects between mobile broadband systems using TV white space and digital TV reception.

All this would be directly translated into design complexity and into extremely inefficient use of the bandwidth due to very extended guard bands to be adopted (TV signal–guard band–TV white space for mobile broadband use–guard band), resulting, from a marketing point of view, into scarce equipment availability and very high costs for the final customer.

**The use of TV white spaces must not distort the market through inappropriate regulation. Eliminating the cost of acquiring licensed spectrum and providing cellular-type mobile services could create an unfair advantage.**

TV white space services intend to use unused TV spectrum to provide non-broadcasting services that could be provided by mobile networks, from broadband to M2M, smart metering, TV, etc. In principle, one of the main advantages of this technology is to use parts of spectrum licensed to existing terrestrial TV networks — at lower heights — where most of the broadcast coverage is provided by a few high masts. Another advantage is that it would use unlicensed spectrum, eliminating the cost of acquiring licensed spectrum. In this case, white spaces networks are not seen as complementary networks, but substitutive for cellular mobile services. As both networks will compete in providing the same services, it is relevant to state that white space will use free spectrum that could create an unfair advantage and distort the market.

**TV white space is currently based on the concept of a spectrum-use database combined with geo-location to the spectrum resource for which quality of service and spectrum availability is not predictable. For TV white space, there is no *a priori* determination of the spectrum to be eventually accessed.**

With the concept of a spectrum-use database combined with geo-location, there is no *a priori* determination of the spectrum to be eventually accessed by the secondary user. In this scenario, secondary user may access parts of unused spectrum which is shared with other radio systems without causing harmful interference to the incumbent users. It involves significant technical

challenges such as continuous monitoring of the incumbent activities for reliable detection of the unused (idle) periods, rapid evacuation of the occupied channels once the incumbent activity restarts, etc. In this scenario, the selection of spectrum to be eventually accessed is made on a real-time basis following a radio environment analysis.

Furthermore, recent studies estimating TV white space availability in some countries such as Italy and France show that it can be fragmented and more abundant in rural areas, with larger contiguous blocks of unused channels available, as TV broadcasting priorities are linked to higher population density.

**Interference management remains a top priority, and that creates some confidence. The use of TV white spaces, on a secondary unlicensed basis, requires careful interference avoidance towards primary users such as existing TV broadcasters, as well as services in adjacent bands.**

TV white spaces are portions of spectrum unused by digital TV, characterized by an unpredictable allocation in bandwidth, time and space. Their possible use, on a secondary unlicensed basis, requires careful interference avoidance towards primary users such as existing TV broadcasters, as well as services in adjacent bands, under the control of a ruled database providing a list of available channels within the geographic area of operation. In practice, unlicensed TV white space devices have to contact an authorised database system to obtain a list of channels that are available for their operation (e.g., channels not occupied by authorized primary TV services) at their individual locations and have to operate only on those channels.

The GSMA acknowledges the importance of interference policy as long as there is no relaxation in this critical issue. MNOs, among others, need feedback on this issue.

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The GSMA's government and regulatory affairs team represents the mobile industry around the world, advocating for a regulatory environment that encourages investment, maximises innovation and creates opportunity for mobile operators, the wider mobile ecosystem and mobile users. Through direct engagement with governments, we help to shape the global regulatory agenda.

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