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INTERNATIONAL TELECOMMUNICATION UNION

South Africa (Republic of)

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QUESTIONNAIRE ON SPECTRUM REQUIREMENTS FOR TERRESTRIAL TELEVISION BROADCASTING IN CONNECTION WITH WRC-15 AGENDA ITEM 1.2

References: Administrative Circular CA/201

Introduction and Background

1 Consistent with the directives set forth by Administrative Circular CA/201 and in accordance with the outcomes of the first session of the Conference Preparatory Meeting 15-1, ITU-R Working Party 6A seeks estimates from Members States and Sector Members of current and future spectrum requirements for terrestrial television broadcasting in Region 1 and Iran.

2 One particular question that is to be addressed by the JTG 4-5-6-7 is to confirm the lower edge of the allocation to the mobile service made at WRC-12 from 694-790 MHz. As a result Working Party 6A realized that the JTG 4-5-6-7 needs to be fully informed about the implications to the broadcasting service consequential to that decision.

3 The following questionnaire, which was sent to all Administrations and Sector Members in Region 1 and Iran, was designed to gather information on spectrum use in the band 694-790 MHz for television broadcasting.

4 Administrations and Sector Members were also invited to make more detailed inputs addressing the matter of current and future spectrum requirements for television broadcasting to the next meeting of WP 6A.

5 Administrations and Sector Members were requested to submit responses to brsgd@itu.int or rsg6@itu.int by 31 July 2012.

6. To date a total of 45 responses were received. Of these; 30 from CEPT administrations, 3 from ASMG , 1 AUT administration, 1 from Iran and 10 from Sector Members, all from Europe. Two Sector Members that responded, EBU and BNE, are associations representing most of the European broadcasters and network operators.

7. Indications are that some Member States did not have sufficient time to respond to the Questionnaire.

(AFS) South Africa (Republic of) responses to Circular letter 6/LCCE/78

Question 1

a) What standards have you adopted for digital terrestrial television broadcasting?	DVB T2
b) Have you started introduction of digital terrestrial television services?	Yes,
c) If yes, please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use to inform WP 6A.	Two (2) National Multiplexes Planned And Two (2) Mobile Multiplexes in Metropolitan
(d) the total spectrum use to inform WP 6A	NB: Please refer to Annexure A for configurations

Question 2

a) Have you commenced analogue television switch-off?	a) No, not yet. Initial intentions were to switch of in December 2013. However this is likely to be reviewed with possible alignment of the switch-off date to coincide with 17 June 2015.
b) If you have any such plans, when do you expect to have completed the analogue switch-off process?	17 June 2015.

Question 3

a) What is the percentage of viewer uptake of terrestrial television in your country, including those whose service provider uses terrestrial broadcast re-transmission (e.g. in cable networks)?	DTT is still to be launched soon. However, currently trial is running in selected areas. The DTT Network rollout stands at sixty (60%) percent
b) If possible, please also provide details of the number or proportion of users who receive television primarily by terrestrial means.	There are currently five million households who receive who receive television through terrestrial means in analogue which covers eighty five percent of the population (85%)

Question 4

a) Indicate how many analogue television transmitters use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution **232 (WRC-12)**).	i) One hundred and forty four (144) Analogue operational assignments in 694 to 790 MHz and .
b) How many are in the remaining part of the UHF band.	ii) Seventy-one (71) are in the band 790 to 862 MHz And Iii) Three Hundred and sixty Eight (368) Analogue operational assignments in 470 to 694 MHz

Question 5

a) What frequencies/channels are currently used or intended to be used by digital terrestrial television broadcasting in your country? Please distinguish between those in use and those intended to be used.	i) Implementation of DTT is currently distributed over the complete band of 470 MHz to 860 MHz. This is for the initial implementation phase. ii) There will be a digital to digital migration after which only 470 MHz to 694 MHz could be used as of 17 June 2015.
b) If allotments/SFNs are in use, a sketch map of frequency allocations could be included, with an accompanying table of allocations, as shown in Annex 2. Otherwise, it might be possible to show main transmitters	i) Please refer to the SFN map structured below. ii) The seven (7) multiplex structure is made of four groups from channels 21 to 48 (470 MHz to 694 MHz) as

and channels, grouped in layers, in a table.	assignment plan as shown in table 1. iii) Figure 2 t0 3 with an associated table is an indication of the SFN distribution plan in accordance with the provincial makeup of the Country. iv) Please note that in order to make this plan to be workable, an understanding and arrangements have been developed and under discussion with the six neighbouring Administrations, (Botswana, Lesotho, Mozambique, Namibia, Swaziland and Zimbabwe) to adopt a common approach to the plan.
c) Please indicate how many digital television assignments/allotments use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution **232 (WRC-12)**,	i) There are currently one hundred and thirty one (131) assignments in the frequency band 694 to 790 MHz which will be used during the implementation of DTT in the frequency sub-band 694-790 MHz in line with Resolution 232 (WRC-12),
d) How many are in the remaining part of the UHF band.	i) There are three hundred and fifty four (354) frequency assignments in the frequency sub-band 694-790 MHz and thirty (30) are within the band 790 to 860 MHz

Question 6

a) Are those frequency bands also shared with other primary services?	(i) There allocation 470 to 790 is shared on a primary service with the Radio Astronomy. (ii) There allocation 790 to 862 is shared on a primary service with the Fixed Links (iii) There allocation 790 to 862 is shared on a primary service with the Mobile except aeronautical (Foot Note 5.316 B)
b) If yes, please give details of those systems and their spectrum use.	(i) The Radio Astronomy operates in frequency range 66 to 614 MHz whilst Broadcasting services operate in the frequency range 470 to 854 MHz (ii) The broadcasting range 790 and 862 is shared between Broadcasting and fixed services in the frequency range 856 and 864.1 MHz. These fixed links are to be migrated by 2015 in terms of the Frequency Migration Plan being developed by ICASA in 2012. (iii) This implementation of the mobile service is being aligned with the migration analogue to Digital Terrestrial Television by 2015 in terms of the Frequency Migration Plan being developed by ICASA in 2012.

Question 7

a) Are those frequency bands also shared with secondary services such as PMSE (Programme Making and Special Events), radio astronomy or wind-profile radar?	(i) The services are shared on secondly services such as low power and self-help Analogue Television Stations (ii) There is also Sound Studio to transmitter links, radio microphones and in-house distribution systems. (iii) Radio microphones and (iv) In-house Television distribution systems.
b) If yes, please give details of those systems and their spectrum use.	(i) There 1595 Stations (Low Power and Self Help) with assignments distributed in the frequency range 470 to 860 MHz (ii) There are one hundred and forty three (143) Sound Studio Transmitter Links distributed in the frequency range 802 and 854 MHz. These are to

	be migrated out of this band by 2015 in line with the Frequency Migration Plan being developed by the regulator (ICASA) (iii) Radio Microphones (Usage unknown since it is random) (iv) In-house Television distribution systems. (Usage unknown since it is random)

Question 8

a) Do you foresee the adoption or expansion of television services broadcast using second-generation systems such as DVB-T2?	(i) Yes
b) If yes, please give indicative details of the planned transition, including any simulcast period.	(ii) During the transition period, there will be a simulcast of both Analogue and Digital Terrestrial Television. (iii) The launch date is yet to be finalised and communicated. (iv) It envisaged that analogue services will be switched off by 17 June 2015.

Question 9

a) Do you foresee a requirement for new and enhanced services, including HD and 3D television, on the terrestrial television platform?	(i) HD Definitely
b) If yes, please give indicative details of the number and nature of services planned, and if known, the expected timeframe for their introduction.	(ii) Timeframes are still to be determined since the main concentration is to launch the Standard Definition Services given the limitation of the current two DTT Multiplexes

Question 10

a) Are there plans in your country to launch more multiplexes in the future?	(i) Yes
b) If yes, how many more and when? Please also indicate the expected timeframe for their introduction.	(iii) The intention is to launch the third multiplex during the period 2013 to 2015 (iv) The plan is being develop to have seven (7) Multiplexes in the frequency Range 470 to 694 MHz and to launch these in in 2015.

Question 11

a) What is the amount of spectrum you foresee that will be required for terrestrial television broadcasting, if plans in Questions 8, 9 and 10 are to be supported, and services identified in Questions 6 and 7 are to be taken into account? Please indicate the modes of transmission that will be used, and timeframes. If appropriate, a suggested form to express these requirements is shown in Annex 3.	(i) The plan is to have seven (7) multiplex structure made of four groups from channels 21 to 48 (470 MHz to 694 MHz) as assignment plan as shown in table 1. Given the following (ii) That Three Hundred and sixty Eight (368) Analogue operational assignments in 470 to 694 MHz (iii) That One hundred and forty four (144) Analogue operational assignments in 694 to 790 MHz and (iv) Seventy-one (71) are in the band 790 to 862 MHz. (v) **NB** Please refer to Annex 3

ANNEXURE 1

Presentation of response to Question 1: *What standards have you adopted for digital terrestrial television broadcasting? Have you started introduction of digital terrestrial television services? If yes, provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use*.

Country	No of multi-plexes	System & modulation	FEC	GI	Reception mode[1]	Capacity per multiplex (Mb/s)	Current percentage population coverage	Intended percentage population coverage	Content per multiplex	Total capacity (Mb/s)	Total spectrum bandwidth used or intended for imple-mentation (MHz)[2]	Any additional comments (e.g. duration of licences)
AFS	2	DVB-T2, 256-QAM	3/5	1/8	Fixed	24.10	60.0%	85%	20 SD MPEG4	± 200 Mb/s	224	
	1	DVB-H, QPSK	1/2	1/4	Mobile	40.20	40.0%	45%	±20 Mobile CH			
	3	DVB-T2, 256-QAM	3/5	1/8	Fixed	27.10	0.0%	60%	12 SD MPEG4 + 2 HD MPEG4			
	1	DVB-T2, 256-QAM	3/5	1/8	Fixed	[tbc]	0%	60%	±20 Mobile CH			

1 Example - Fixed, portable outdoor/mobile, portable indoor.

2 Refer Sections 2 and 3 on page 1 of this circular.

ANNEXURE 2

Presentation of response to Question 5:

Table 1.

	Group 1	Group 2	Group 3	Group 4
1	CH21	CH22	CH23	CH24
2	CH25	CH26	CH27	CH28
3	CH29	CH30	CH31	CH32
4	CH33	CH34	CH35	CH36
5	CH37	CH38	CH39	CH40
6	CH41	CH42	CH43	CH44
7	CH45	CH46	CH47	CH48

Twenty Eight (28) Channels divided in groups of 4 to achieve the potential Seven (7) multiplexes groups of four (4) Channels.

Annexure 2 (Continued)

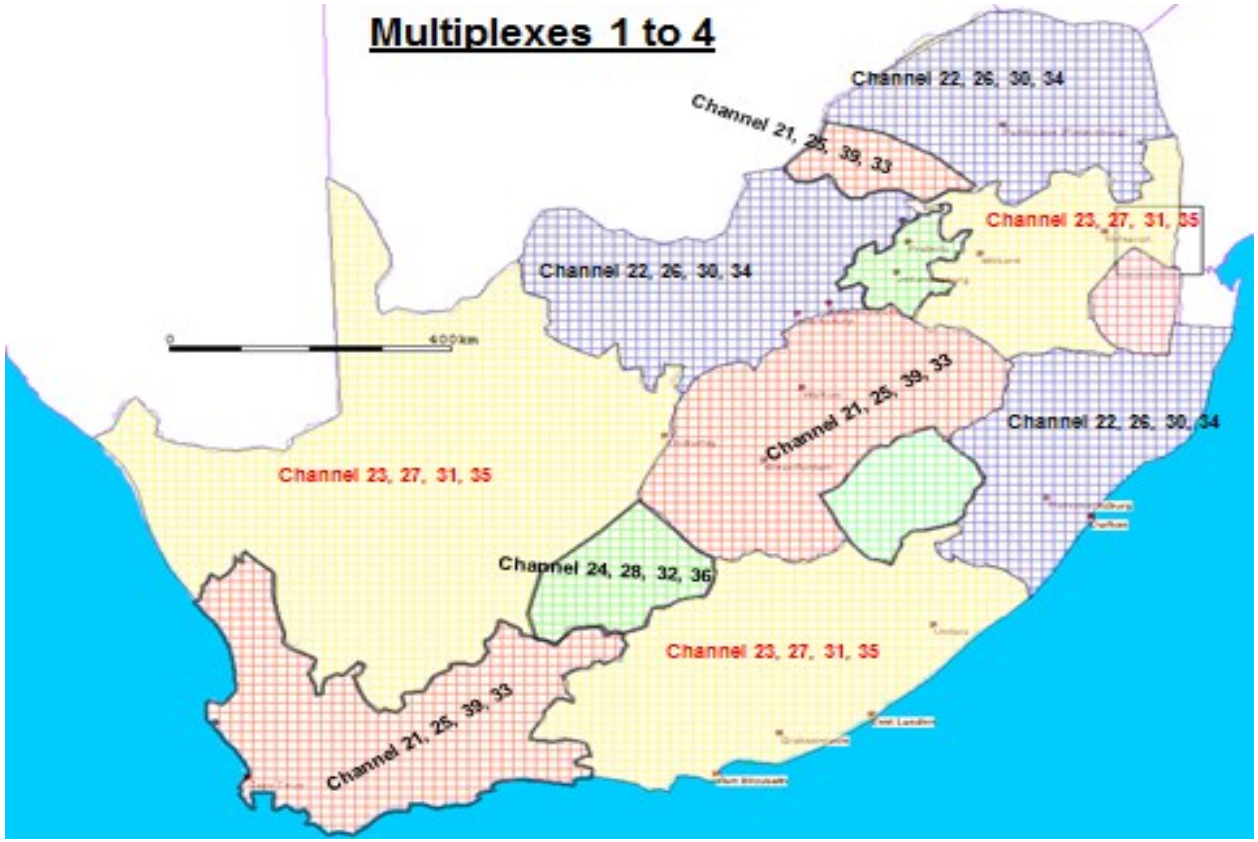

Figure 1.

South Africa's Proposed Hybrid Model: Mux1 to Mux4

MUX	NC1	NC2	NW	LP1	LP2	MP	KZN	GP	WC	EC	FS	LSO	SWZ
MX1	3 (CH23)	4 (CH24)	2 (CH22)	1 (CH21)	2 (CH22)	3 (CH23)	2 (CH22)	4 (CH24)	1 (CH21)	3 (CH23)	1 (CH21)	4 (CH24)	1 (CH21)
MX2	3 (CH27)	4 (CH28)	2 (CH26)	1 (CH25)	2 (CH26)	3 (CH27)	2 (CH26)	4 (CH28)	1 (CH25)	3 (CH27)	1 (CH25)	4 (CH28)	1 (CH25)
MX3	3 (CH31)	4 (CH32)	2 (CH30)	1 (CH29)	2 (CH30)	3 (CH31)	2 (CH30)	4 (CH32)	1 (CH29)	3 (CH31)	1 (CH29)	4 (CH32)	1 (CH29)
MX4	3 (CH35)	4 (CH36)	2 (CH34)	1 (CH33)	2 (CH34)	3 (CH35)	2 (CH34)	4 (CH36)	1 (CH33)	3 (CH35)	1 (CH33)	4 (CH36)	1 (CH33)
MX5	3 (CH39)	4 (CH40)	2 (CH38)	3 (CH39)	1 (CH37)	2 (CH38)	4 (CH40)	4 (CH40)	1 (CH37)	2 (CH38)	1 (CH37)	x	1 (CH37)
MX6	3 (CH43)	4 (CH44)	2 (CH42)	3 (CH43)	1 (CH41)	2 (CH42)	3 (CH43)	4 (CH44)	1 (CH41)	2 (CH42)	1 (CH41)	4 (CH44)	1 (CH41)
MX7	3 (CH47)	4 (CH48)	2 (CH46)	3 (CH47)	1 (CH45)	2 (CH46)	3 (CH47)	4 (CH48)	1 (CH45)	2 (CH46)	1 (CH45)	4 (CH48)	1 (CH45)

Annexure 2 (Continued)

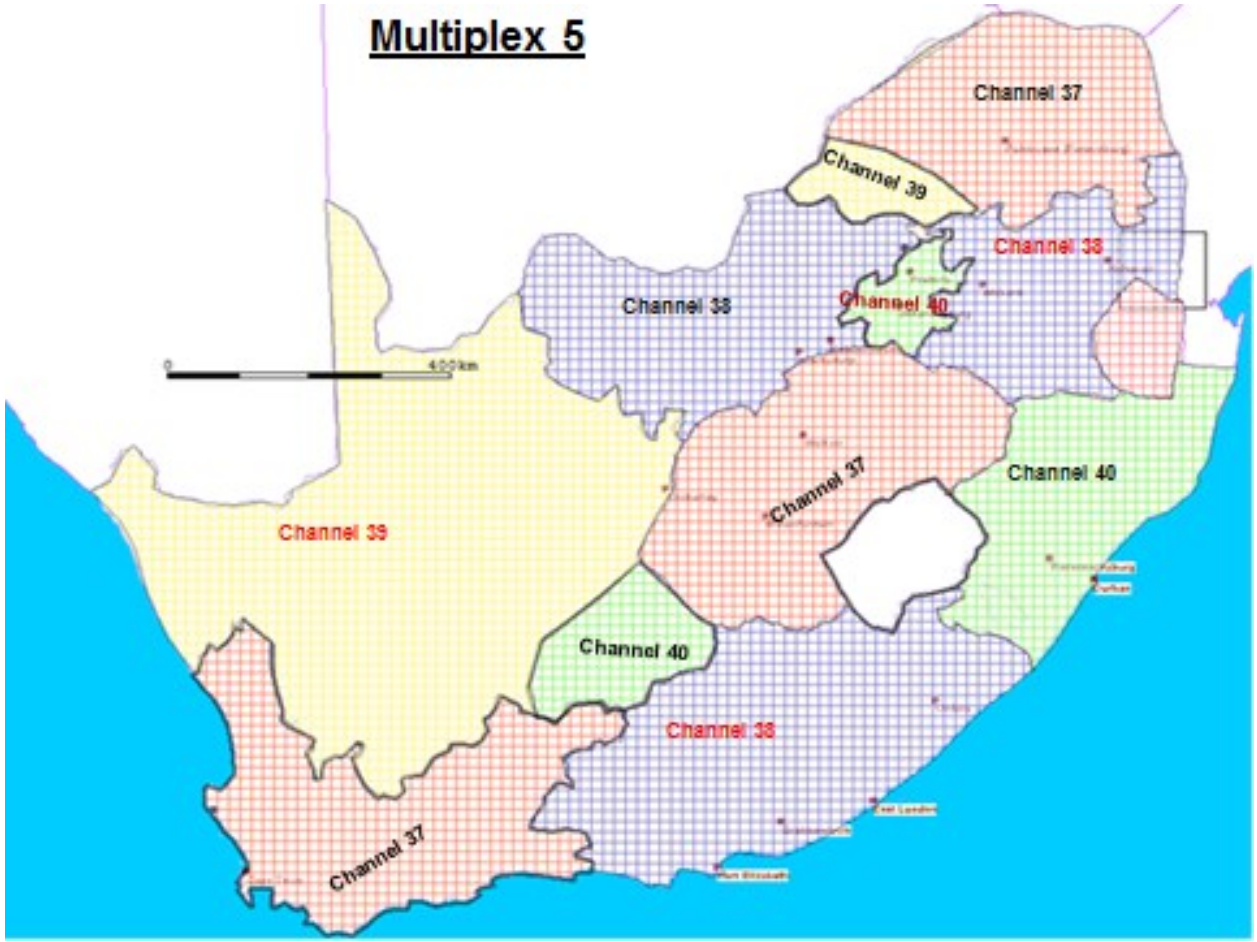

Figure 2.

South Africa's Proposed Hybrid Model: Mux5

MUX	NC1	NC2	NW	LP1	LP2	MP	KZN	GP	WC	EC	FS	LSO	SWZ
MX1	3 (CH23)	4 (CH24)	2 (CH22)	1 (CH21)	2 (CH22)	3 (CH23)	2 (CH22)	4 (CH24)	1 (CH21)	3 (CH23)	1 (CH21)	4 (CH24)	1 (CH21)
MX2	3 (CH27)	4 (CH28)	2 (CH26)	1 (CH25)	2 (CH26)	3 (CH27)	2 (CH26)	4 (CH28)	1 (CH25)	3 (CH27)	1 (CH25)	4 (CH28)	1 (CH25)
MX3	3 (CH31)	4 (CH32)	2 (CH30)	1 (CH29)	2 (CH30)	3 (CH31)	2 (CH30)	4 (CH32)	1 (CH29)	3 (CH31)	1 (CH29)	4 (CH32)	1 (CH29)
MX4	3 (CH35)	4 (CH36)	2 (CH34)	1 (CH33)	2 (CH34)	3 (CH35)	2 (CH34)	4 (CH36)	1 (CH33)	3 (CH35)	1 (CH33)	4 (CH36)	1 (CH33)
MX5	3 (CH39)	4 (CH40)	2 (CH38)	3 (CH39)	1 (CH37)	2 (CH38)	4 (CH40)	4 (CH40)	1 (CH37)	2 (CH38)	1 (CH37)	x	1 (CH37)
MX6	3 (CH43)	4 (CH44)	2 (CH42)	3 (CH43)	1 (CH41)	2 (CH42)	3 (CH43)	4 (CH44)	1 (CH41)	2 (CH42)	1 (CH41)	4 (CH44)	1 (CH41)
MX7	3 (CH47)	4 (CH48)	2 (CH46)	3 (CH47)	1 (CH45)	2 (CH46)	3 (CH47)	4 (CH48)	1 (CH45)	2 (CH46)	1 (CH45)	4 (CH48)	1 (CH45)

Annexure 2 (Continued)

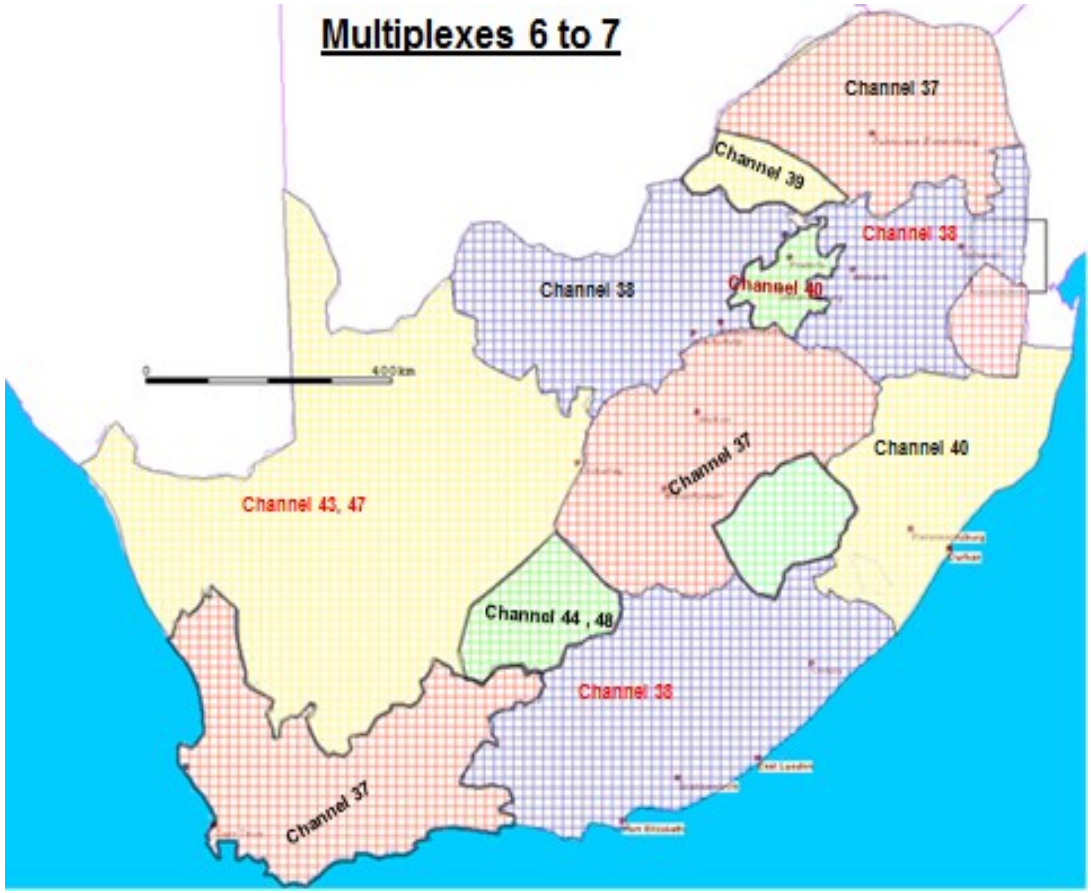

Figure 1.

South Africa's Proposed Hybrid Model: Mux6 & Mux7

MUX	NC1	NC2	NW	LP1	LP2	MP	KZN	GP	WC	EC	FS	LSO	SWZ
MX1	3 (CH23)	4 (CH24)	2 (CH22)	1 (CH21)	2 (CH22)	3 (CH23)	2 (CH22)	4 (CH24)	1 (CH21)	3 (CH23)	1 (CH21)	4 (CH24)	1 (CH21)
MX2	3 (CH27)	4 (CH28)	2 (CH26)	1 (CH25)	2 (CH26)	3 (CH27)	2 (CH26)	4 (CH28)	1 (CH25)	3 (CH27)	1 (CH25)	4 (CH28)	1 (CH25)
MX3	3 (CH31)	4 (CH32)	2 (CH30)	1 (CH29)	2 (CH30)	3 (CH31)	2 (CH30)	4 (CH32)	1 (CH29)	3 (CH31)	1 (CH29)	4 (CH32)	1 (CH29)
MX4	3 (CH35)	4 (CH36)	2 (CH34)	1 (CH33)	2 (CH34)	3 (CH35)	2 (CH34)	4 (CH36)	1 (CH33)	3 (CH35)	1 (CH33)	4 (CH36)	1 (CH33)
MX5	3 (CH39)	4 (CH40)	2 (CH38)	3 (CH39)	1 (CH37)	2 (CH38)	4 (CH40)	4 (CH40)	1 (CH37)	2 (CH38)	1 (CH37)	x	1 (CH37)
MX6	3 (CH43)	4 (CH44)	2 (CH42)	3 (CH43)	1 (CH41)	2 (CH42)	3 (CH43)	4 (CH44)	1 (CH41)	2 (CH42)	1 (CH41)	4 (CH44)	1 (CH41)
MX7	3 (CH47)	4 (CH48)	2 (CH46)	3 (CH47)	1 (CH45)	2 (CH46)	3 (CH47)	4 (CH48)	1 (CH45)	2 (CH46)	1 (CH45)	4 (CH48)	1 (CH45)

ANNEXURE 3

Suggested form of presentation of response to Question 11: *What is the minimum amount of spectrum you foresee that will be required for digital terrestrial television broadcasting in Bands IV & V, if plans in Questions 8, 9 and 10 are to be supported, and services identified in Questions 6 and 7 are to be taken into account? Please indicate the modes of transmission that will be used, and timeframes.*

One example methodology showing how spectrum requirements can be calculated from the different parameters using a set of assumptions can be found in Doc. 6A/59 submitted to WP 6A and which is currently under debate in this Working Party.

A sample response is shown for guidance only.

Country	**No of multi-plexes**	**System & modulation**	**FEC**	**GI**	**Reception mode[3]**	**Capacity per multiplex (Mb/s)**	**Intended percentage population coverage**	**Content per multiplex**	**Total capacity (Mb/s)**	**Total spectrum bandwidth needed (MHz)[4]**	**Any additional comments including time frames**
AFS	6	DVB-T2, 256-QAM	3/5	1/8	Fixed	30	85%	6 HD + 90 SD MPEG4	200.0	224	
	1	DVB-h, qpsk	1/2	1/4	Fixed	20	45%	2 HD MPEG4			

3 E.g. fixed, portable outdoor/mobile, portable indoor.

4 Refer Sections 2 and 3 on page 1 of this circular.