

Figure B.23: DVB-T Coverage from Winter Hill

The method followed was identical to the low band example described for the Crystal Palace example.

B5.5 ACI from UMTS BS to DVB-T Upper Band - Winter Hill: Results

Figure B.24 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to prevent ACI from UMTS Base Stations into Winter Hill Channel 62 DVB-T receivers in the co-channel (red) and in adjacent channels separated by various guard bands.

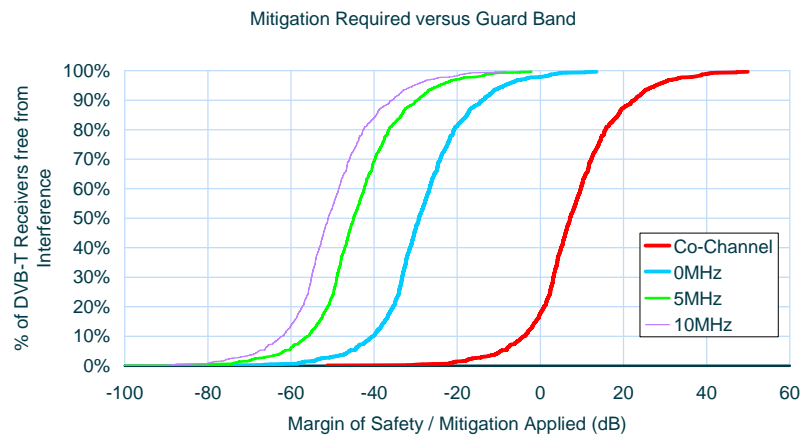


Figure B.24: ACI from Winter Hill (Channel 62) DVB-T into UMTS Base Stations

Table B.12 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to achieve the stated percentage of channel 62 DVB-T receivers free from degraded operation due to ACI from UMTS Base Stations in the co-channel and in an adjacent channel separated by various guard bands.

	<i>Co Channel</i>	<i>0MHz</i>	<i>5MHz</i>	<i>10MHz</i>
100.0%	49.9	13.5	-2.2	-8.3
99.5%	47.1	10.7	-5.0	-11.1
99.0%	40.0	3.7	-12.1	-18.2
95.0%	27.7	-8.7	-24.4	-30.5
50.0%	7.1	-29.2	-45.0	-51.1

Table B.12: Level of Mitigation (dB) Required to Achieve % of DVB-T Receivers Free from Adverse Effects of ACI

Figure B.25 below shows the margin of safety (yellow and green) between ACI from UMTS Base Stations into Winter Hill channel 62 DVB-T receivers in an adjacent channel separated by a 5MHz guard band.

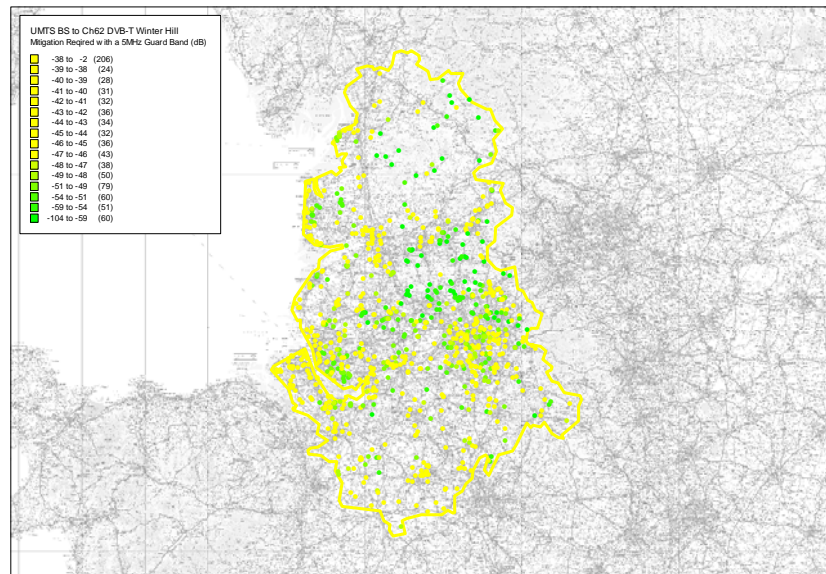


Figure B.25: ACI from Winter Hill Channel 62 DVB-T into UMTS Base Stations

B5.6 Options to Mitigate ACI from UMTS BS to DVB-T

As it has been demonstrated that only a few dB of mitigation is required, our view is that suitable mitigation may be achieved by careful setting of UMTS BS antenna azimuths thus:

- UMTS BS close to the DVB-T transmitter do not pose an ACI problem to DVB-T reception
- UMTS BS some distance from DVB-T transmitters (more than 20km) should avoid azimuths 180 degrees from the DVB-T transmitter to mitigate outgoing ACI into DVB-T receivers in the immediate vicinity.

Where azimuths cannot be set at 180 degrees from the DVB-T transmitter then additional filtering (20dB) could be applied to the UMTS BS to prevent ACI. This will require a guard band of 5MHz or more is in place between the interfering UMTS BS (downlink) channel and the victim DVB-T channel to allow for a filter attenuation slope. This guard band in itself will greatly reduce the occurrences of DVB-T receiver derogation, reducing the number of sites where filters are required.

B5.7 ACI from DVB-T into UMTS BS: Methodology

Figure B.26 below shows a calculation in progress of the ACI from Crystal Palace Channel 30 DVB-T into UMTS base stations. This interference was compared with the interference limit of -114dBm to determine the required level of mitigation or the margin of safety.

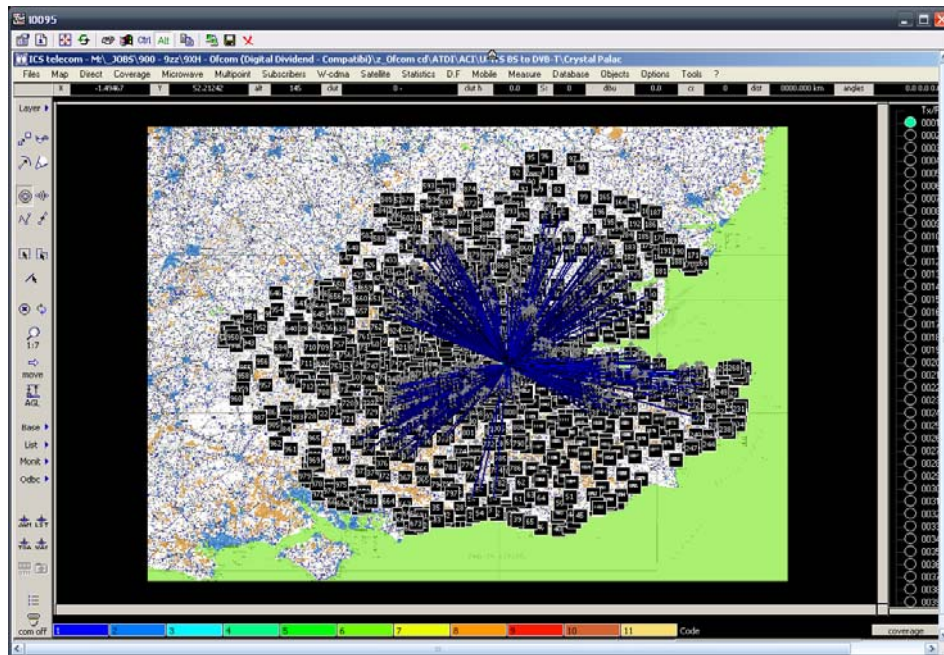


Figure B.26: Interference from Crystal Palace Channel 30 DVB-T into UMTS BS

In a similar way a calculation was made of the ACI from Winter Hill Channel 62 DVB-T into UMTS base stations. This interference was compared with the interference limit of -109dBm to determine the predicted C/I.

Figure B.27 below shows the C/I (measured by ERA) for various frequency offsets from the UMTS Uplink centre frequency at which UMTS operation began to degrade.

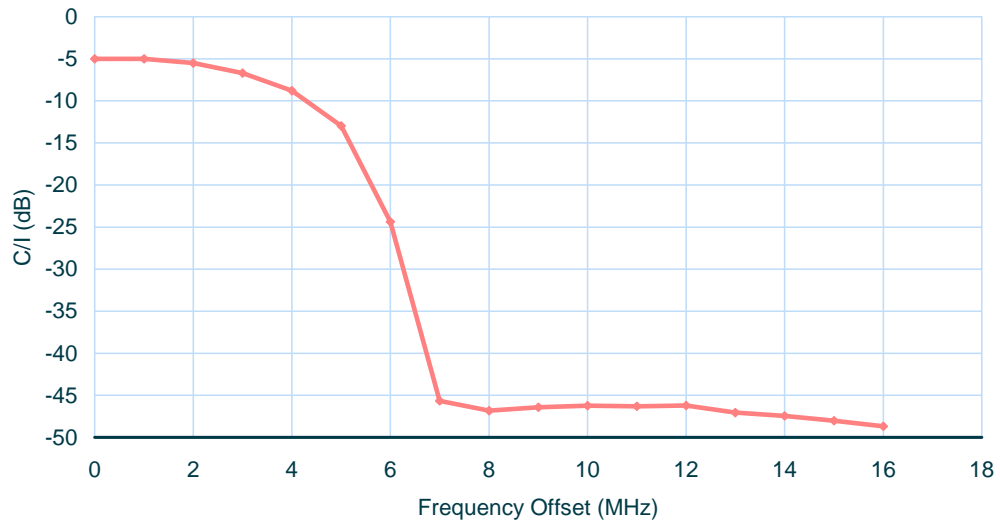


Figure B.27: UMTS BS (with power control) into DVB-T C/I measured by ERA

The C/I predicted by the radio-planning tool was compared with the values of C/I measured by ERA in order to calculate the margin of safety or mitigation required in both the co-channel situation and with a guard band of varying size.

B5.8 ACI from DVB-T into UMTS BS Lower Band - Crystal Place: Results

Figure B.28 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to prevent ACI from Crystal Palace Channel 30 DVB-T to UMTS Base Stations co-channel (red) and adjacent channels separated by various guard bands.

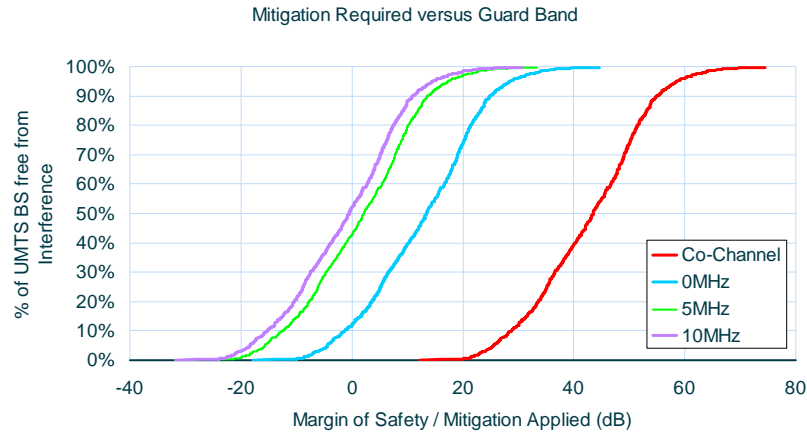


Figure B.28: ACI from Crystal Palace DVB-T transmitter to UMTS Base Station

Table B.13 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to achieve the stated percentage of UMTS base stations free from degraded operation due to ACI from Crystal Palace Channel 30 DVB-T in the co-channel and in an adjacent channel separated by various guard bands.

	<i>Co Channel</i>	<i>0MHz</i>	<i>5MHz</i>	<i>10MHz</i>
100.0%	74.5	44.5	33.3	30.6
99.5%	69.2	39.2	28.0	25.2
99.0%	66.2	36.2	24.9	22.2
95.0%	58.5	28.5	17.3	14.6
50.0%	43.5	13.5	2.2	-0.5

Table B.13: Level of Mitigation (dB) Required to Achieve % of UMTS Base Stations free from Adverse Effects of ACI

Figure B.29 below shows the level of mitigation (red) or the margin of safety (green) required to prevent ACI from Crystal Palace Channel 30 DVB-T into UMTS Base Stations in an adjacent channel separated by a 5MHz guard band.

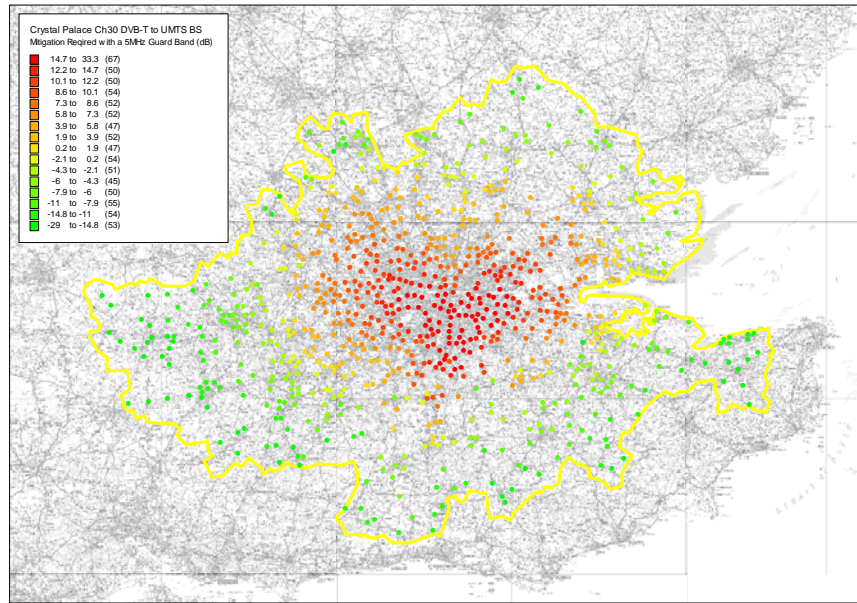


Figure B.29: ACI from Crystal Palace DVB-T transmitter to UMTS Base Stations [Source: Mason]

B5.9 ACI from DVB-T into UMTS BS Upper Band - Winter Hill: Results

A similar analysis was conducted using the Winter Hill DTT transmitter as an example. Figure B.30 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to prevent ACI from Winter Hill Channel 62 DVB-T to UMTS Base Stations co-channel (red) and adjacent channels separated by various guard bands.

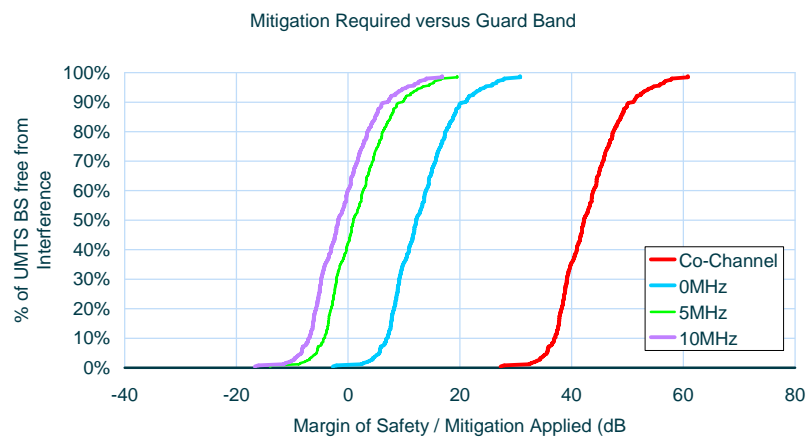


Figure B.30: ACI from Winter Hill Channel 62 DVB-T into UMTS Base Stations

Table B.13 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to achieve the stated percentage of UMTS base stations free from degraded operation due to ACI from Winter Hill Channel 62 DVB-T in the co-channel and in an adjacent channel separated by various guard bands.

	<i>Co Channel</i>	<i>0MHz</i>	<i>5MHz</i>	<i>10MHz</i>
100.0%	60.8	30.8	19.5	16.8
99.5%	60.8	30.8	19.5	16.8
99.0%	60.8	30.8	19.5	16.8
95.0%	54.3	24.3	13.1	10.4
50.0%	42.2	12.2	1.0	-1.8

Table B.13: Level of Mitigation (dB) Required to Achieve % of UMTS Base Stations Free from Adverse Effects of ACI

Figure B.31 below shows the level of mitigation (red) or the margin of safety (green) required to prevent ACI from Winter Hill Channel 62 DVB-T into UMTS Base Stations in an adjacent channel separated by a 5MHz guard band.

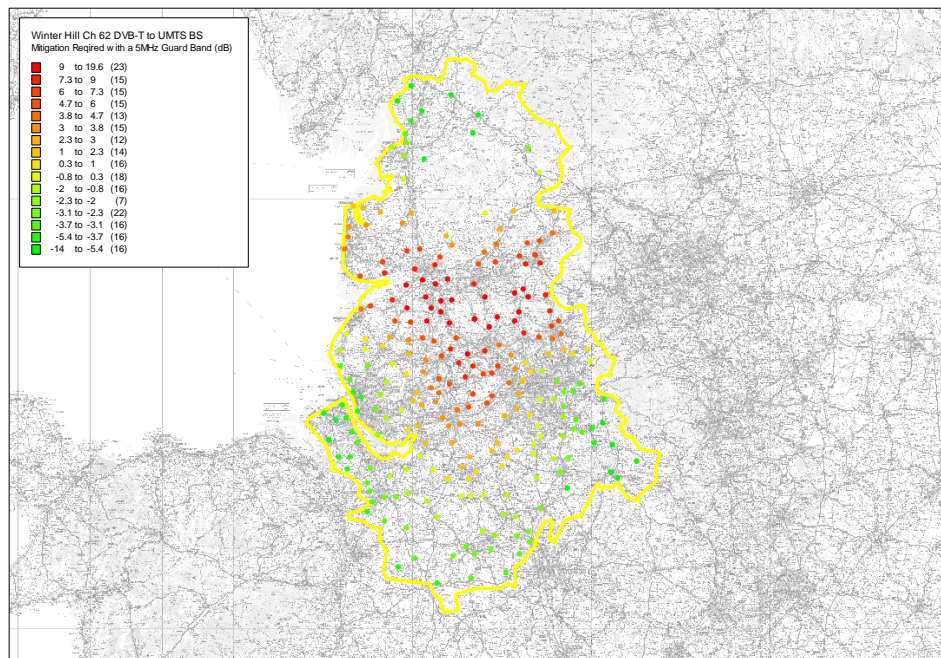


Figure B.31: ACI from Winter Hill Channel 62 DVB-T into UMTS Base Stations

B5.10 ACI from UMTS BS into DVB-H: Introduction

Our analysis of ACI between UMTS base stations to DTT suggests that the potential for interference depends on the site location (of the interfering base station) relative to the victim.

In the case of interference between UMTS base stations and DVB-H, there are two typical site location strategies that can in general be employed to minimise ACI:

- Ensure that the azimuth of the victim antenna is offset from the bearing of the interferer (i.e. separate wanted and interfering transmitters)
- Co-locate wanted and interfering transmitters to avoid a shorter path to the interferer than that to the wanted transmitter.

In the case of DVB-H and UHF UMTS where the cell sizes are comparable both options are feasible and each is analysed below.

B5.11 ACI from UMTS BS into DVB-H Co-located: Method

The following parameters were used for the calculation:

- DVB-H Tx: 1000W ERP / 62.15 dBm EIRP
- UMTS BS Tx: 50.8dBm EIRP
- Propagation losses are equal for UMTS and DVB-H
- Antenna performance is the same for UMTS and DVB-H

Figure B.32 below shows the below shows the C/I for UMTS BS into DVB-H) for various frequency offsets from the DVB-H centre frequency at which DVB-H operation began to degrade (this chart is based on DVB-T measured by ERA; DVB-H is assumed to tolerate 2dB more interference than DVB-T due to different modulation rates applied, consistent with assumptions elsewhere in this report and in companion work undertaken by Aegis Systems Limited).

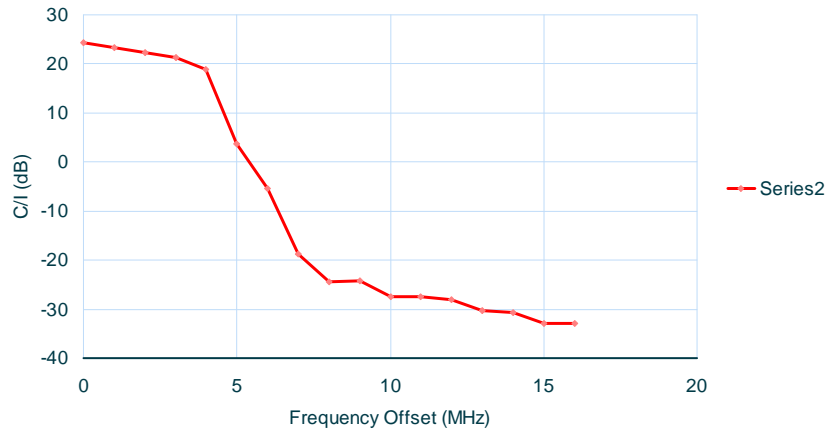


Figure B.32: UMTS BS into DVB-H C/I measured by ERA

B.12 ACI from UMTS BS into DVB-H Co-located: Results

Figure B.33 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to prevent ACI from UMTS-BS into DVB-H receivers when the UMTS-BS and the DVB-H transmitter are co-located. The red line shows the co-channel situation and adjacent channels separated by various guard bands are also shown.

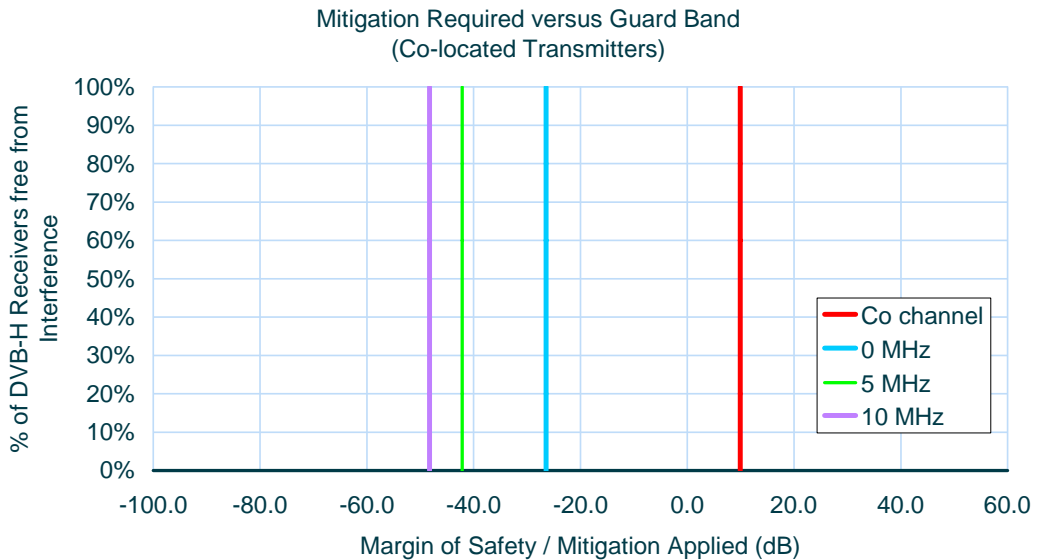


Figure B.33: ACI from UMTS BS to DVB-H Rx (UMTS Bs and DVB-H Tx collocated)

As this figure illustrates, when UMTS and DVB-H base stations are co-located, adjacent channel interference from UMTS base stations to DVB-H receivers is not a cause for concern, since, in all but the co-channel case, a margin of safety exists preventing ACI.

Our analysis was then repeated in the reverse case i.e. DVB-H base station to UMTS base station co-located, and also considering the impact of randomly located BS (i.e. not co-located). This is described below.

B.13 ACI from DVB-H into UMTS BS Co-located: Method

The following parameters were used for the calculation:

- DVB-H Tx: 1000W ERP / 62.15 dBm EIRP
- UMTS BS Wanted Signal -114dBm
- 60dB antenna isolation due to good co-located site engineering practices

Figure B.34 below shows the C/I for DVB-H into UMTS BS (measured by ERA) for various frequency offsets from the DVB-H centre frequency at which DVB-H operation began to degrade.

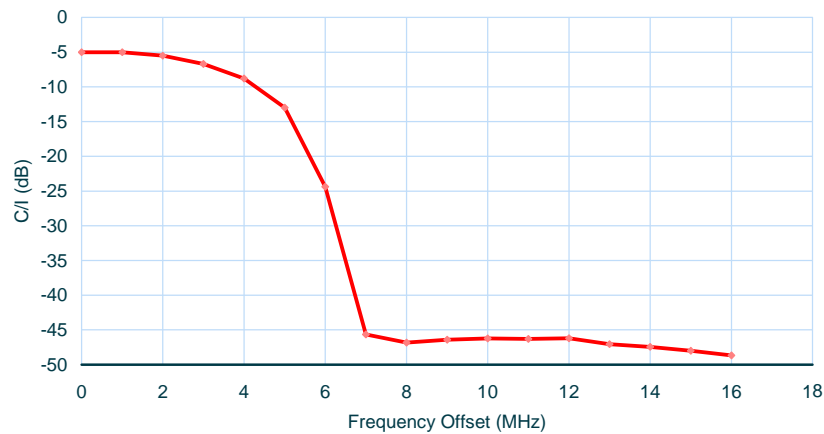


Figure B.34: DVB-H into UMTS BS C/I measured by ERA

B.14 ACI from DVB-H into UMTS BS Co-located: Results

Figure B.35 below shows the level of mitigation required to prevent ACI from DVB-H into UMTS-BS when the UMTS-BS and the DVB-H transmitter are co-located. The red line shows the co-channel situation and adjacent channels separated by various guard bands are also shown.

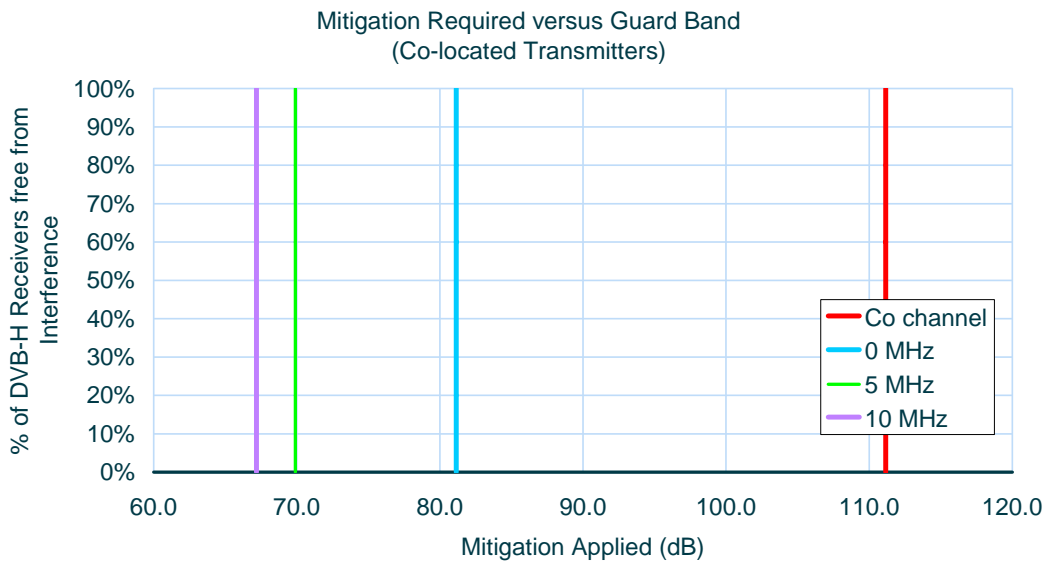


Figure B.35: ACI from DVB-H to UMTS BS (UMTS Bs and DVB-H Tx collocated)

Results illustrate that DVB-H transmitters will interfere with UMTS base station if co-located, requiring very high levels of mitigation, even with 10 MHz guard band applied. This suggests that it may not be feasible to co-locate DVB-H transmitters with UMTS base stations due to the impact on the UMTS base station receiver. Uncoordinated deployment of DVB-H and UMTS base station networks is likely to increase the probability of interference to DVB-H receivers however and this is explored in the next section.

B.15 ACI from UMTS BS into DVB-H not Co-located: Method

A UMTS network and a DVB-H network were modelled in ICS Telecom. With the exception of a minimum separation distance of 100m (in line with site engineering good practice) the networks were not correlated.

To prevent edge effects, the UMTS network continues for 20km beyond the DVB-H network.

The level of interference received from the sum of UMTS BS receivers was compared with a typical wanted signal of -114dBm at the UMTS Base station.

The prediction of C/I for each UMTS BS was compared with the measurements taken by ERA shown in Figure B.32 above.

B.16 ACI from UMTS BS into DVB-H not Co-located: Results

Figure B.36 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to prevent ACI from UMTS-BS into DVB-H receivers when the UMTS-BS and the DVB-H transmitter are co-located. The red line shows the co-channel situation and adjacent channels separated by various guard bands are also shown.

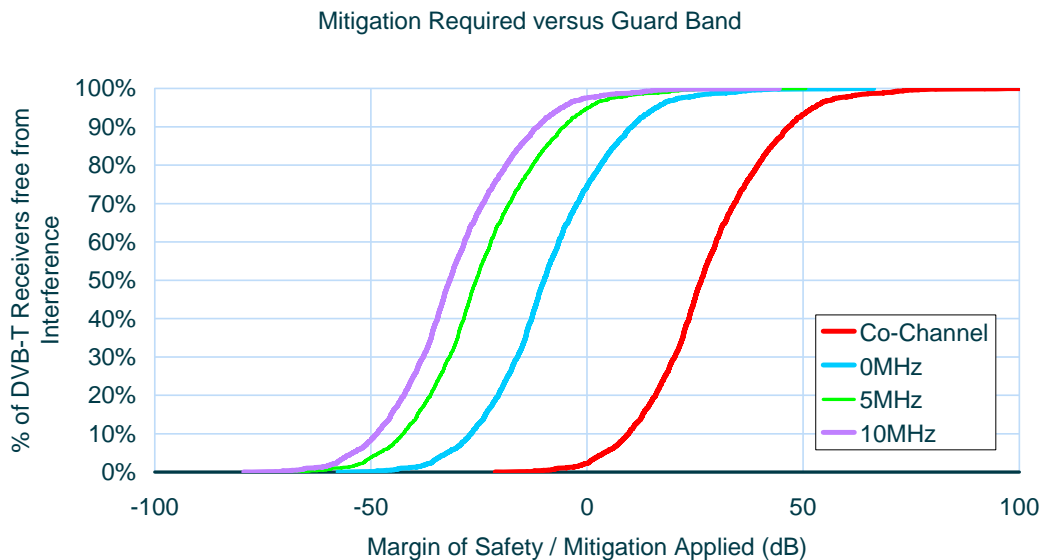


Figure B.36: ACI UMTS Base Station to DVB-H with randomly planned transmitters for various guard bands [Source: Mason]

Results illustrate that with no guard band, around 25% of DVB-H users suffer ACI in the scenario considered. Additional frequency separation mitigates this affect, reducing the impact to a small number of users (less than 5 %). Table B.14 below shows the level of mitigation (+dB) or the margin of safety (-dB) required to achieve the stated percentage of DVB-H receivers free from degraded operation due to ACI from UMTS base stations in the co-channel and in an adjacent channel separated by various guard bands.

	<i>Co Channel</i>	<i>0MHz</i>	<i>5MHz</i>	<i>10MHz</i>
100.0%	102.7	66.3	50.6	44.5
99.5%	74.2	37.8	22.1	16.0
99.0%	69.7	33.3	17.6	11.5
95.0%	52.2	15.8	0.1	-6.0
50.0%	26.5	-9.9	-25.6	-31.7

Table B.14: Level of Mitigation Required (dB) to Achieve % of DVB-H receivers free from adverse effects of UMTS BS ACI

B.17 ACI from DVB-H into UMTS BS not Co-located: Method

A UMTS network and a DVB-H network were modelled in ICS Telecom. With the exception of a minimum separation distance of 100m (in line with site engineering good practises) the networks were not correlated.

To prevent edge effects the DVB-H network continues for 20km beyond the UMTS network.

The level of interference received from the sum of DVB-H transmitters was compared with a typical wanted signal of -114dBm at the UMTS Base station.

The prediction of C/I for each UMTS BS was compared with the measurements taken by ERA shown in Figure B.34 above.

B.18 ACI from DVB-H into UMTS BS not Co-located: Results

Figure B.37 below shows the level of mitigation required to prevent ACI from DVB-H into UMTS-BS when the UMTS-BS and the DVB-H transmitter are not co-located. The red line shows the co-channel situation and adjacent channels separated by various guard bands are also shown.

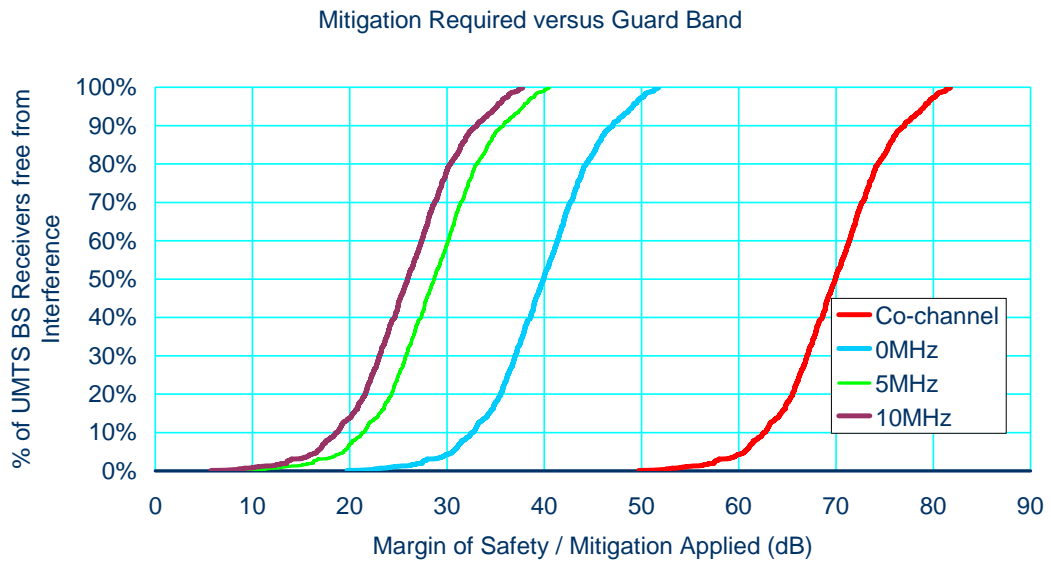


Figure B.37: ACI from DVB-H to UMTS BS (UMTS Bs and DVB-H Tx not collocated)

Results show that mitigation is required at a percentage of UMTS base stations to overcome interference from DVB-H transmitters, if the two networks are not coordinated. The level required depends on the frequency separation between the DVB-H transmitter and the UMTS uplink (base receive) channel. In the worst adjacent channel case with no frequency offset, the isolation requirement is up to 50dB to overcome interference.

Appendix C
UMTS Link Budgets

<i>Antenna Heights</i>	<i>Height</i>	<i>Units</i>	<i>Comments</i>
BS Antenna Height (Metres)			
Dense Urban (city centre of large cities)	40	m	Roof Top Site (10 floors)
Urban	30	m	Roof Top Site (6 floors) or tower
Suburban, rural and urban coverage infill	15	m	Free standing tower
Rx Antenna Height (Metres)	1.5	m	Hand Held Mobile

Table C1: Antenna Heights

<i>Downlink (Forward)</i>	----- AMR Voice -----			----- Data 384/64 kbps -----			<i>Units</i>
Frequency (MHz)	500	800	2100	500	800	2100	MHz
BS Transmit Power (for a balanced uplink/downlink)	29.7	30.0	30.7	37.5	37.7	38.4	dBm
BS Ant gain	12.0	15.0	18.0	12.0	15.0	18.0	dBi
BS Feeder Type	LDF4.5-50	LDF4.5-50	LDF4.5-50	LDF4.5-50	LDF4.5-50	LDF4.5-50	
BS Feeder Length	20.0	20.0	20.0	20.0	20.0	20.0	m
BS Feeder Loss	0.73	0.95	1.65	0.73	0.95	1.65	dB
BS Connector and Tails Loss	1.0	1.0	1.0	1.0	1.0	1.0	dB
BS EIRP	40.0	43.0	46.0	47.8	50.8	53.8	dBm
Thermal Noise Density	-173.93	-173.93	-173.93	-173.93	-173.93	-173.93	dBm/Hz
UE Noise Figure	6.0	6.0	6.0	6.0	6.0	6.0	dB
UE Noise Density	-167.9	-167.9	-167.9	-167.9	-167.9	-167.9	dBm/Hz
Chip rate	3840000	3840000	3840000	3840000	3840000	3840000	cps
UE Receiver Noise Power	-102.08	-102.08	-102.08	-102.08	-102.08	-102.08	dBm
UE Interference Margin	3.01	3.01	3.01	3.01	3.01	3.01	dB
UE Receiver Interference Power	-102.09	-102.09	-102.09	-102.09	-102.09	-102.09	dBm
UE Noise + Interference	-99.07	-99.07	-99.07	-99.07	-99.07	-99.07	dBm
Downlink Data Rate	12.2	12.2	12.2	384.0	384.0	384.0	kbit/s
UE Processing Gain	25.0	25.0	25.0	10.0	10.0	10.0	dBm
UE Required EbN0	7	7	7	4	4	4	dBm
UE Sensitivity	-117.1	-117.1	-117.1	-105.1	-105.1	-105.1	dBm
Soft Handover Gain	2.0	2.0	2.0	2.0	2.0	2.0	dB
UE Antenna Gain	-3.0	0.0	3.0	-3.0	0.0	3.0	dBi
UE Body Loss	6.5	10.0	10.0	6.5	10.0	10.0	dB
UE Required Signal Power	-109.6	-109.1	-112.1	-97.6	-97.1	-100.1	dBm
Downlink Path Loss	149.6	152.1	158.1	145.4	147.9	153.9	dB
Theoretical C/I	-18.0	-18.0	-18.0	-6.0	-6.0	-6.0	dB

Table C2: Downlink (Forward) Link Budget

<i>Uplink (Reverse)</i>	----- AMR Voice -----			----- Data 384/64 kbps -----			<i>Units</i>
Frequency (MHz)	500	800	2100	500	800	2100	MHz
UE Transmit Power	126.0	126.0	126.0	126.0	126.0	126.0	mW
UE Transmit Power	21.0	21.0	21.0	21.0	21.0	21.0	dBm
UE Antenna Gain	-3.0	0.0	3.0	-3.0	0.0	3.0	dBi
UE Body Loss	6.5	10.0	10.0	6.5	10.0	10.0	dB
UE EIRP	11.5	11.0	14.0	11.5	11.0	14.0	dBm
Thermal Noise Density	-173.9	-173.9	-173.9	-173.9	-173.9	-173.9	dBm/Hz
BS Noise Figure	3.0	3.0	3.0	3.0	3.0	3.0	dB
BS Noise Density	-170.9	-170.9	-170.9	-170.9	-170.9	-170.9	dBm/Hz
Chip rate	3840000	3840000	3840000	3840000	3840000	3840000	cps
BS Receiver Noise Power	-105.08	-105.08	-105.08	-105.08	-105.08	-105.08	dBm
BS Interference Margin	3.01	3.01	3.01	3.01	3.01	3.01	dB
BS Receiver Interference Power	-105.09	-105.09	-105.09	-105.09	-105.09	-105.09	dBm
BS Noise + Interference	-102.07	-102.07	-102.07	-102.07	-102.07	-102.07	dBm
Uplink Data Rate	12.2	12.2	12.2	64.0	64.0	64.0	kbit/s
BS Processing Gain	25.0	25.0	25.0	17.8	17.8	17.8	dBm
BS Required EbN0	5	5	5	2	2	2	dBm
BS Sensitivity	-122.1	-122.1	-122.1	-117.9	-117.9	-117.9	dBm
Soft Handover Gain	1.0	1.0	1.0	1.0	1.0	1.0	dB
Mast Head amplifier gain	1.7	2.0	2.6	1.7	2.0	2.6	dB
Antenna Diversity Gain	3.0	3.0	3.0	3.0	3.0	3.0	dB
BS Antenna Gain	12	15	18	12	15	18	dBi
BS Feeder Loss	0.73	0.95	1.65	0.73	0.95	1.65	dB
BS Connector and Tails Loss	1.0	1.0	1.0	1.0	1.0	1.0	dB
BS Required Signal Power	-138.1	-141.1	-144.1	-133.9	-136.9	-139.9	dBm
Uplink Path Loss	149.6	152.1	158.1	145.4	147.9	153.9	dB
Theoretical C/I	-20.0	-20.0	-20.0	-15.8	-15.8	-15.8	dB

Table C3: Uplink (Reverse)

<i>Planning level (rural/suburban)</i>	----- AMR Voice -----			----- Data 384/64 kbps -----			<i>Units</i>
Frequency (MHz)	500	800	2100	500	800	2100	MHz
S.D. Lognormal Fading ¹	7.8	8.3	9.5	7.8	8.3	9.5	dB
S.D. building penetration loss ²	6.0	6.0	6.0	6.0	6.0	6.0	dB
Mean in building penetration loss ²	11.0	11.0	11.0	11.0	11.0	11.0	dB
Cell Edge Probability	85.66%	86.21%	87.29%	85.66%	86.21%	87.29%	
Cell Area Probability	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	
Lognormal Slow Fade Margin (outdoor)	8.3	9.0	10.8	8.3	9.0	10.8	dB
Lognormal Slow Fade Margin (outdoor+BPL)	21.5	22.2	23.8	21.5	22.2	23.8	dB
Outdoor Planning Level (95% of locations)	-101.2	-100.0	-101.2	-89.3	-88.0	-89.2	dBm
In-building Planning Level (95% of locations)	-88.1	-86.9	-88.2	-76.1	-74.9	-76.3	dBm

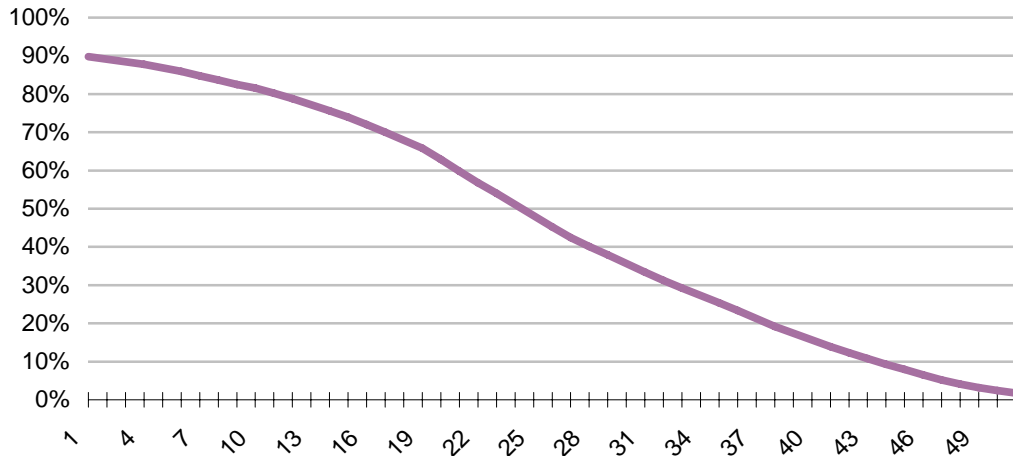
Table C4: Planning Levels for Rural and Suburban

<i>Planning Level (urban)</i>	----- AMR Voice -----			----- Data 384/64 kbps -----			<i>Units</i>
Frequency (MHz)	500	800	2100	500	800	2100	MHz
S.D. Lognormal Fading	6.5	6.9	8.2	6.5	6.9	8.2	dB
S.D. building penetration loss	6.0	6.0	6.0	6.0	6.0	6.0	dB
Mean in building penetration loss	11.0	11.0	11.0	11.0	11.0	11.0	dB
Cell Edge Probability	83.95%	84.55%	86.10%	83.95%	84.55%	86.10%	
Cell Area Probability	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	
Lognormal Slow Fade Margin (outdoor)	6.5	7.0	8.9	6.5	7.0	8.9	dB
Lognormal Slow Fade Margin (outdoor+BPL)	19.8	20.3	22.0	19.8	20.3	22.0	dB
Outdoor Planning Level (95% of locations)	-103.1	-102.0	-103.2	-91.1	-90.1	-91.2	dBm
In-building Planning Level (95% of locations)	-89.8	-88.8	-90.0	-77.8	-76.8	-78.1	dBm

Table C5: Planning Levels for Urban

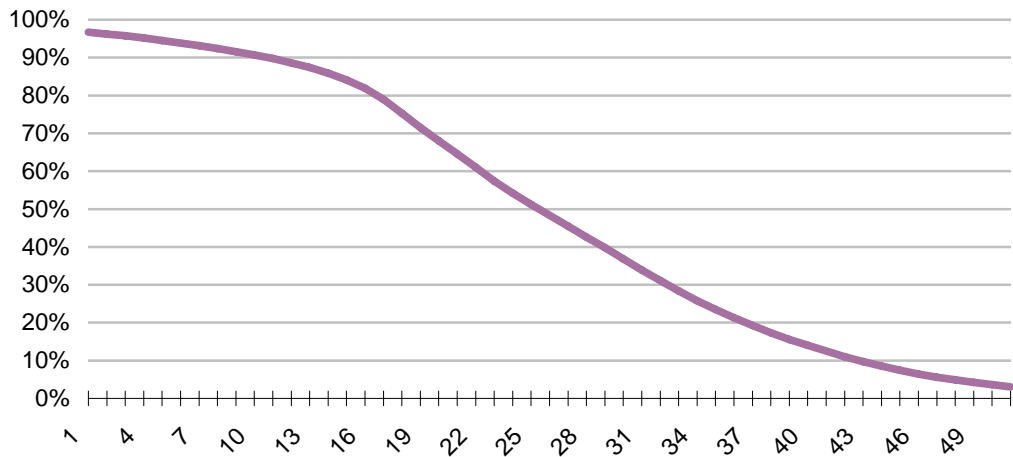
Appendix D
Incoming Co-Channel Interference from Continental DTT
Transmitters, per Channel

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



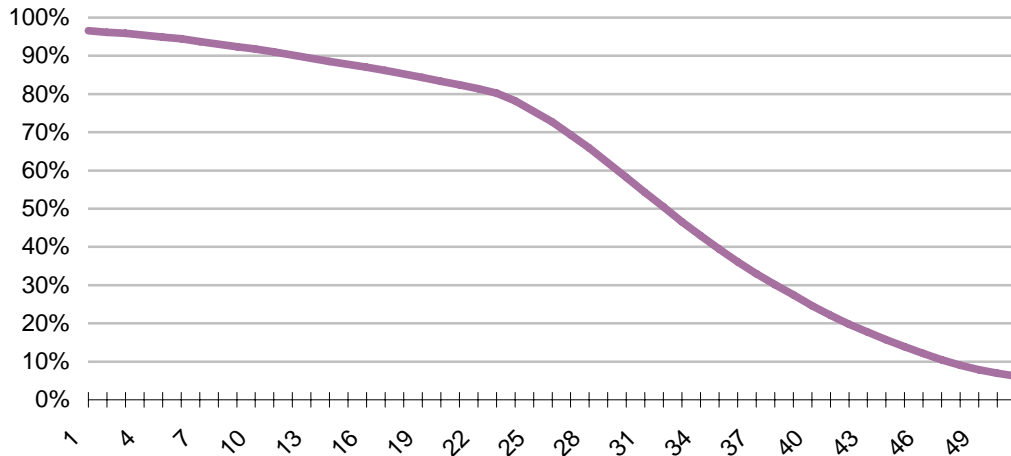
**Figure D.1: Incoming Interference by Area
UHF Channel 31 (550-558 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



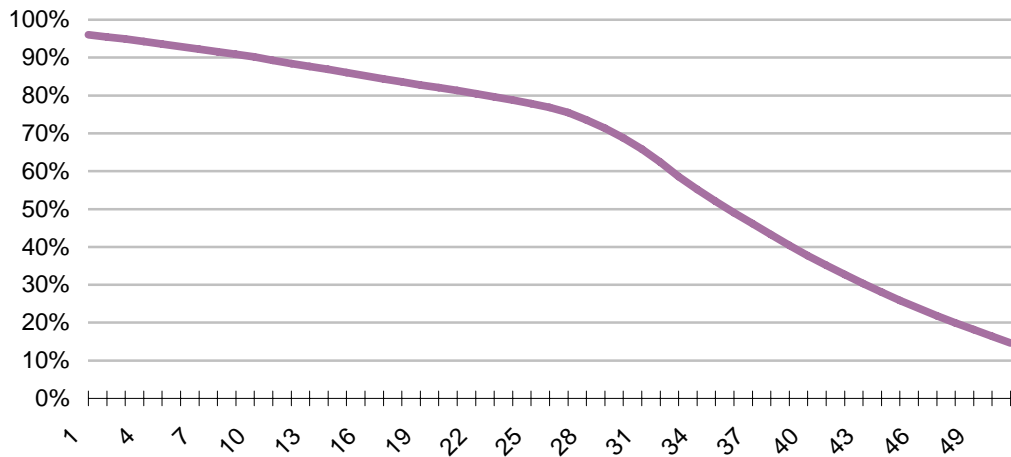
**Figure D.2: Incoming Interference by Area
UHF channel 32 (558-566 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



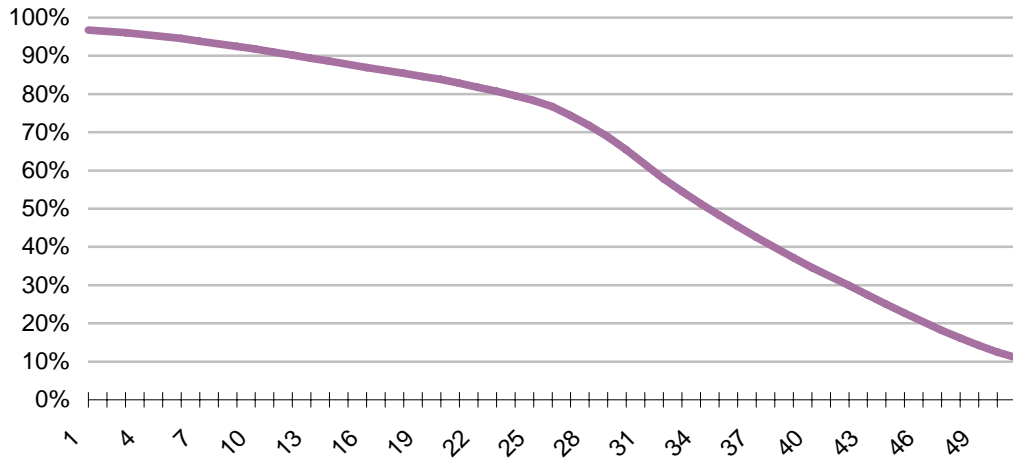
**Figure D.3: Incoming Interference by Area
UHF Channel 33 (566-574 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



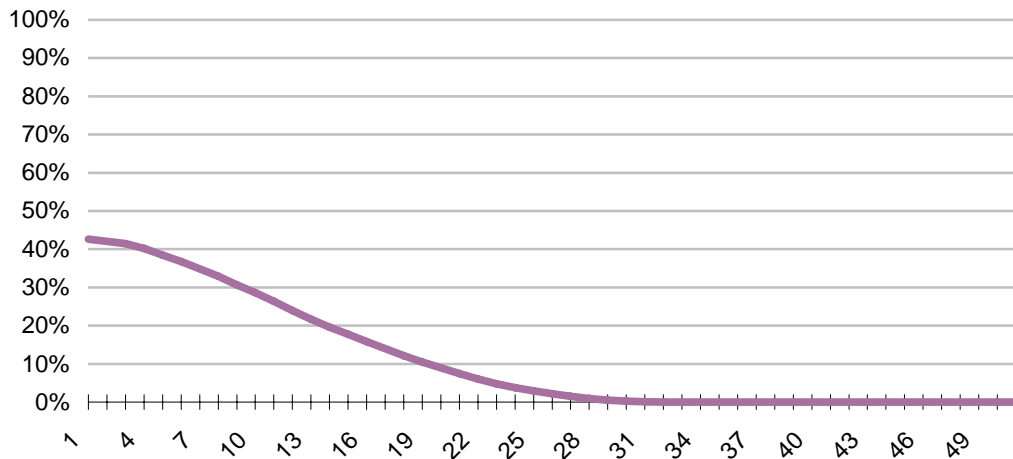
**Figure D.4: Incoming Interference by Area
UHF Channel 34 (574-582 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



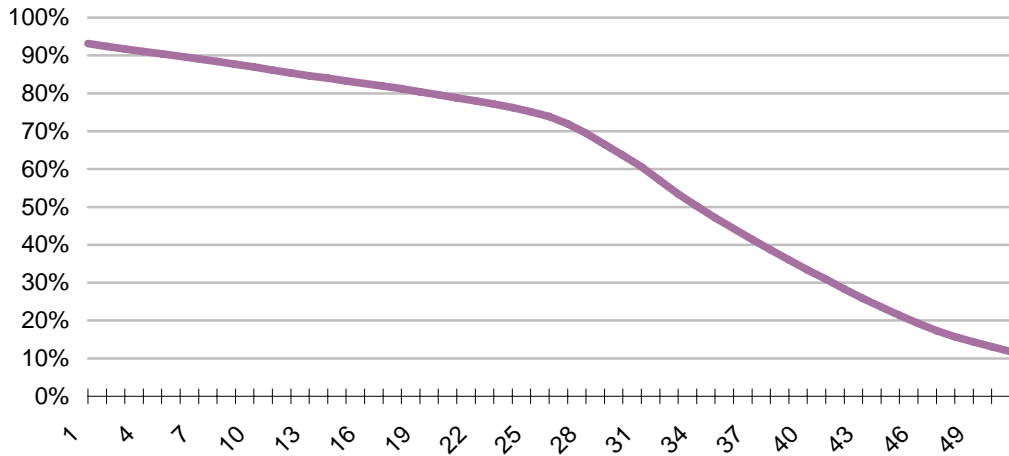
**Figure D.5: Incoming Interference by Area
UHF Channel 35 (582-590 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



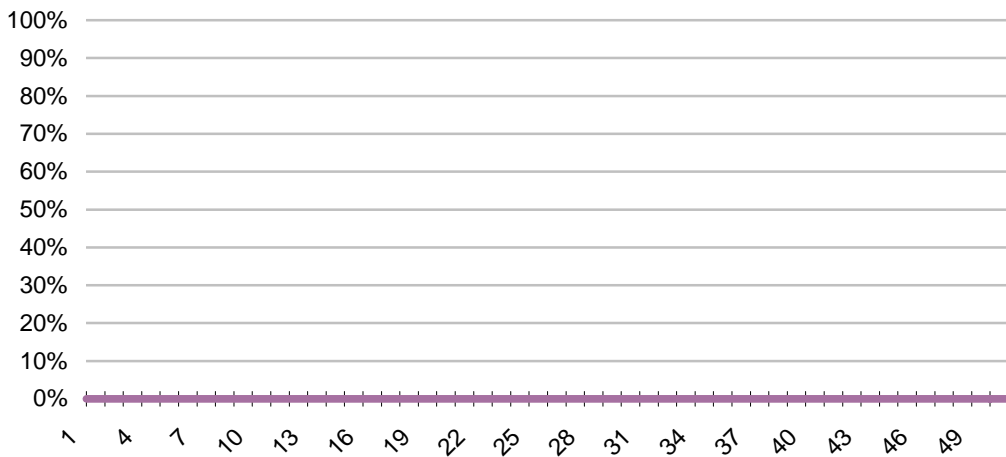
**Figure D.6: Incoming Interference by Area
UHF Channel 36 (590-598 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



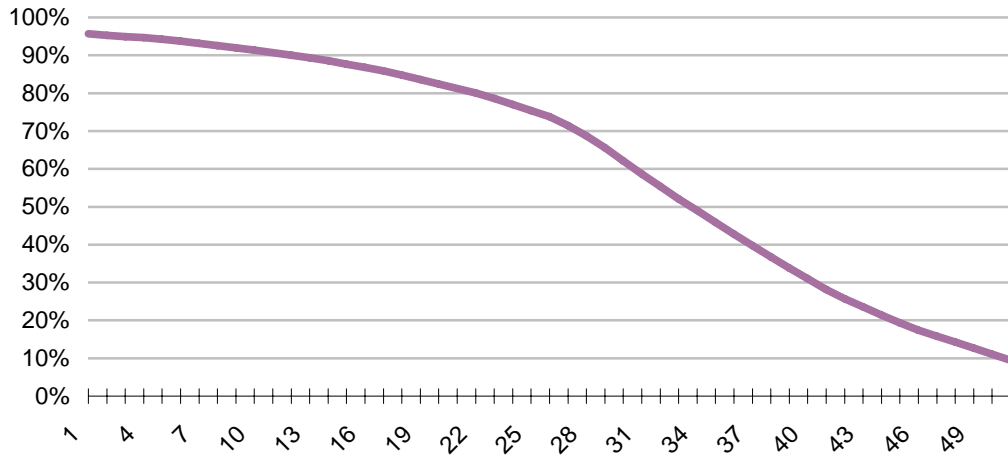
**Figure D.7: Incoming Interference by Area
UHF Channel 37 (598-606 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



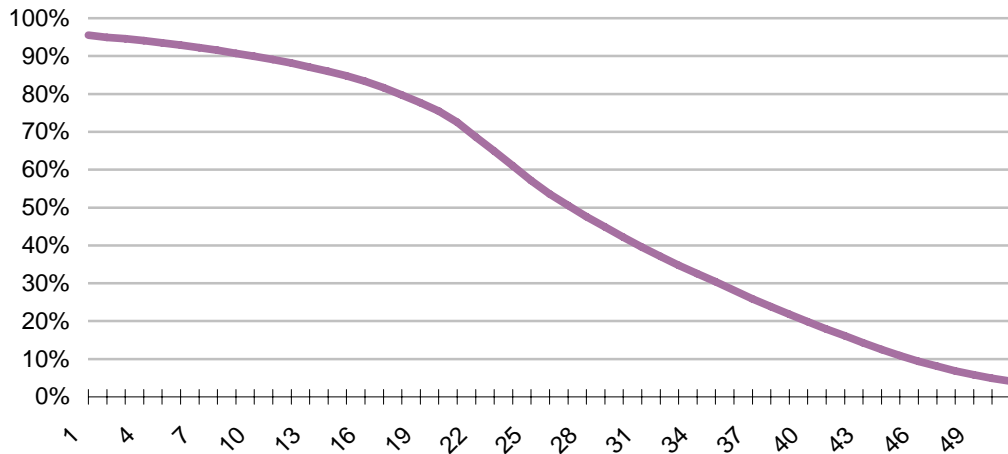
**Figure D.8: Incoming Interference by Area
UHF Channel 38 (606-614 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



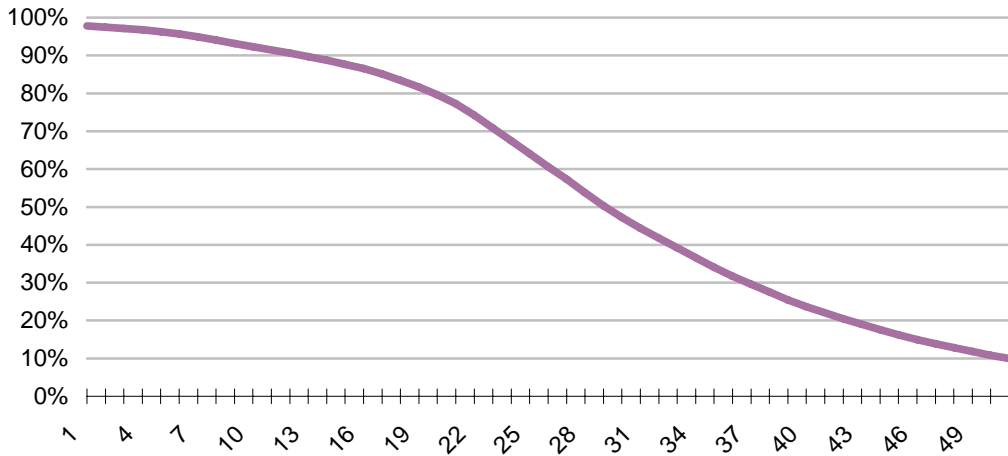
**Figure D.9: Incoming Interference by Area
UHF Channel 39 (614-622 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



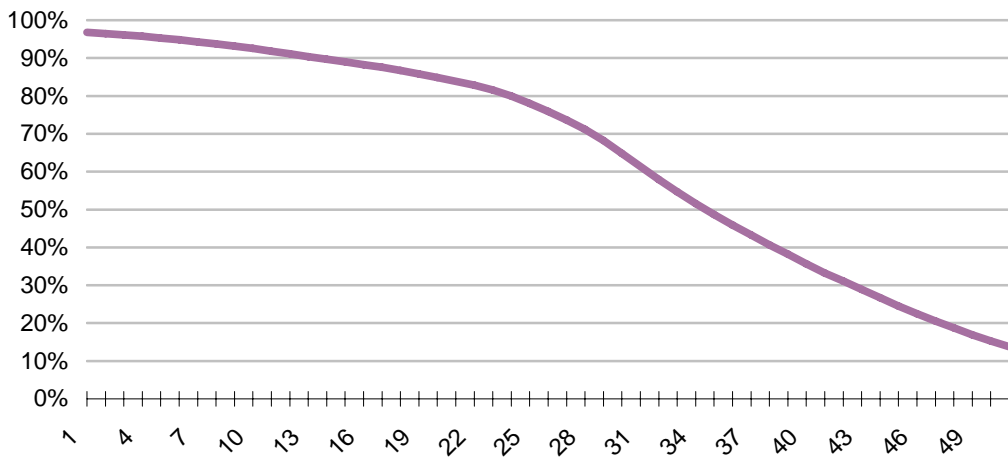
**Figure D.10: Incoming Interference by Area
UHF Channel 40 (622-630 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



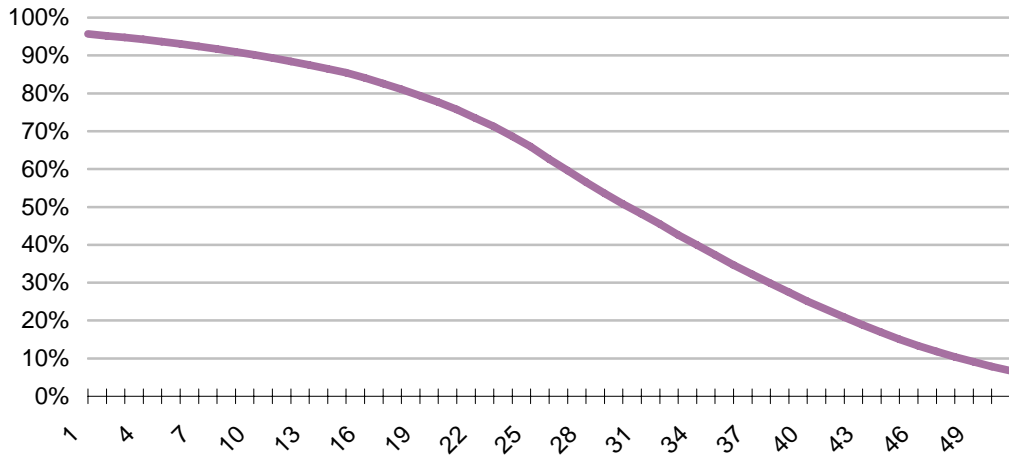
**Figure D.11: Incoming Interference by Area
UHF Channel 63 (806-814 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



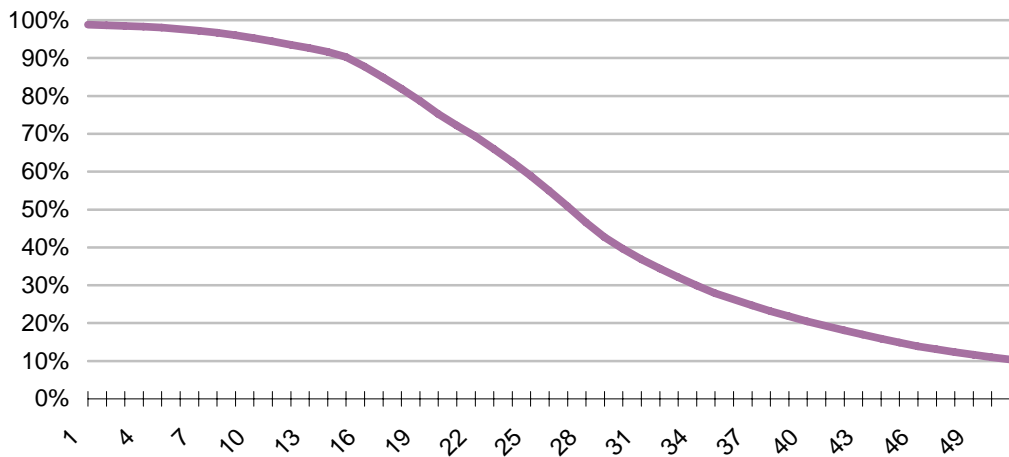
**Figure D.12: Incoming Interference by Area
UHF Channel 64 (814-822 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



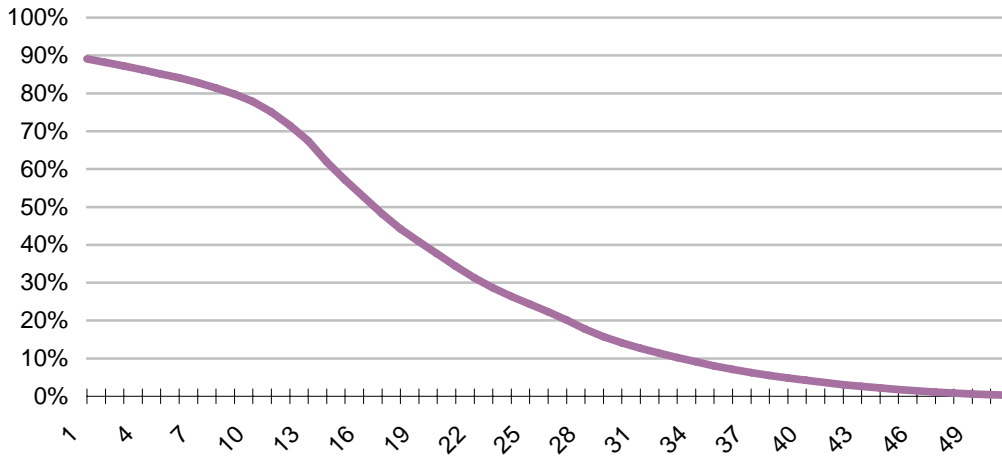
**Figure D.13: Incoming Interference by Area
UHF Channel 65 (822-830 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



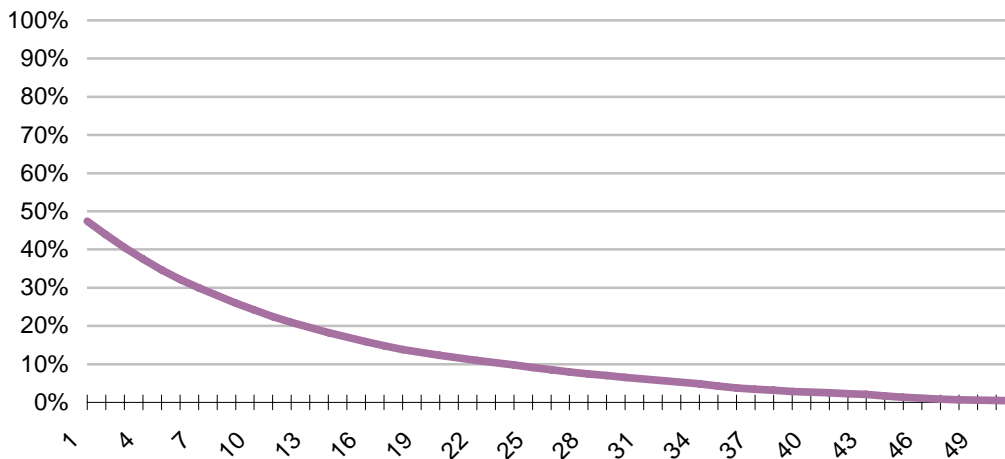
**Figure D.14: Incoming Interference by Area
UHF Channel 66 (830-838 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



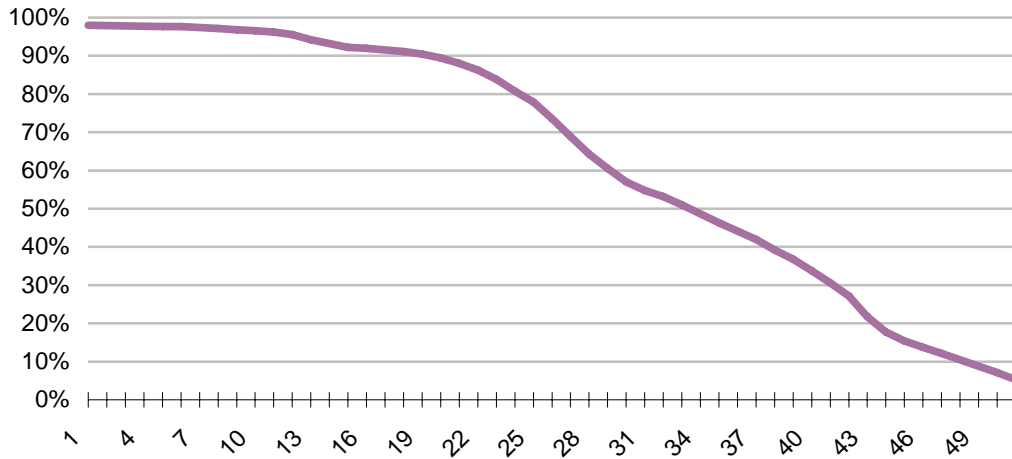
**Figure D.15: Incoming Interference by Area
UHF Channel 67 (838-846 MHz)**

UK Land Area
by Incoming Interference
Digital Dividend Released Spectrum



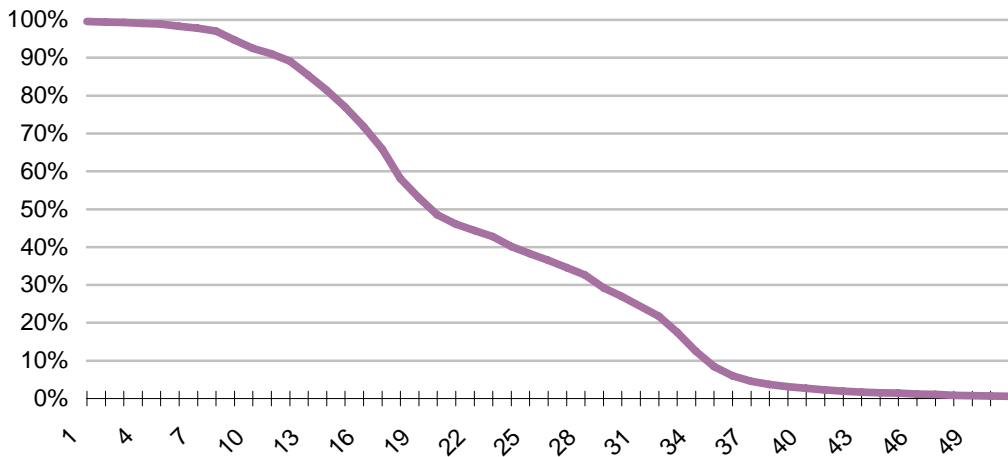
**Figure D.16: Incoming Interference by Area
UHF Channel 68 (846-854 MHz)**

UK Population
by Incoming Interference
Digital Dividend Released Spectrum

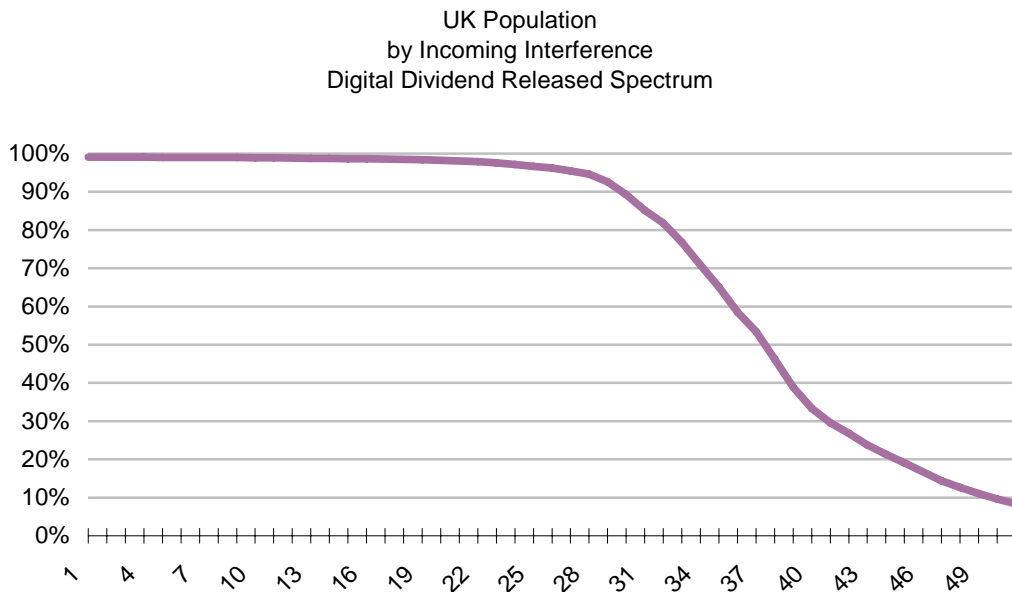


**Figure D.17: Incoming Interference by Population
UHF Channel 31 (550-558 MHz)**

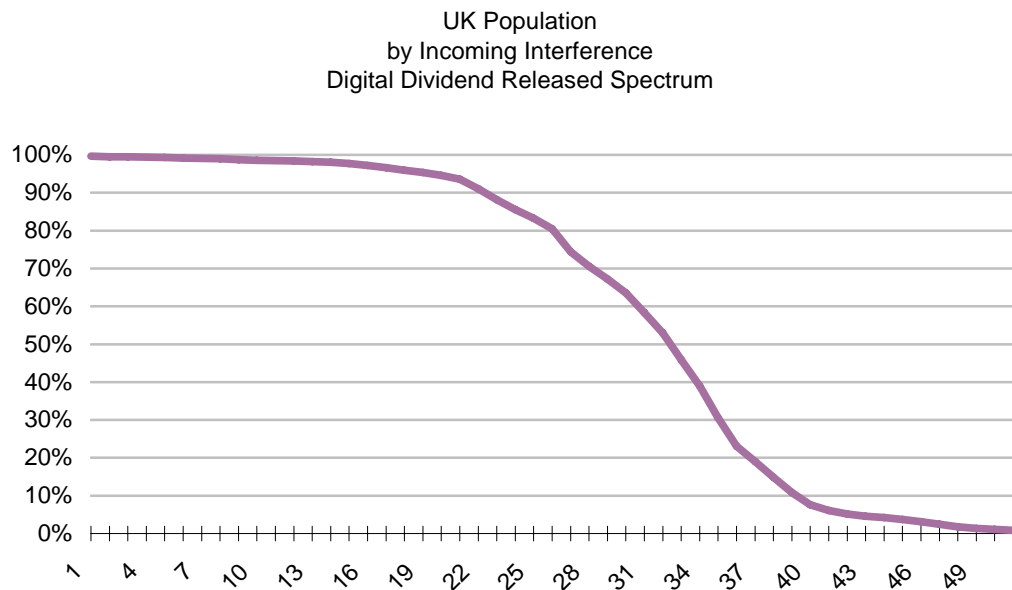
UK Population
by Incoming Interference
Digital Dividend Released Spectrum



**Figure D.18: Incoming Interference by Population
UHF Channel 32 (558-566 MHz)**

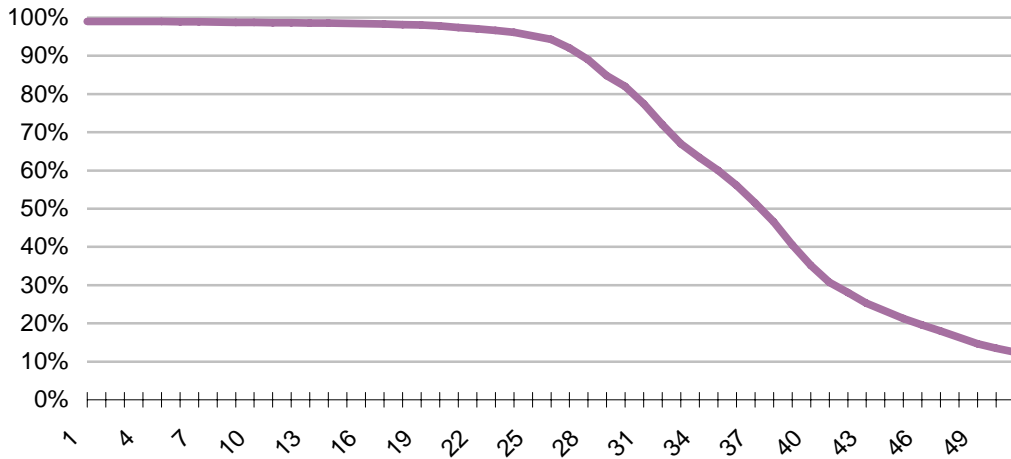


**Figure D.19: Incoming Interference by Population
UHF Channel 33 (566-574 MHz)**



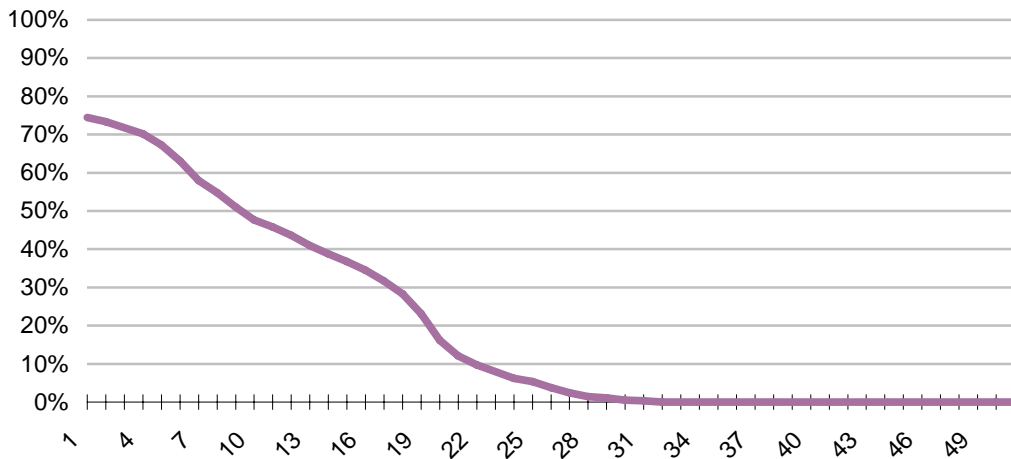
**Figure D.20: Incoming Interference by Population
UHF Channel 34 (574-582 MHz)**

UK Population
by Incoming Interference
Digital Dividend Released Spectrum

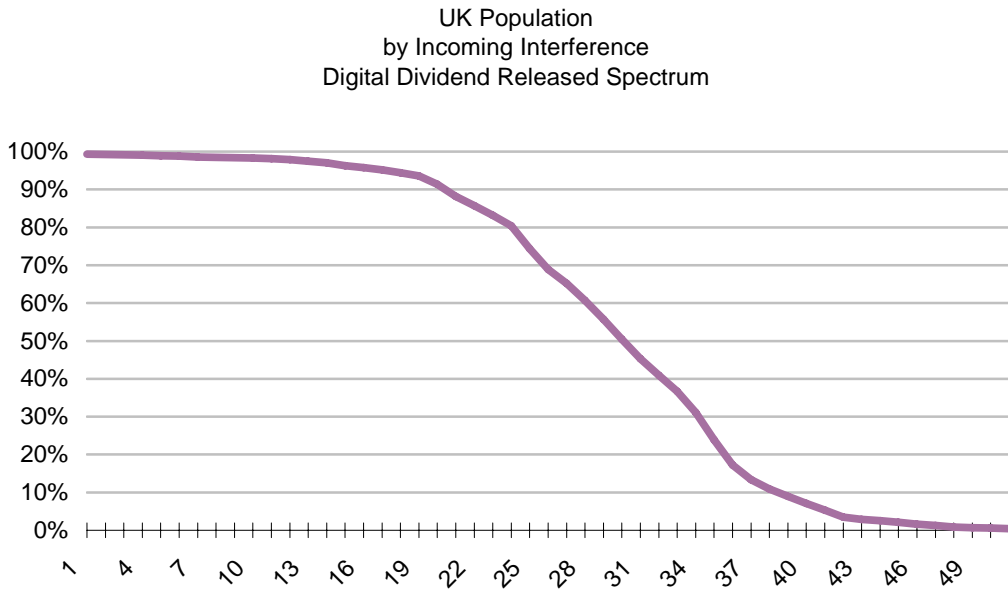


**Figure D.21: Incoming Interference by Population
UHF Channel 35 (582-590 MHz)**

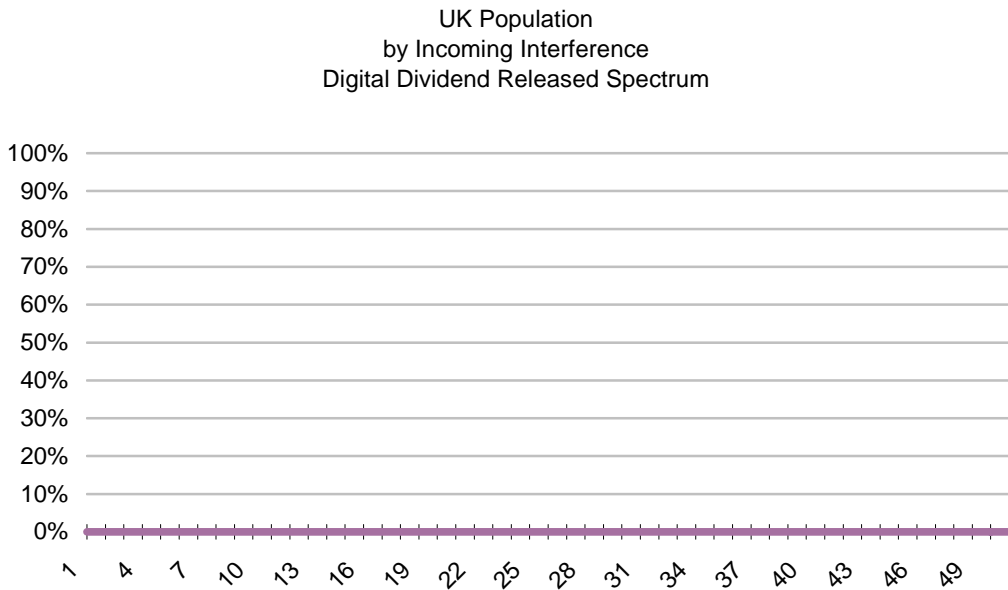
UK Population
by Incoming Interference
Digital Dividend Released Spectrum



**Figure D.22: Incoming Interference by Population
UHF Channel 36 (590-598 MHz)**

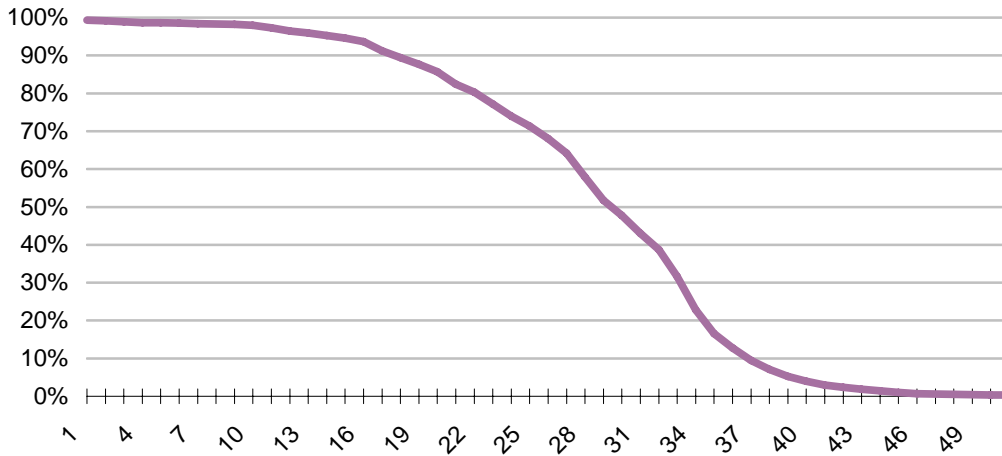


**Figure D.23: Incoming Interference by Population
UHF Channel 37 (598-606 MHz)**



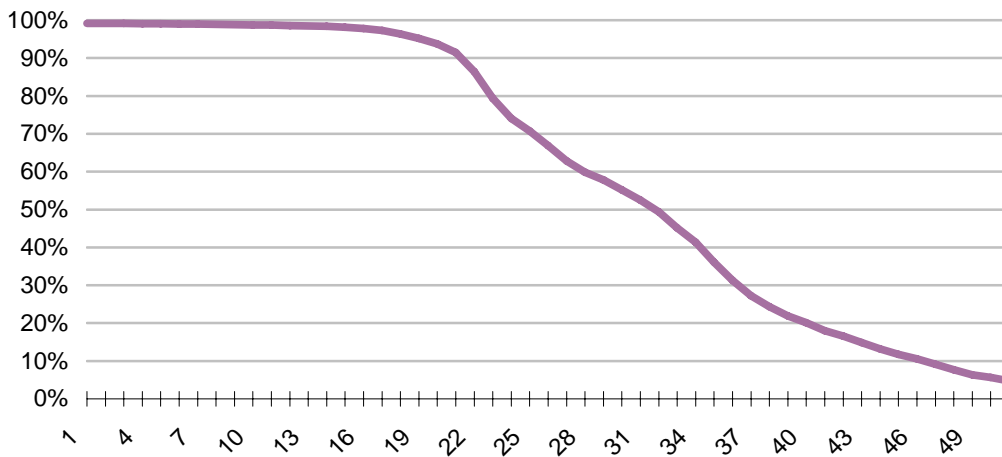
**Figure D.24: Incoming Interference by Population
UHF Channel 38 (606-614 MHz)**

UK Population
by Incoming Interference
Digital Dividend Released Spectrum

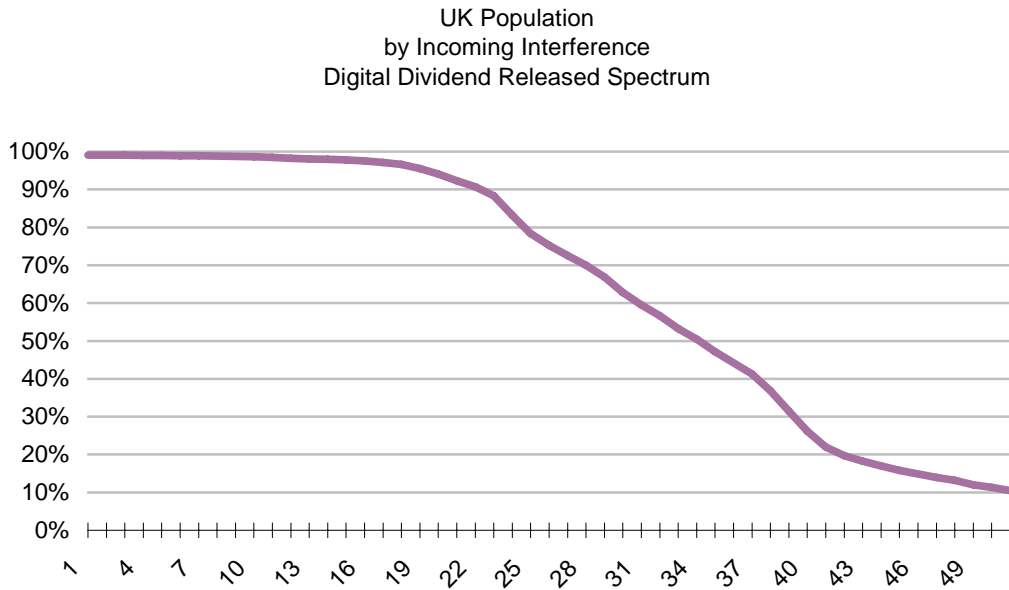


**Figure D.25: Incoming Interference by Population
UHF Channel 39 (614-622 MHz)**

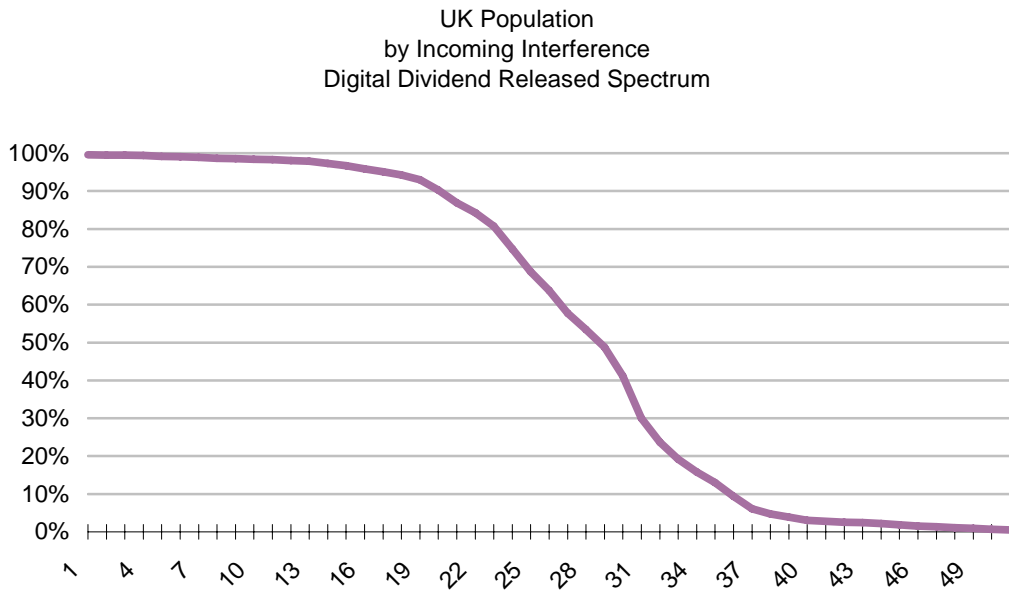
UK Population
by Incoming Interference
Digital Dividend Released Spectrum



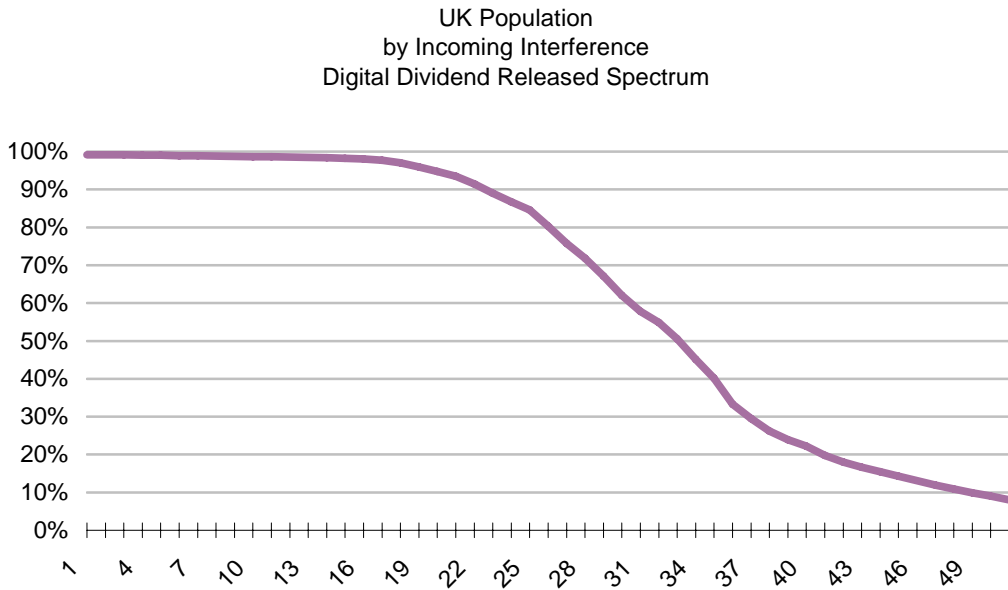
**Figure D.26: Incoming Interference by Population
UHF Channel 40 (622-630 MHz)**



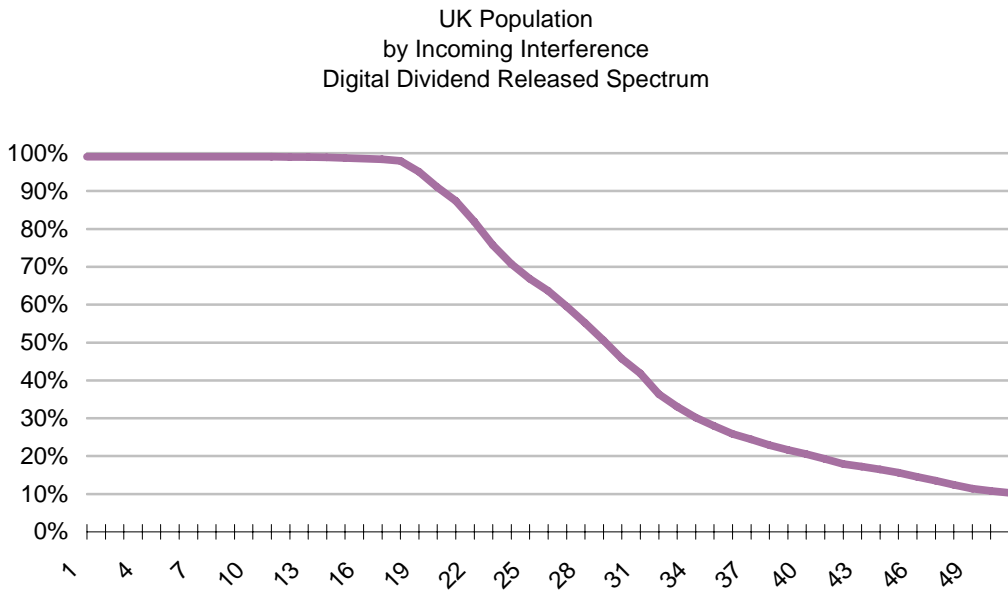
**Figure D.27: Incoming Interference by Population
UHF Channel 63 (806-814 MHz)**



**Figure D.28: Incoming Interference by Population
UHF Channel 64 (814-822 MHz)**

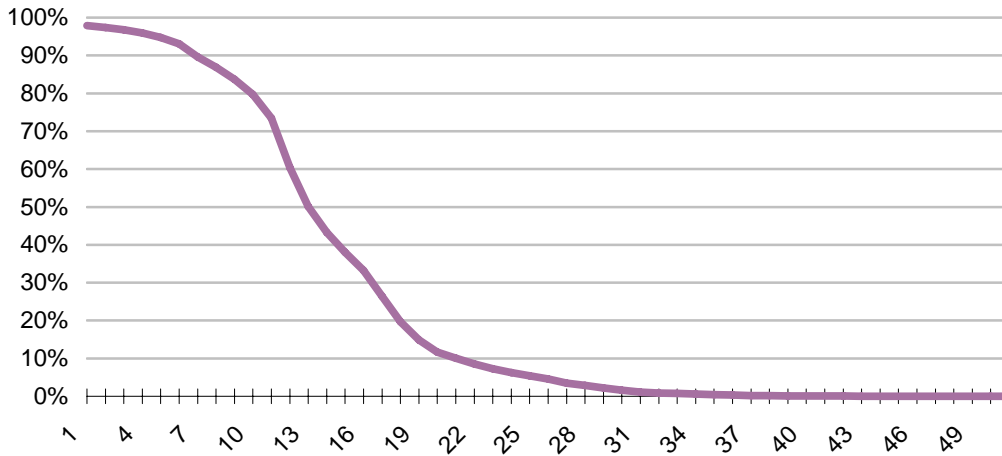


**Figure D.29: Incoming Interference by Population
UHF Channel 65 (822-830 MHz)**



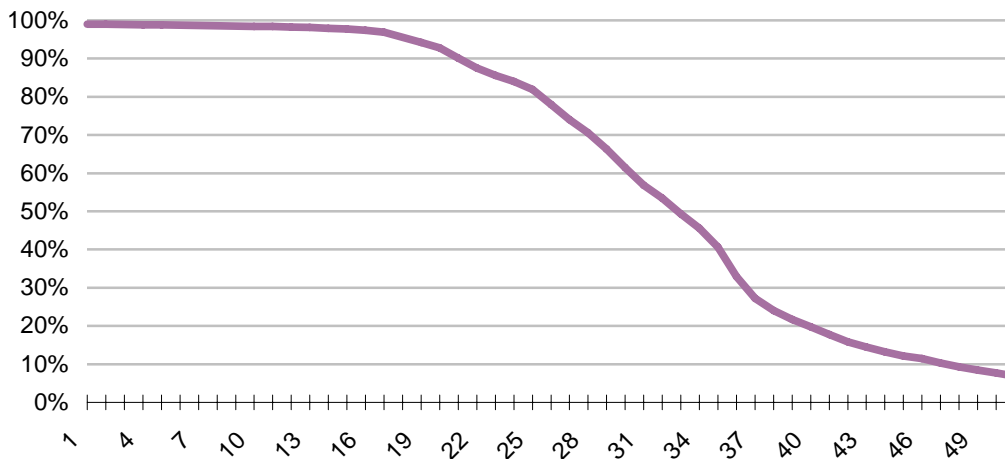
**Figure D.30: Incoming Interference by Population
UHF Channel 66 (830-838 MHz)**

UK Population
by Incoming Interference
Digital Dividend Released Spectrum



**Figure D.31: Incoming Interference by Population
UHF Channel 67 (838-846 MHz)**

UK Population
by Incoming Interference
Digital Dividend Released Spectrum



**Figure D32: Incoming Interference by Population
UHF Channel 68 (846-854 MHz)**