
Digital Switchover (DSO) Programme

Radio DSO Block 10B Manchester

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1.1	23/11/10	Updated version following discussions within PWG
1.2	25/11/10	Updated with comments from Ofcom regarding case definitions

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1 Manchester DSO narrative

The current Manchester local licence transmits on Block 11C and consists of two transmission sites. It is proposed in the new Ofcom block allocation plan to re-channel to 10B.

The current block 11C allocations are shown below figure 1.1 and the proposed 10B allocations in figure 1.2

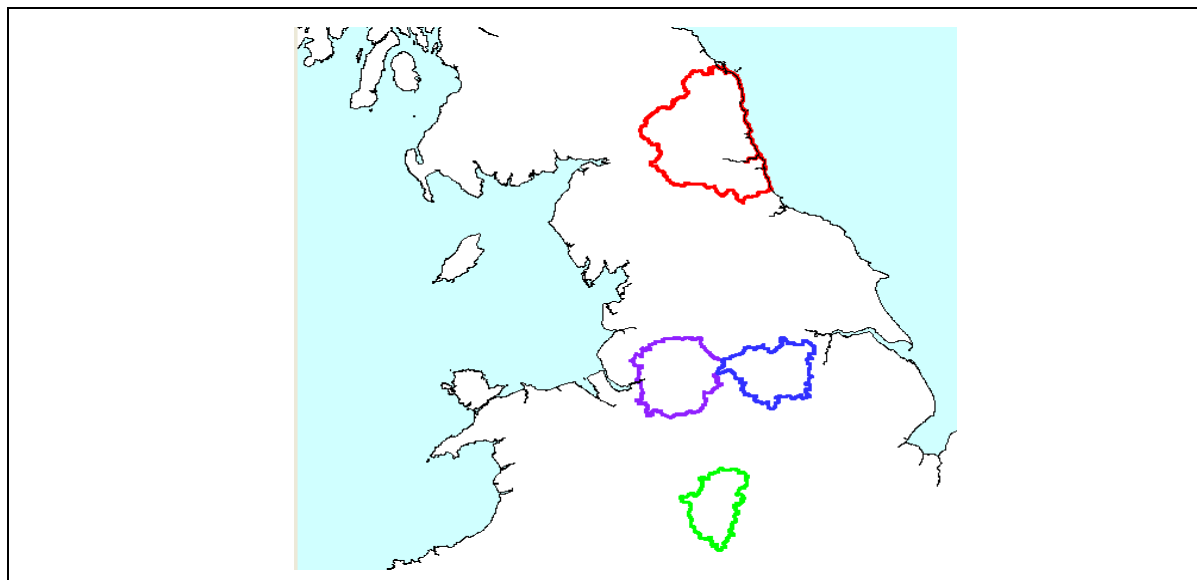


Figure 1.1: Current 11C block allocations

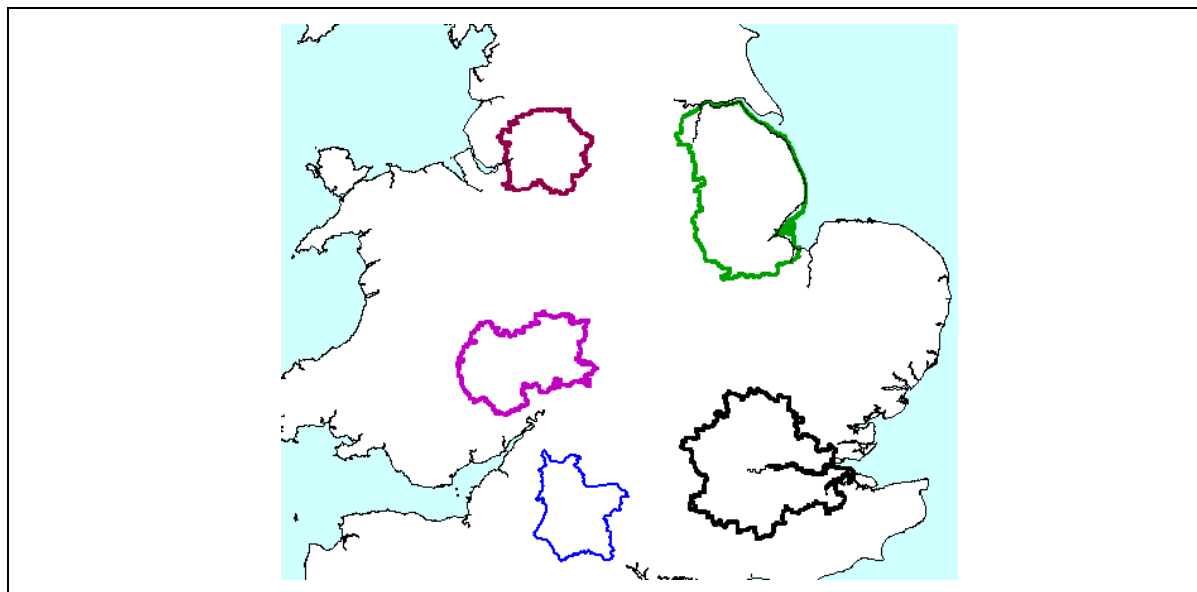


Figure 1.2: Proposed Block 10B allocations

In planning for each multiplex Ofcom have required coverage assessments:

- For each area four maps should be produced as follows:
 1. **Current Situation** - Map showing current actual coverage (or launch plans where a mux hasn't yet launched), including any transmitters which are required as part of the current licence, but which are not yet operational.
 2. **Modified Network 1** - Map showing the above, plus any improvements to existing infrastructure..
 3. **Modified Network 2** - Map of the above, plus additional smaller infill transmitters focused on areas where FM coverage is robust.
 4. **Modified Network 3** - Map of the above, plus additional transmitters to provide near universal coverage.

For case 1: Current situation

The current transmission characteristics are:

Site name	ERP	Site height m.a.s.l	Antenna height a.g.l	Antenna type
Winter Hill	250W	438	31	Cardioid
Sunley Building	500W	44	123	Dipoles

The low antenna height and ERP at Winter Hill were required to protect the Birmingham and South Yorkshire coverage and overspill areas. This severely constrained what was possible in terms of coverage. The coverage for the current situation is given in figure 2.1

For case 2: Modified network 1

In this case Winter Hill has been modified by increasing the ERP to 2kW and raising the antenna height to 120m a.g.l. This significantly improves the coverage over the whole multiplex. This improvement in coverage is shown in figure 2.2

For case 3: Modified network 2

10 smaller sites have been added to provide additional infill coverage focused on areas where FM reception is robust. This is shown in figure 2.3.

For case 4: Modified network 3

To achieve near universal coverage a total of 15 sites were added of which two sites are for mobile coverage only. This is shown in figure 2.4.

In addition an option of using the Winter Hill national antenna and Mow Cop has been considered. This maximises the use of existing infrastructure but does not necessarily respect editorial areas. This coverage is shown in figure 2.5 (and is referred to below as modified network 3a).

Some additional notes:

In the original licence application Sutton Common was listed as a site to be built. This has been included in this document. Mow Cop can be considered an equivalent site to Sutton Common if the question of editorial overlaps is not considered an issue.

There are two main options contained within this document:

- Maintaining editorial overlaps as much as possible, where a modified Winter Hill local antenna is used in conjunction with the use of Sutton Common.
- A more cost effective option of using the Winter Hill national antenna and Mow Cop. This option re-uses in-use antenna systems. However it will give a significant overlap into Central Lancashire and Stoke multiplex areas.

There are a number of sites which are used to 'fill' the multiplex but which are also in an overlap with neighbouring multiplexes and could be used for one or the other or even both. Consideration should be given to the allocation of these sites. The sites are listed below:

- Whitworth - Could be used for Central Lancashire
- Mow Cop - Allowed for Stoke and could be used for Manchester
- Beech Hill - Could be used for Stoke

1.1 Outgoing interference and sensitivity to other co-block multiplexes

London and West Wiltshire are largely unaffected by the DSO proposal contained within this document. There is a minor impact to Hereford & Worcester. However predictions indicate that Lincolnshire is significantly affected by the DSO proposals at 1% time with significantly less impact at 5% time. This is mainly in the northern parts of the Lincolnshire multiplex where it forms an overlap with the Humberside multiplex. Even under continuous interference (50% time), some parts of the multiplex will be affected.

2 Coverage of the Multiplex

2.1 Coverage Maps

Coverage maps for DAB are presented with three colours:

Blue = Mobile coverage (99% locations at 99% time)

Dark Green = Indoor coverage (80-95% locations at 99% time)

Light Green = Robust indoor coverage (>95% locations at 99% time)

These maps are layered with indoor overlaying outdoor coverage. It should be noted for coverage maps where a modified existing local antenna at Winter Hill is used this is ‘paired’ with the use of Sutton Common. For coverage maps where the national DAB antenna is used at Winter Hill this is ‘paired’ with Mow Cop. This represents maximum use of existing infrastructure with the highest coverage but which does not deliberately respect editorial boundaries.

Figure 2.1	Current interference limited coverage (Block 11C)
Figure 2.2	Modified network 1: Coverage of multiplex with modifications to existing infrastructure (new modified local antenna system)
Figure 2.3	Modified network 2
Figure 2.4	Modified network 3: using modified local antenna at Winter Hill and Sutton Common
Figure 2.5	Modified network 3a: using national antenna at Winter Hill and Mow Cop

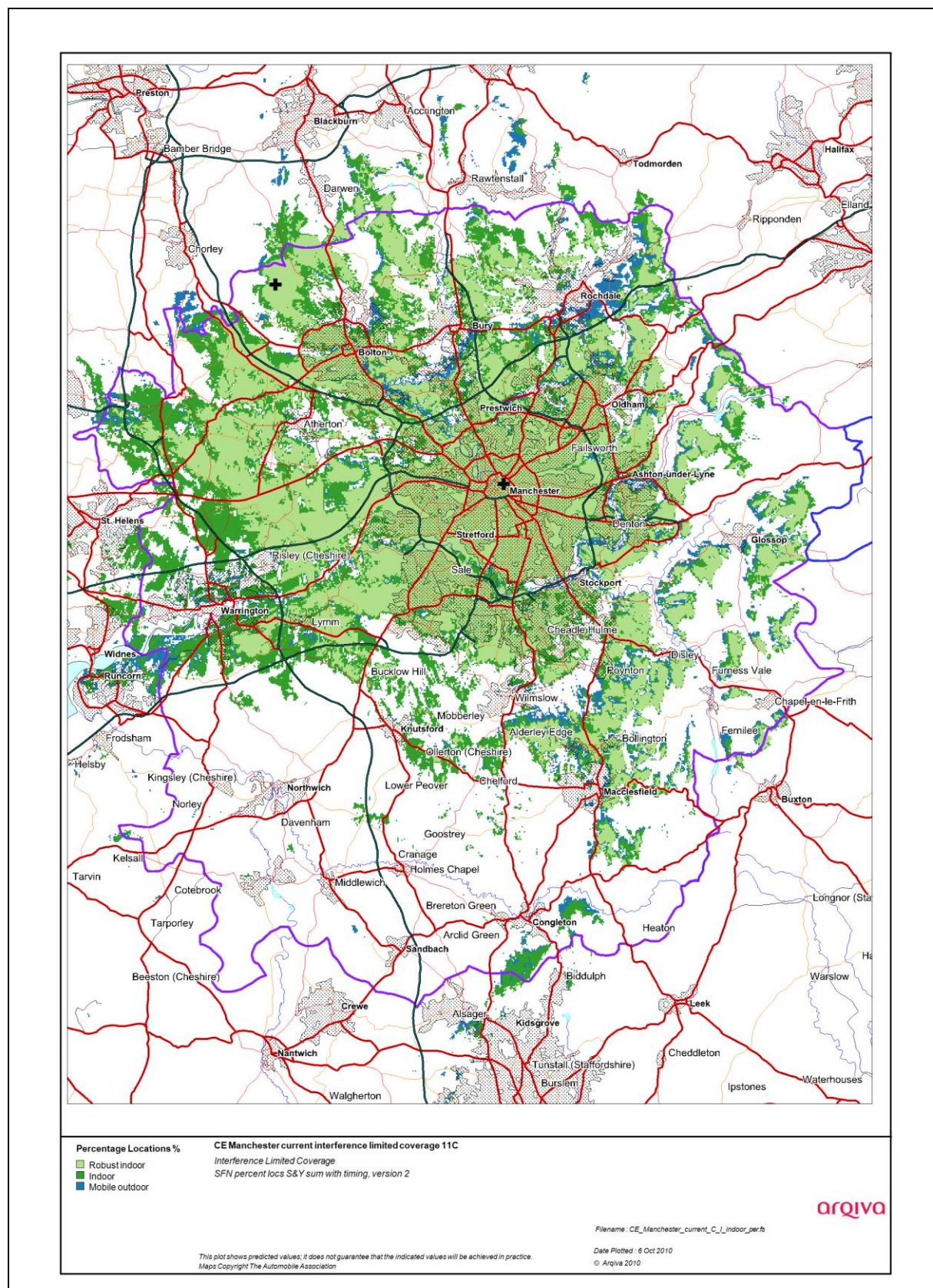


Figure 2-1. Current interference limited coverage (Block 11C)

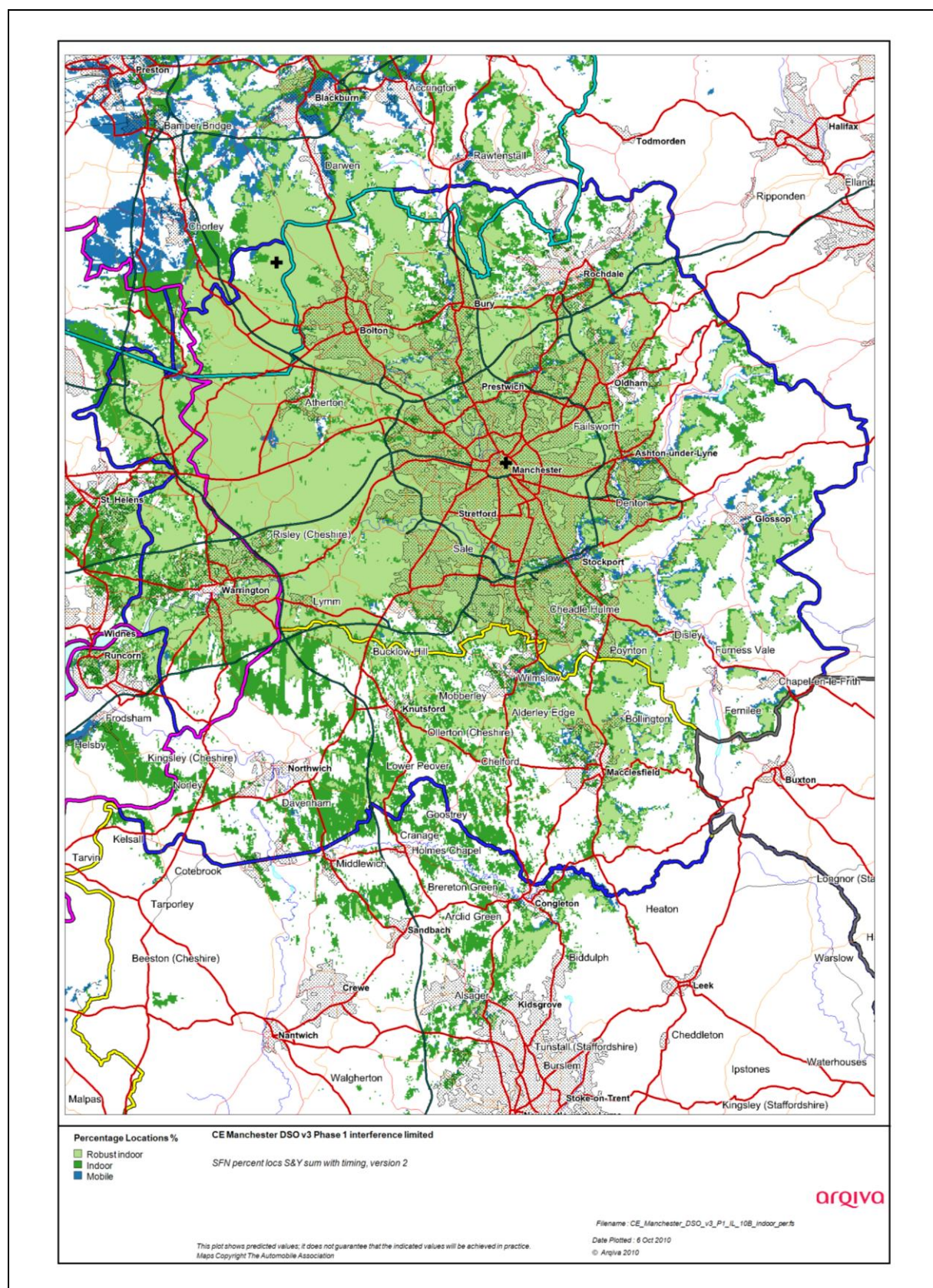


Figure 2-2. Modified network 1

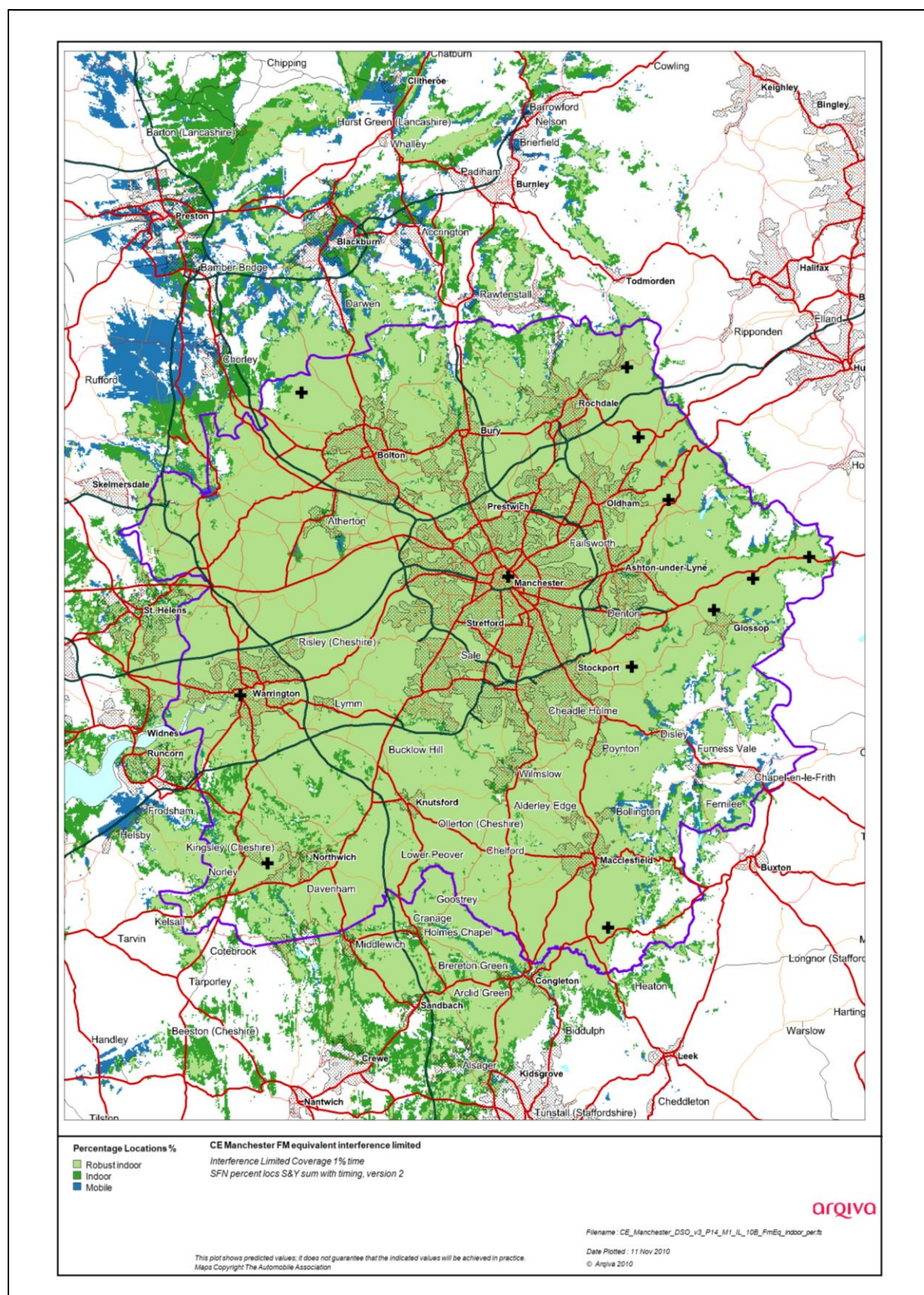


Figure 2-3. Modified network 2

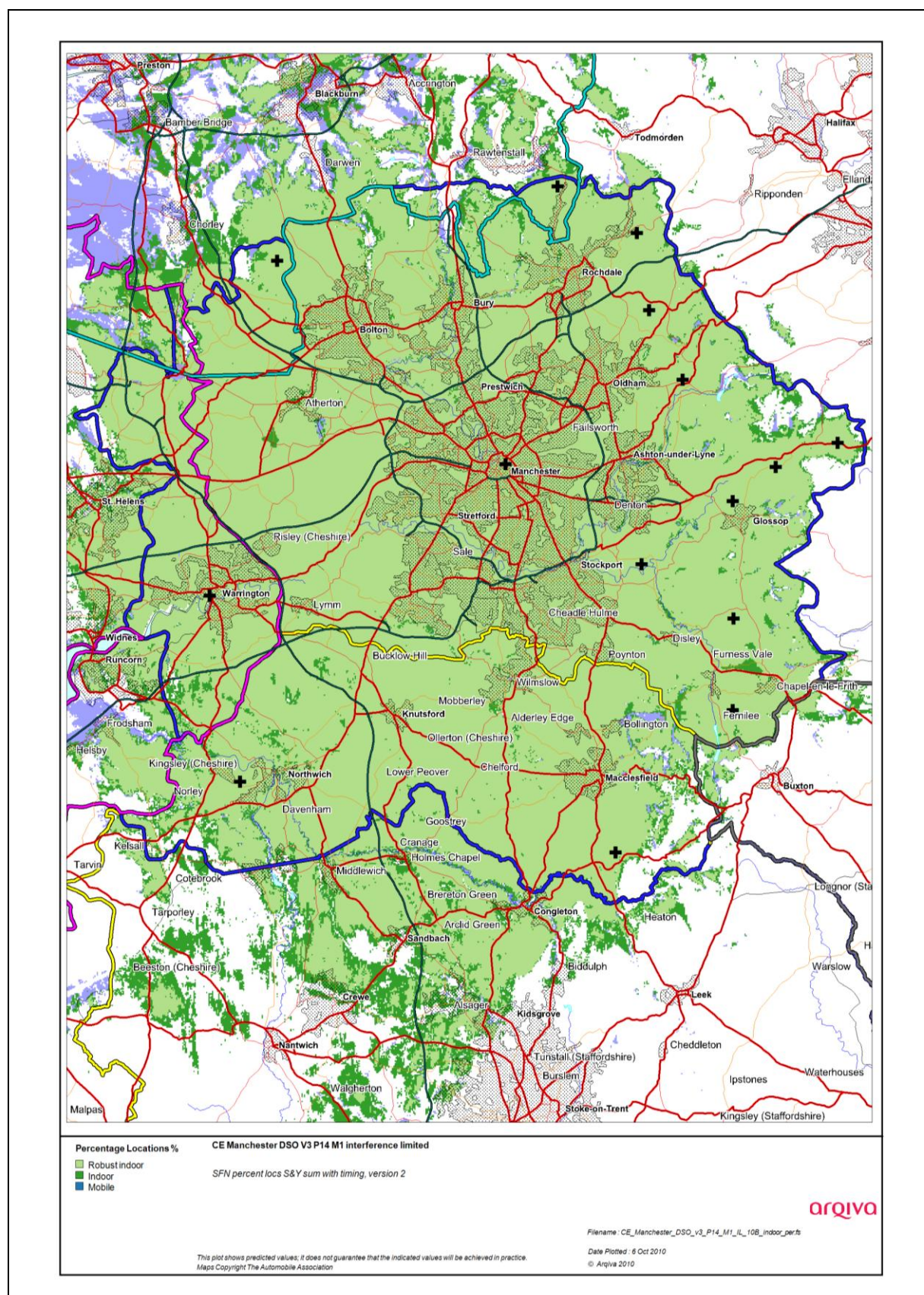


Figure 2-4. Modified network 3

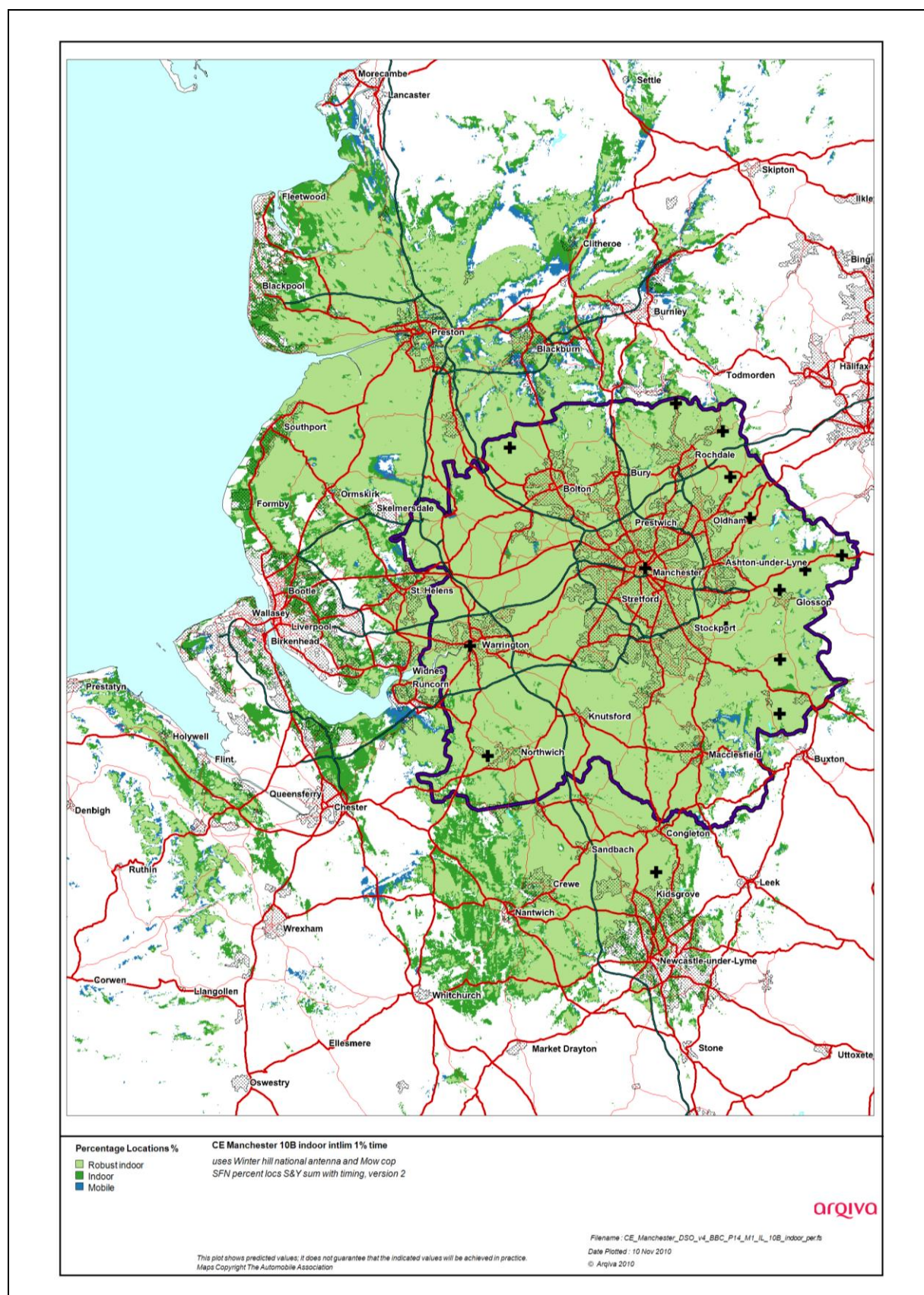


Figure 2-5. Modified network 3a

2.2 Population Coverage tables within Editorial Area*Table 2-1. Population coverage proportional indoor; modified Winter Hill antenna**: Total 1422375 households*

Site scenario and incremental additional sites	Site type	Individual gross interference limited coverage within Editorial Area	Total number of households within Editorial Area	Incremental increase in number of households	Incremental percentage increase of population	Percentage of Editorial Area
Current (11C)			944951	-	-	66.4
Sunley building (10B)	Current	570,188 (40.1%)	-	-	-	-
Current Winter Hill (10B)	Current	843,097 (59.27%)				
Modified Winter Hill local antenna	Existing site new antenna	996,794 (70.08%)	1177251	232299	16.3	82.8
Sutton Common	Existing site new shared antenna	270,498 (19.02%)	1268439	91189	6.4	89.2
Saddleworth	New site	387,691 (27.2%)	1315356	46917	3.3	92.5
Glossop	New site	24,918 (1.75%)	1336790	21434	1.5	94.0
Beech Hill	New site	16,776 (1.18%)	1348375	11585	0.8	94.8
Crompton Moor	New site	558,137 (39.24%)	1378592	30217	2.1	96.9
Warrington	New site	74,738 (5.25%)	1383220	4628	0.3	97.2
Ladder Hill	New site	34,274 (2.41%)	1396435	13215	0.9	98.2
Romiley	New site	101,029 (7.10%)	1399240	2805	0.2	98.4
Birch Vale	New site	29,508 (2.07%)	1403219	3979	0.3	98.7
Littleborough	Existing in use site	47,648 (3.35%)	1406206	2987	0.2	98.9
Whitworth	New site	26,347 (1.85%)	1409053	2847	0.2	99.1
Torhead reservoir (mobile only)	New site	27 (0%)	1409080	27	0.0	99.1
Woodhead reservoir (mobile only)	New site	5 (0%)	1409080	0	0.0	99.1

Case 1 - Light yellow = current coverage (Sunley + current Winter Hill)

Case 2 - Light yellow +Purple= modified infrastructure

Case 3 - Light yellow +Purple + Orange + Light Blue = Case 3

Case 4 - Light yellow +Purple + Orange + Light Blue + Green= Full plan

Light Blue indicates site which was in original licence award

Table 2-2 Population coverage proportional indoor; Winter Hill national antenna and Mow Cop replacing Sutton Common: Total 1422375 households

Site scenario and incremental additional sites	Site type	Individual gross interference limited coverage within Editorial Area	Total number of households within Editorial Area	Incremental increase in number of households	Incremental percentage increase of population	Percentage of Editorial Area
Current (11C)			944951	-	-	66.4
Sunley building (10B)	Current	570,188 (40.1%)	-	-	-	-
Current Winter Hill (10B)	Current	843,097 (59.27%)	-	-	-	-
Winter Hill national antenna	Existing site new antenna	1,007,794 (70.83%)	1,186,582	241,631	17.02	83.42
Saddleworth	New site	387,691 (27.2%)	1,261,302	74,720	5.26	88.68
Mow Cop	Existing in use site	76,921 (5.41%)	1,317,644	56,342	3.96	92.64
Glossop	New site	24,918 (1.75%)	1,339,650	22,006	1.54	94.18
Crompton Moor	New site	558,137 (39.24%)	1,373,470	33,820	2.38	96.56
Romiley	New site	101,029 (7.10%)	1,379,244	5,774	0.11	96.67
Ladder Hill	New site	34,274 (2.41%)	1,393,014	13,770	1.27	97.94
Warrington	New site	74,738 (5.25%)	1,396,723	3,709	0.26	98.2
Beech Hill	New site	16,776 (1.18%)	1,400,031	3,308	0.23	98.43
Birch Vale	New site	29,508 (2.07%)	1,404,383	4,352	0.31	98.74
Littleborough	Existing in use site	47,648 (3.35%)	1,407,320	2,937	0.2	98.94
Whitworth	New site	26,347 (1.85%)	1,410,057	2,737	0.19	99.13
Torhead reservoir (mobile only)	New site	27 (0%)	1,410,082	25	0.01	99.14
Woodhead reservoir (mobile only)	New site	5 (0%)	1,410,086	5	0.0	99.14

Case 1 - Light yellow = current coverage (Sunley + current Winter Hill)

Case 2 - Light yellow +Purple= modified infrastructure

Case 3 - Light yellow +Purple + Orange + Light Blue = Case 3

Case 4 - Light yellow +Purple + Orange + Light Blue + Green= Full plan

Light Blue indicates is a site which can be considered as equivalent to that required in original licence award

Table 2-3. Road coverage 99% location 99% Winter Hill modified antenna: Total roads 1693.6km

Site scenario and incremental additional sites	Site type	Total road length In km	Increase in road length in km	Incremental percentage of road length	Percentage of roads within Editorial Area
Current (11C)		935.4			55.22
Modified Winter Hill local antenna	Existing site new antenna	1141.8	206.4	12.19	67.41
Sutton Common	Existing site new shared antenna	1331.2	189.4	11.18	78.59
Saddleworth	New site	1411.5	80.3	4.74	83.33
Glossop	New site	1446.1	34.6	2.04	85.38
Beech Hill	New site	1493.7	47.6	2.81	88.19
Crompton Moor	New site	1552.3	58.6	3.46	91.65
Warrington	New site	1561.3	9.0	0.53	92.18
Ladder Hill	New site	1595.4	34.1	2.01	94.19
Romiley	New site	1599.8	4.4	0.26	94.45
Birch Vale	New site	1610.8	11.0	0.65	95.10
Littleborough	Existing in use site	1615.6	4.8	0.28	95.38
Whitworth	New site	1619.9	4.3	0.25	95.64
*Torhead reservoir	New site	1624.2	4.3	0.25	95.89
*Woodhead reservoir	New site	1629.9	5.7	0.34	96.23

Case 1 - Light yellow = current coverage (Sunley + current Winter Hill)

Case 2 - Light yellow +Purple= modified infrastructure

Case 3 - Light yellow +Purple + Orange + Light Blue = Case 3

Case 4 - Light yellow +Purple + Orange + Light Blue + Green= Full plan

Light Blue indicates which was in original licence award

* These sites are required for road coverage only, however it is recommended that a road survey is carried out. These sites are in a steep sided valley and DAB may work without building these sites or Holme Moss may be suitable (predictions indicate not).

*Table 2-4. Road coverage 99% location 99% Winter Hill national antenna and Mow Cop:
Total roads 1693.6km*

Site scenario and incremental additional sites	Site type	Total road length In km	Increase in road length in km	Incremental percentage of road length	Percentage of roads within Editorial Area
Current (11C)		935.4			55.22
Modified Winter Hill national antenna	Existing site new antenna	1170.4	235	13.88	69.10
Saddleworth	New site	1277.4	107	6.32	75.42
Mow Cop	Existing in use site	1424.6	147.2	8.69	84.11
Glossop	New site	1459.4	34.8	2.05	86.16
Crompton Moor	New site	1525.7	66.3	3.92	90.08
Romiley	New site	1535.3	9.6	0.56	90.64
Ladder Hill	New site	1572.4	37.1	2.19	92.83
Warrington	New site	1578.9	6.5	2.19	93.22
Beech Hill	New site	1598.5	19.6	1.15	94.37
Birch Vale	New site	1608.2	9.7	0.58	94.95
Littleborough	Existing in use site	1612.5	4.3	0.25	95.20
Whitworth	New site	1616.3	3.8	0.22	95.42
*Torhead reservoir	New site	1620.3	4	0.24	95.66
*Woodhead reservoir	New site	1627.7	7.4	0.44	96.10

Case 1 - Light yellow = current coverage (Sunley + current Winter Hill)

Case 2 - Light yellow +Purple= modified infrastructure

Case 3 - Light yellow +Purple + Orange + Light Blue = Case 3

Case 4 - Light yellow +Purple + Orange + Light Blue + Green= Full plan

Light Blue indicates which was in original licence award

* These sites are required for road coverage only, however it is recommended that a road survey is carried out. These sites are in a steep sided valley and DAB may work without building these sites or Holme Moss may be suitable (predictions indicate not).

Table 2-5 Summary of coverage within Editorial Area for each case using Modified Winter Hill antenna

Case	Indoor (households)	Indoor (percentage of Editorial Area)	Mobile (in km within Editorial Area)	Mobile (percentage of roads within Editorial Area)
1	944,951	66.4	935.4	55.22
2	1,177,251	82.8	1141.8	67.41
3	1,389,660	97.7	15837	93.5
4	1,409,080	99.1	1629.9	96.23

Table 2-6. Summary of coverage within Editorial Area for each case using the National antenna at Winter Hill

Case	Indoor (households)	Indoor (percentage of Editorial Area)	Mobile (in km within Editorial Area)	Mobile (percentage of roads within Editorial Area)
1	944,951	66.4	935.4	55.22
2	1,186,582	83.42	1170.4	69.10
3	1,391,118	97.8	15856	93.6
4	1,410,086	99.14	1627.7	96.10