



Digital Switchover (DSO) Programme

Radio DSO Block 10B Lincolnshire

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Table of Contents

1	Lincolnshire DSO narrative	4
1.1	Outgoing interference and sensitivity to other co-block multiplexes	7
1.2	Incoming interference and sensitivity from other co-block multiplexes	7
2	Coverage of the Multiplex	8
2.1	Coverage Maps	8
2.2	Population Coverage tables within Editorial Area.....	16

1 Lincolnshire DSO narrative

There were three previously allocated transmitters for the Lincolnshire area: Belmont, High Hunsley and Lincoln Hospital. However, these were not implemented. The Lincoln Hospital site was not entirely satisfactory in terms of coverage within the city and an alternative site within Lincoln (Lincoln Clayton Rd) has been incorporated into this study.

The proposed Block 10B allocations are shown below and include Manchester, London, Hereford & Worcester, West Wilts & Salisbury, as well as Lincolnshire.

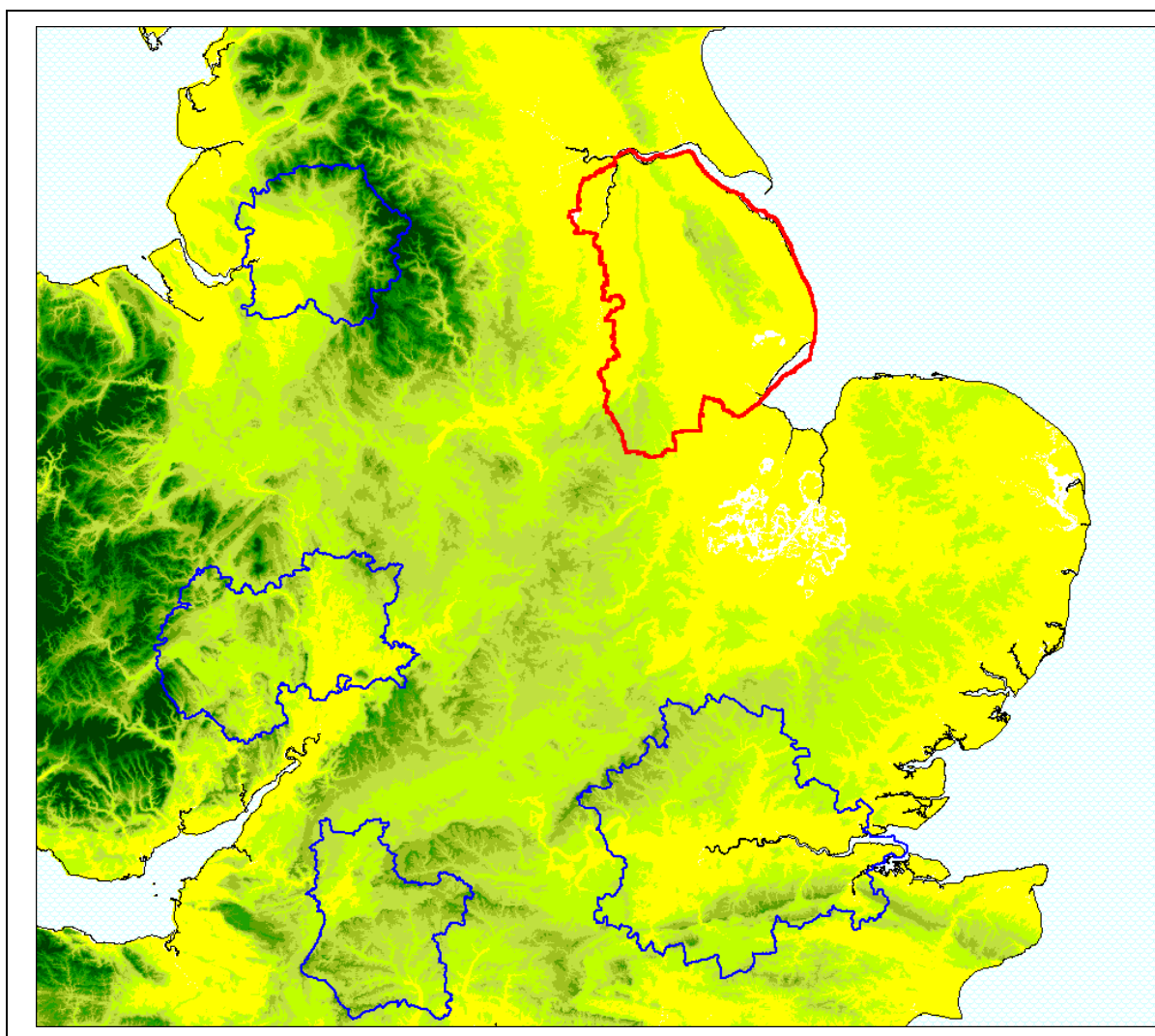


Figure 1.1: Proposed Block 10B allocations

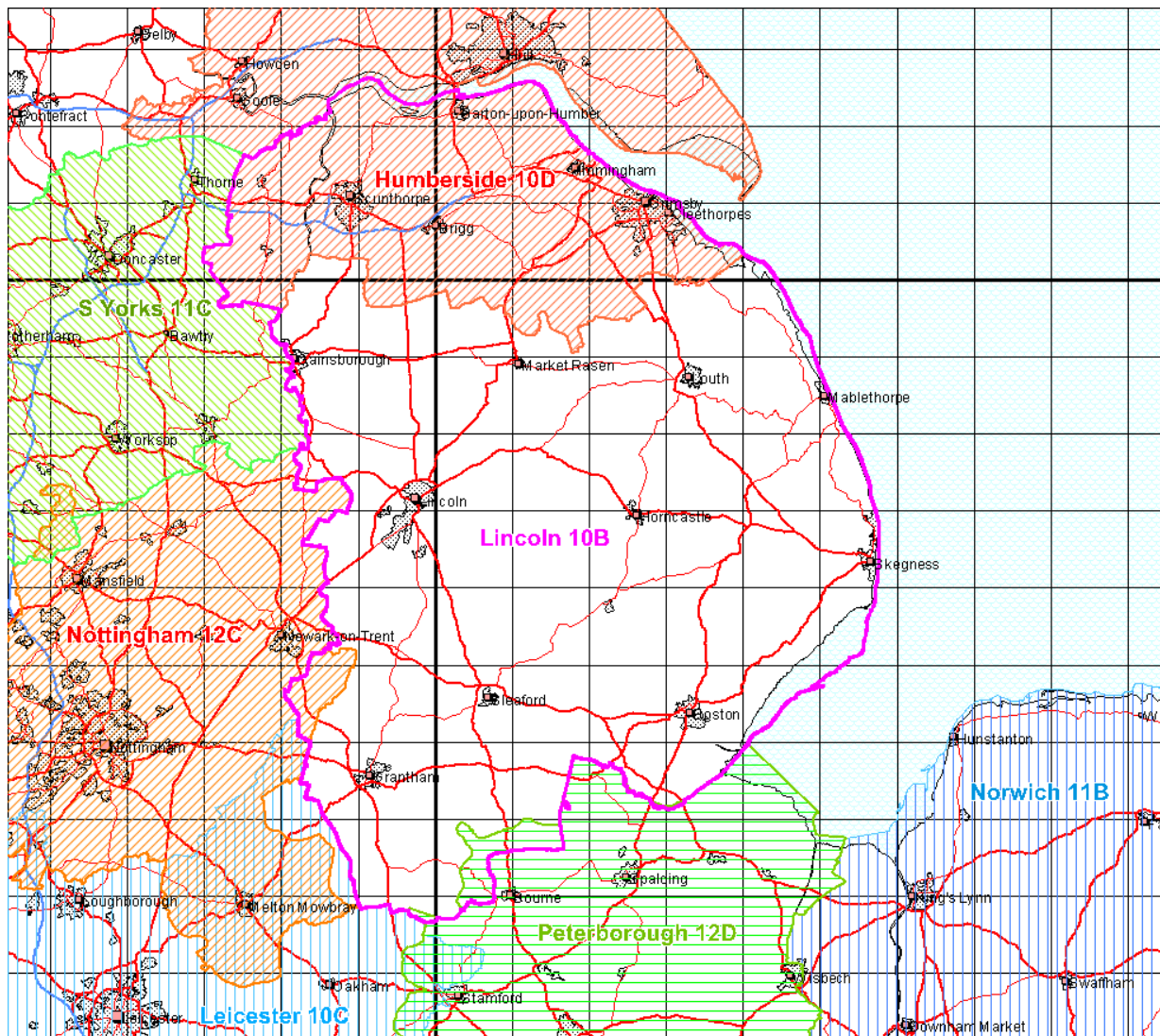


Figure 1-2 Lincoln and Adjacent Editorial Areas

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 original allocations have not been implemented. The three sites – **Belmont**, an existing site using the National infrastructure but using a proposed National modification to the antenna; **High Hunsley**, existing site using the BBC National infrastructure; **Lincoln Clayton Rd Tower**, a new site within Lincoln and an alternative to that previously allocated. Predicted Coverage, within the present Pre-DSO environment, is shown *Figures 1.1 & 1.2*.

For case 2: Modified Network 1

As case 1 except it is now subjected to the 'Post DSO' interference environment. The coverage is shown *Figures 2.3 & 2.4*. Coverage is somewhat less than for Case 1 by virtue of the increased number and levels of co-block interferers.

For case 3: Modified Network 2

In this it was required to cover those areas currently served robustly by local FM services (BBC Local and Independent Lincs FM). To achieve this, 9 sites were required, although even then at 99% time interference coverage falls short of that provided by FM. The coverage of the Modified Network 2 is shown in *Figures 2.5 & 2.6*. Predicted *Indoor* coverage is 93.62% relative to the editorial Area; predicted *Outdoor Road* coverage (1% Time Interference) is 83.2%.

For case 4: Modified Network 3

For this case it was required to 'fill' the multiplex to achieve near universal coverage (within practical planning limits). To achieve this coverage the same 9 sites will be required as Modified Network 2 (as above, *Figures 2.5 & 2.6*).

The Lincolnshire area, being relatively flat, is open to interference primarily from Manchester (10B), but also from London (10B).

Some additional notes:

In considering potential incoming interference, where several scenarios for the Manchester (10B) multiplex exist, the worst case as far as outgoing interference is that where the National Winter Hill antenna is used and this has been used in this analysis for Lincolnshire. However, it should be noted that Manchester (10B) generally affects the northern and central part of the editorial area; in the north, there is an overlap with the adjacent Humberside (10D) multiplex. The London (10B) multiplex proposal affects large areas of the southern and central area.

1.1 Outgoing interference and sensitivity to other co-block multiplexes

West Wiltshire & Salisbury (10B), Hereford & Worcester (10B) and Manchester (10B) are largely unaffected by the DSO proposal contained within this document. There is a minor impact to London (10B) within the editorial area..

1.2 Incoming interference and sensitivity from other co-block multiplexes

Manchester (10B), Winter Hill and Sutton Common are the primary interferers.

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; 'Outdoor Only' coverage is also provided in order to improve clarity

Note that Modified Network 2 and Modified Network 3 Maps are identical.

Figure 2.1	Current Situation
Figure 2.2	Current Situation - 1% time Interference – <i>Outdoor Only</i>
Figure 2.3	Modified Network 1
Figure 2.4	Modified Network 1 – 1% Time Interference <i>Outdoor Only</i>
Figure 2.5	Modified Network 2 & 3
Figure 2.6	Modified Network 2 & 3 – 1% Time Interference <i>Outdoor Only</i>
Figure 2.7	Terrain Map)

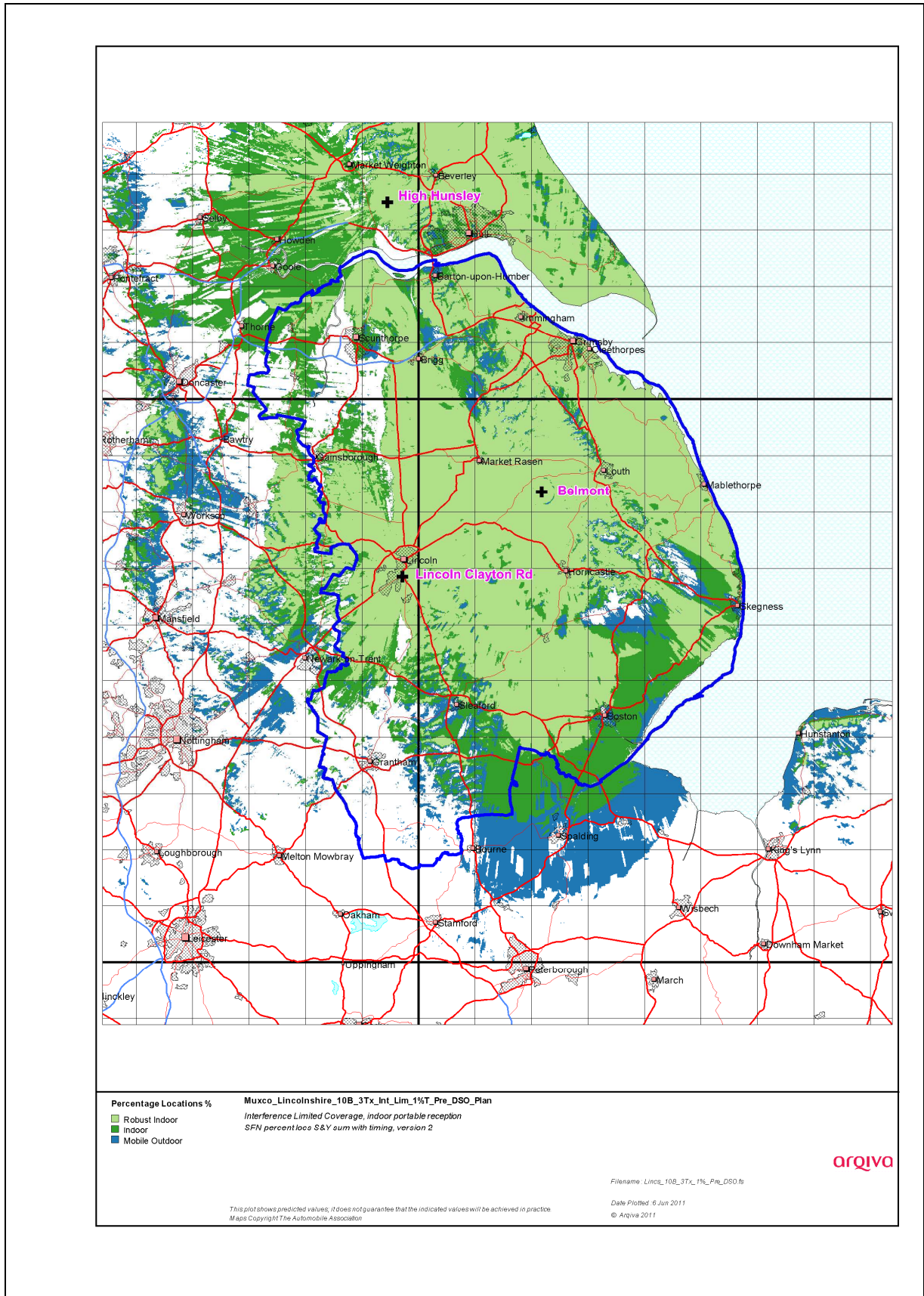


Figure 2-1 Current Situation

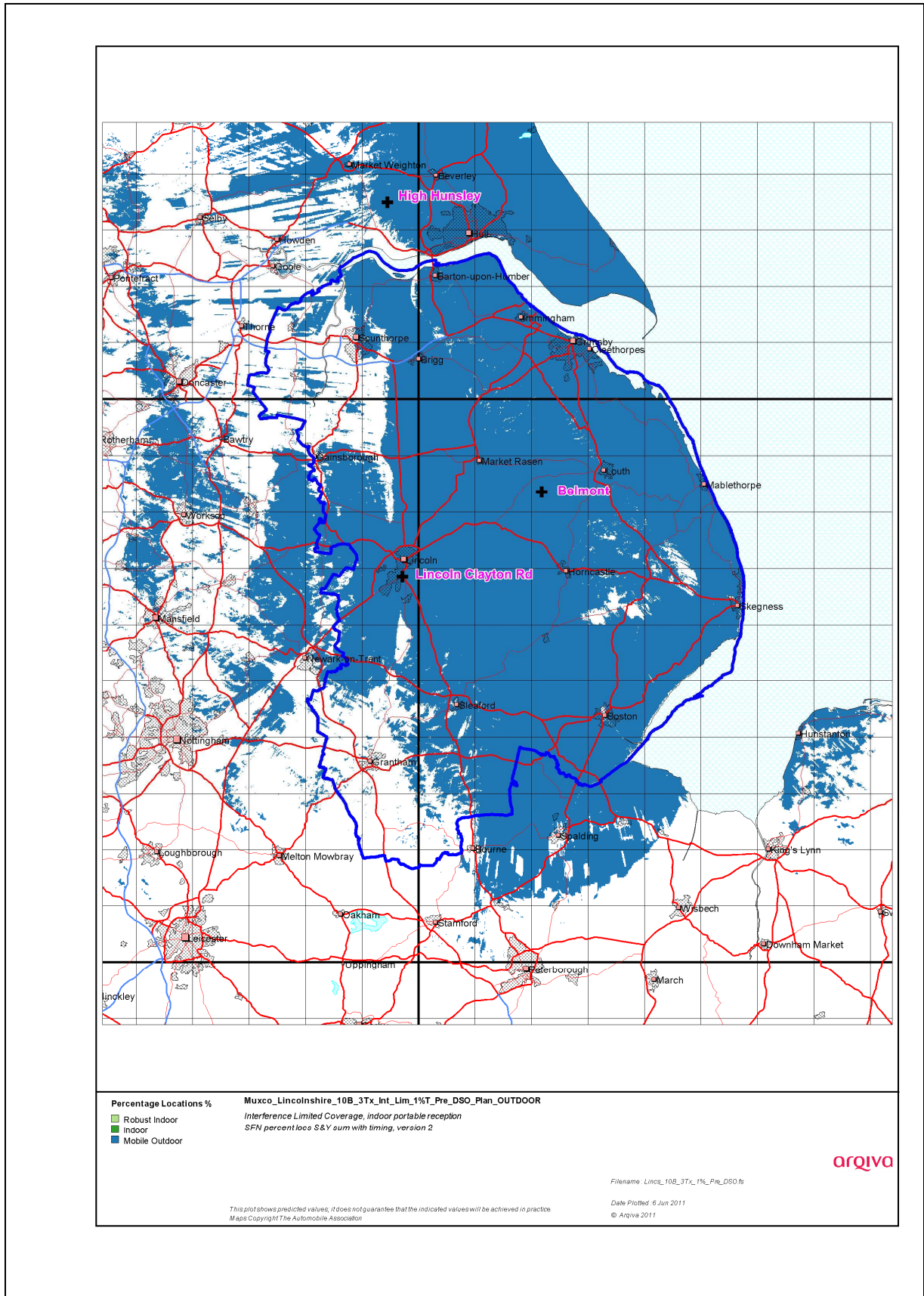


Figure 2-2 Current Situation - 1% time Interference (Outdoor Only)

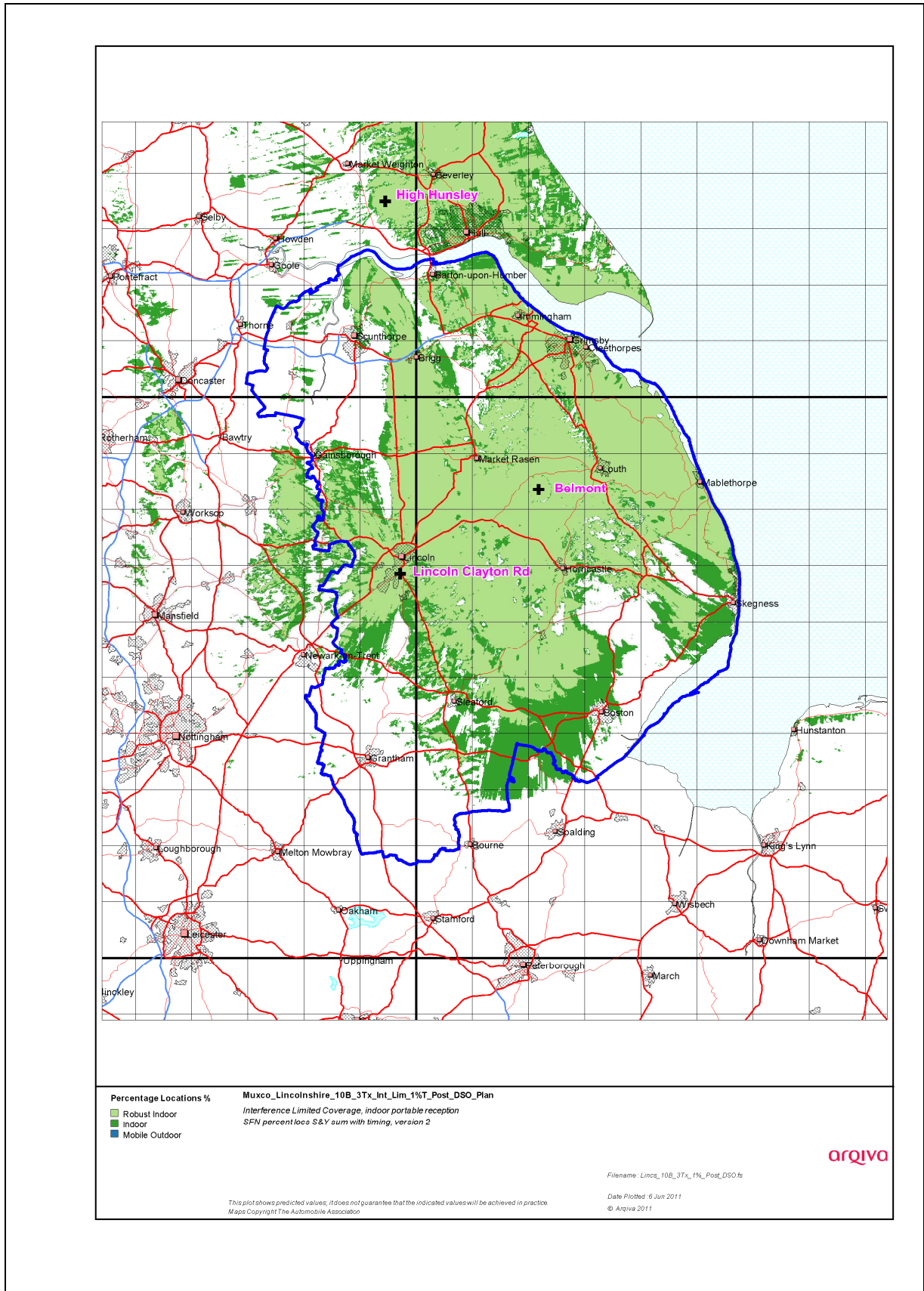


Figure 2-3. Modified Network 1

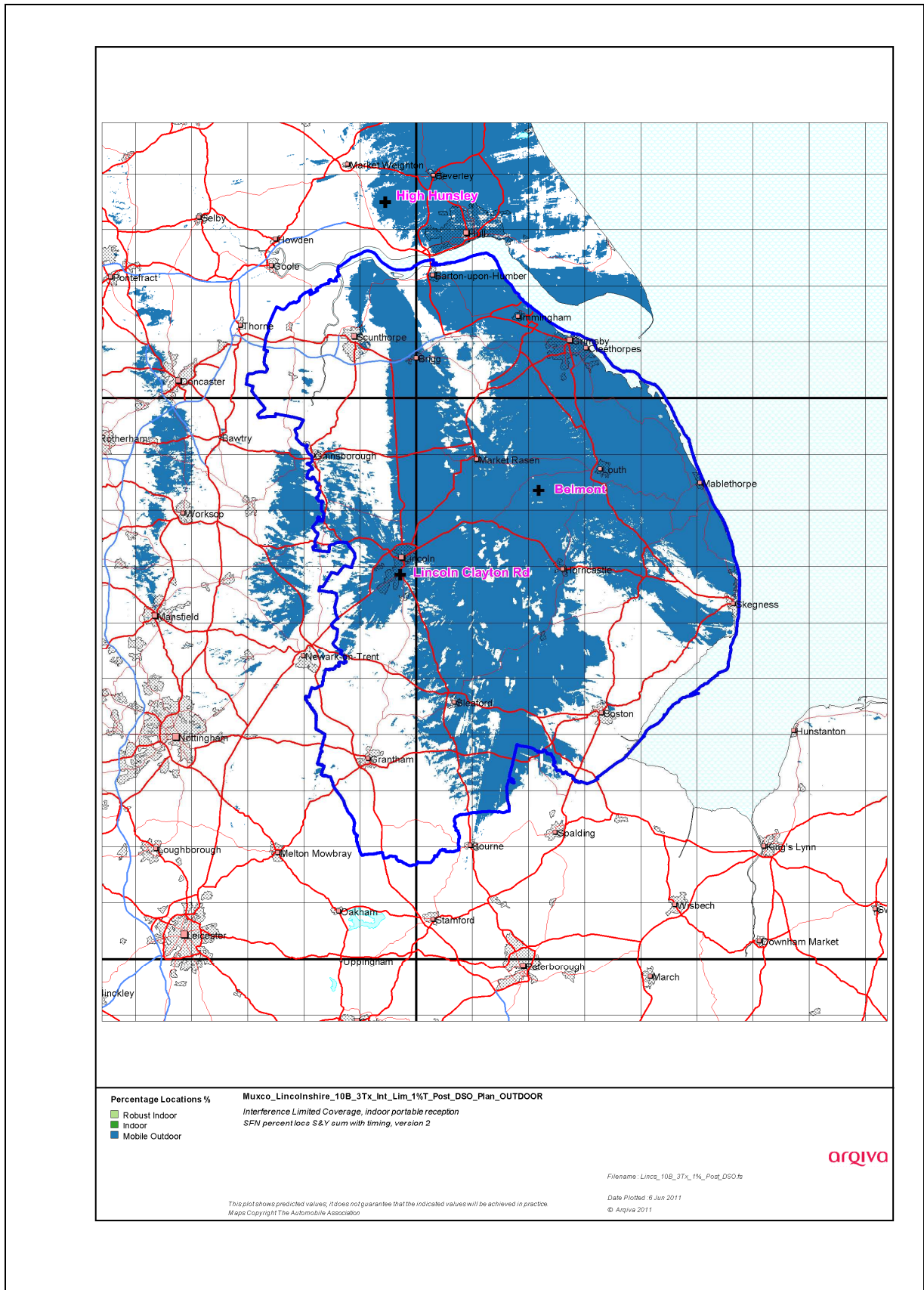


Figure 2-4. Modified Network 1 - 1% time Interference (Outdoor Only)

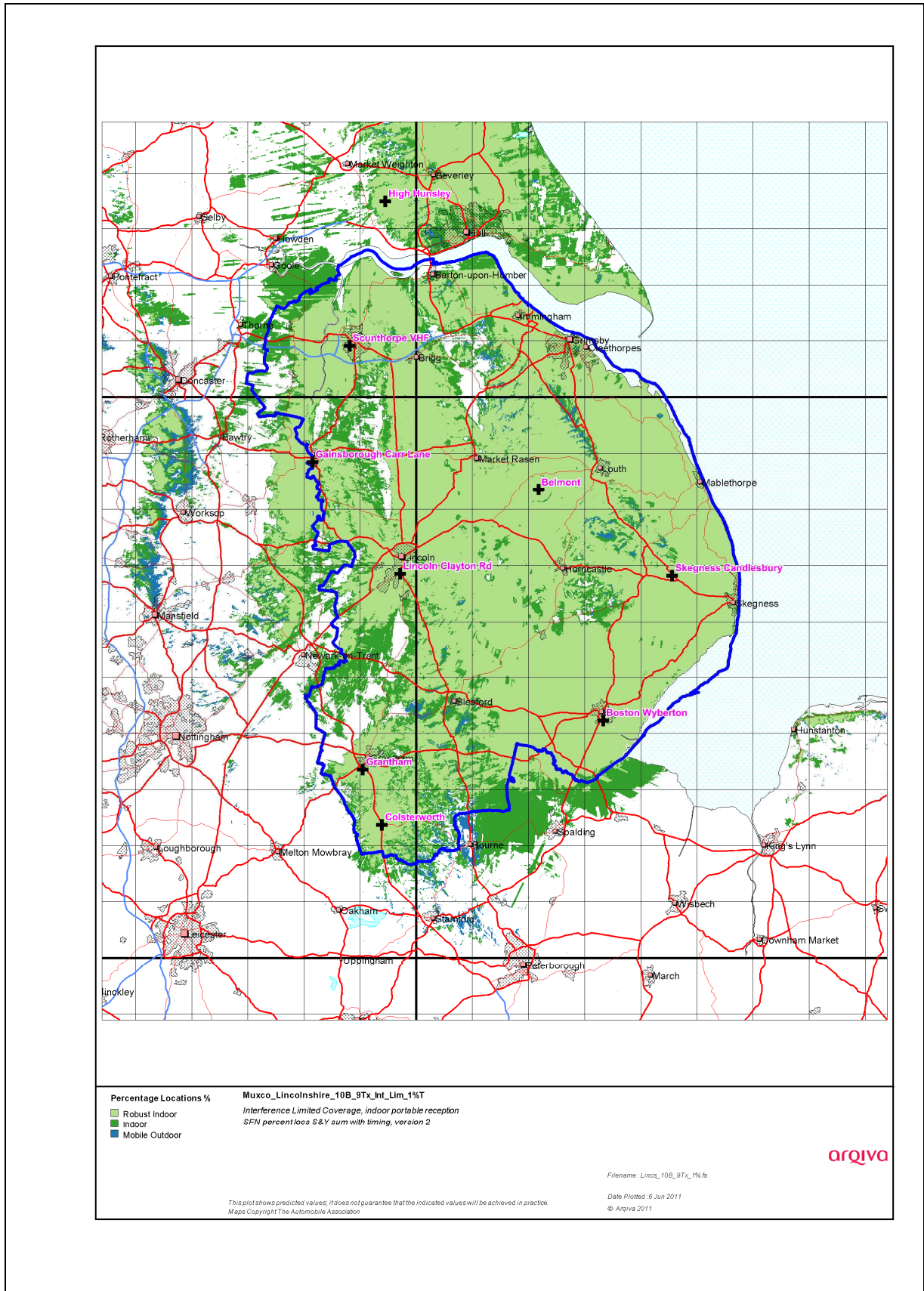


Figure 2-5. Modified Network 2 & 3

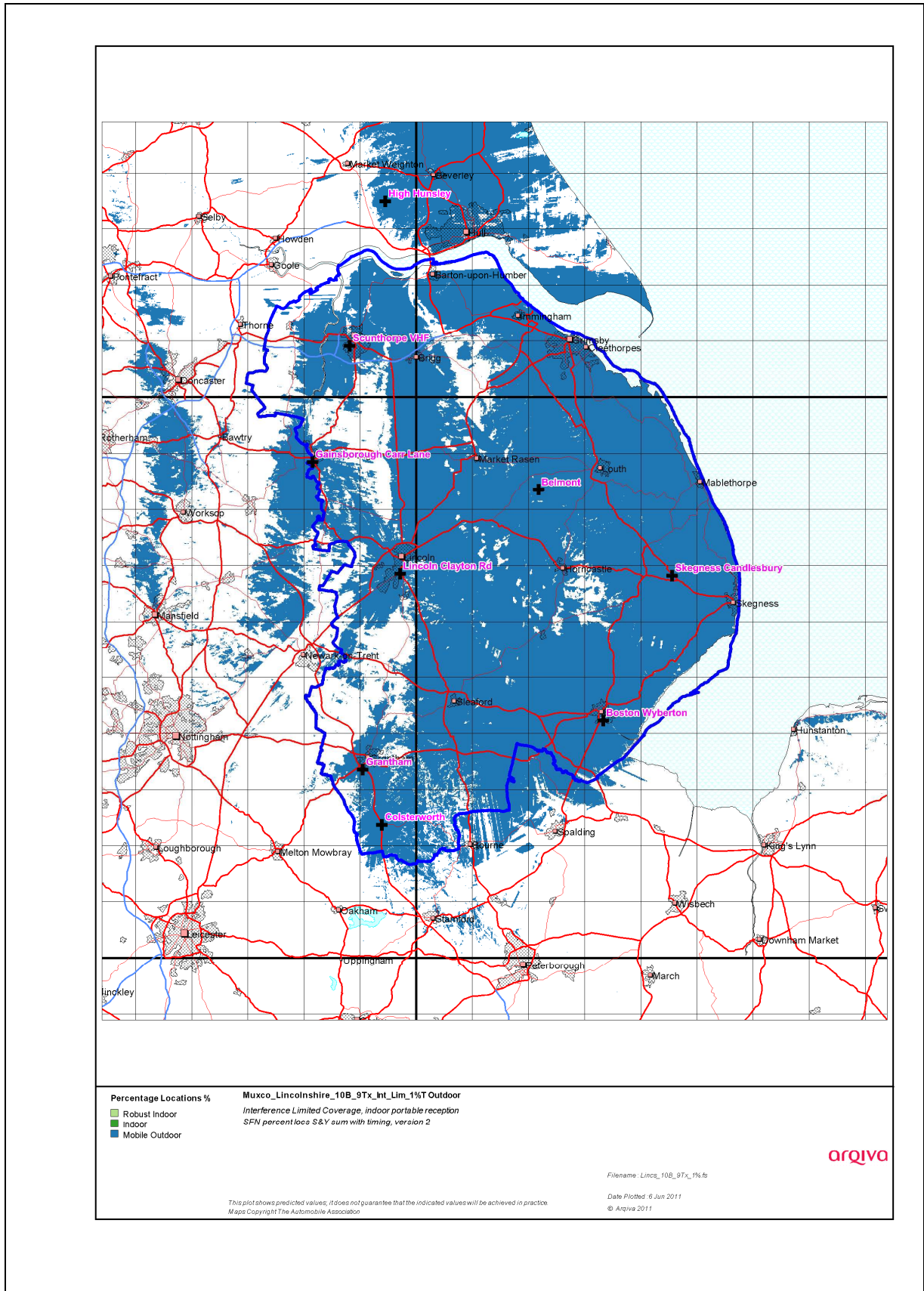


Figure 2-6. Modified Network 2 & 3 - 1% time Interference (Outdoor Only)

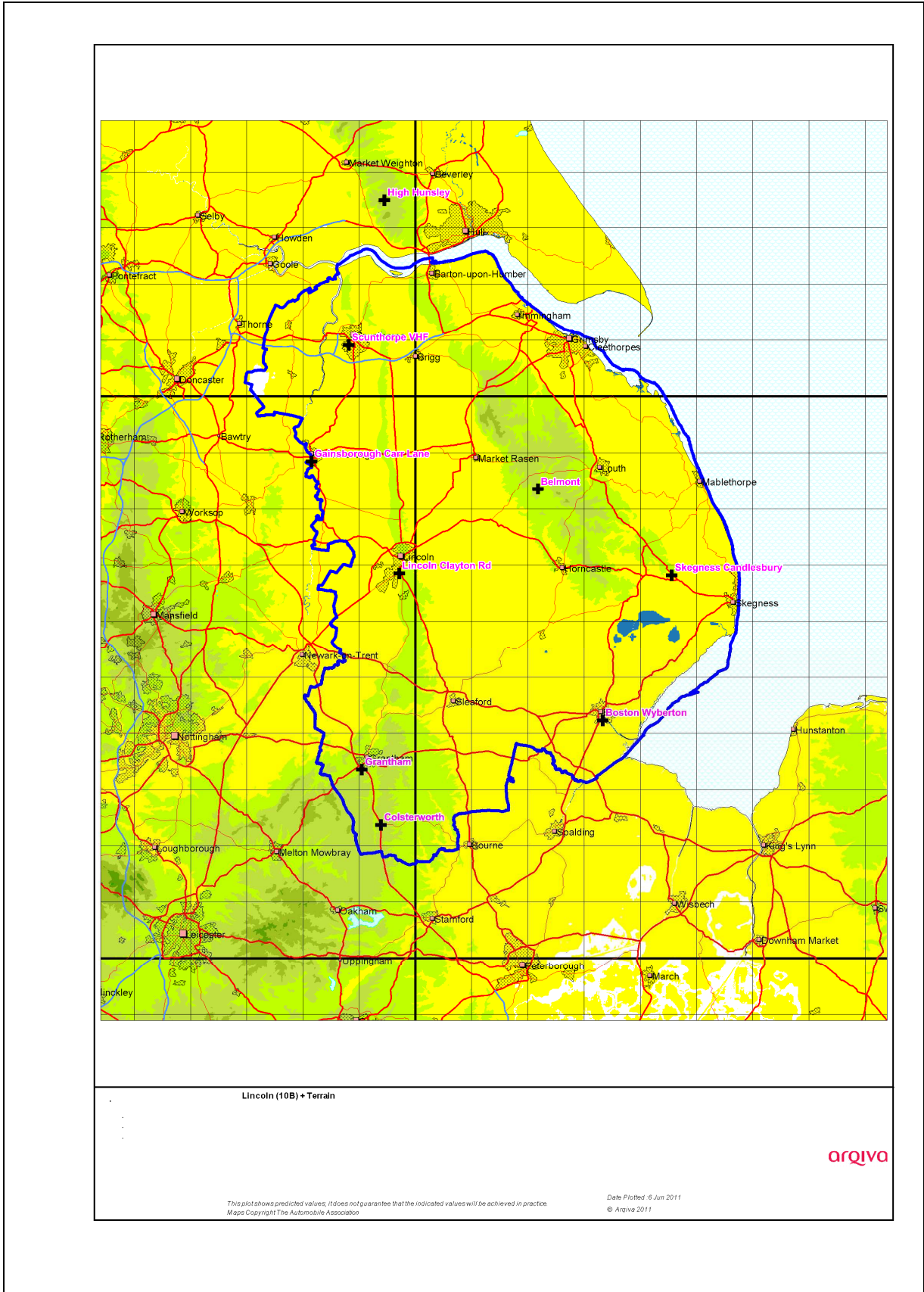


Figure 2-7. Lincoln Editorial Area + Terrain)

2.2 Population Coverage tables within Editorial Area

Table 2-1. Population coverage proportional indoor 1% time interference

: Total 400,033 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
Belmont	Shared Existing Infrastructure	177,819 (44.45%)	177,819	-	-	44.45%
Scunthorpe VHF	New	42,046 (10.51%)	225,495	47,676	11.92%	56.37%
Lincoln Clayton Rd	New	56,605 (14.15%)	278,466	52,971	13.24%	69.61%
Grantham	New Site	20,987 (5.25%)	306,627	28,161	7.04%	76.65%
Boston Wyberton	New Site	26,309 (6.58%)	334,568	27,941	6.99%	83.64%
Skegness Candlesbury	New site	22,325 (5.58%)	347,926	13,358	3.33%	86.97%
Gainsborough Carr Lane	New site	10,391 (2.60%)	357,473	9,547	2.39%	89.36%
High Hunsley	Shared Existing Infrastructure	6,235 (1.56%)	368,677	11,204	2.80%	92.16%
Colsterworth	New site	2,531 (0.63%)	374,530	5,853	1.46%	93.62%

Case 1	-	Yellow =	Planned coverage (with current 10B allocations): Not applicable
Case 2	-	Purple =	Modified Network 1 (planned transmitter with full 10B allocations)
Case 3	-	Orange =	Modified Network 2
Case 4	-	Green =	Modified Network 3 As Case 3

Table 2-2. Road coverage 99% location 99% time interference:

Total roads 1,222.4 km

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
Belmont	Shared Existing Infrastructure	609.0	-	-	49.8%
Scunthorpe VHF	New	679.4	70.4	5.8%	55.6%
Lincoln Clayton Rd	New	748.2	68.8	5.6%	61.2%
Grantham	New Site	821.7	73.5	6.0%	67.2%
Boston Wyberton	New Site	901.2	79.5	6.5%	73.7%
Skegness Candlesbury	New site	951.9	50.7	4.2%	77.9%
Gainsborough Carr Lane	New site	966.5	14.6	1.2%	79.1%
High Hunsley	Shared Existing Infrastructure	988.7	22.2	1.8%	80.9%
Colsterworth	New site	1,016.9	28.2	2.3%	83.2%

Case 1	-	Yellow =	Planned coverage (with current 10B allocations): Not applicable
Case 2	-	Purple =	Modified Network 1 (planned transmitter with full 10B allocations)
Case 3	-	Orange =	Modified Network 2
Case 4	-	Green =	Modified Network 3 As Case 3

Table 2-3. Summary of coverage within editorial area for each case 99% time

Case	Indoor (households)	Indoor (percentage of Editorial Area)	Mobile (in km within Editorial Area)	Mobile (percentage of roads within Editorial Area)
1	287,235	71.80%	971.6	79.48%
2	250,320	62.58%	715.7	58.55%
3	374,530	93.62%	1,1016.9	83.2%
4	374,530	93.62%	1,1016.9	83.2%

Case 1	-	Yellow =	Planned coverage (with current 10B allocations): Not applicable
Case 2	-	Purple =	Modified Network 1 (planned transmitter with full 10B allocations)
Case 3	-	Orange =	Modified Network 2
Case 4	-	Green =	Modified Network 3 As Case 3