Digital Switchover (DSO) Programme

Radio DSO Block 12D Leeds

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1.0	13/04/11	Draft version for review.
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Table of Contents

1 Leeds (12D) DSO Narrative

Block 12D assigned to Leeds is an existing allocation with three existing 'on-air' transmitters' :-

Transmitter	ERP (kW)
Morley	1.0
Beecroft Hill	1.0
Hunterstone	1.1

There are nine proposed Block 12D allocations throughout UK :-

N. Ireland

Edinburgh

Stoke-on-Trent

West & Mid Wales

Coventry

Reading & Basingstoke

Southend & Chelmsford

Peterborough

Leeds

All these multiplexes, above, are currently radiating on block 12D. In addition, West Wilts(12D) is also currently radiating, but the area covered by this multiplex is to be re-allocated to another block.

Fig 1.1 shows these proposed multiplexes in the area surrounding Leeds (12D). This also illustrates the terrain in the editorial area in relation to the other co-block allocations.

Multiplexes which have an affect upon, or are affected by, Leeds (12D), are Stoke (12D), Peterborough (12D). Reading & Basingstoke (12D), N. Ireland (12D), West & Mid Wales (12D) and Edinburgh (12D) and Southend & Chelmsford (12D), have little or no affect upon Stoke-on-Trent (12D). Similarly, Leeds (12D) has little or no affect upon these distant multiplexes.

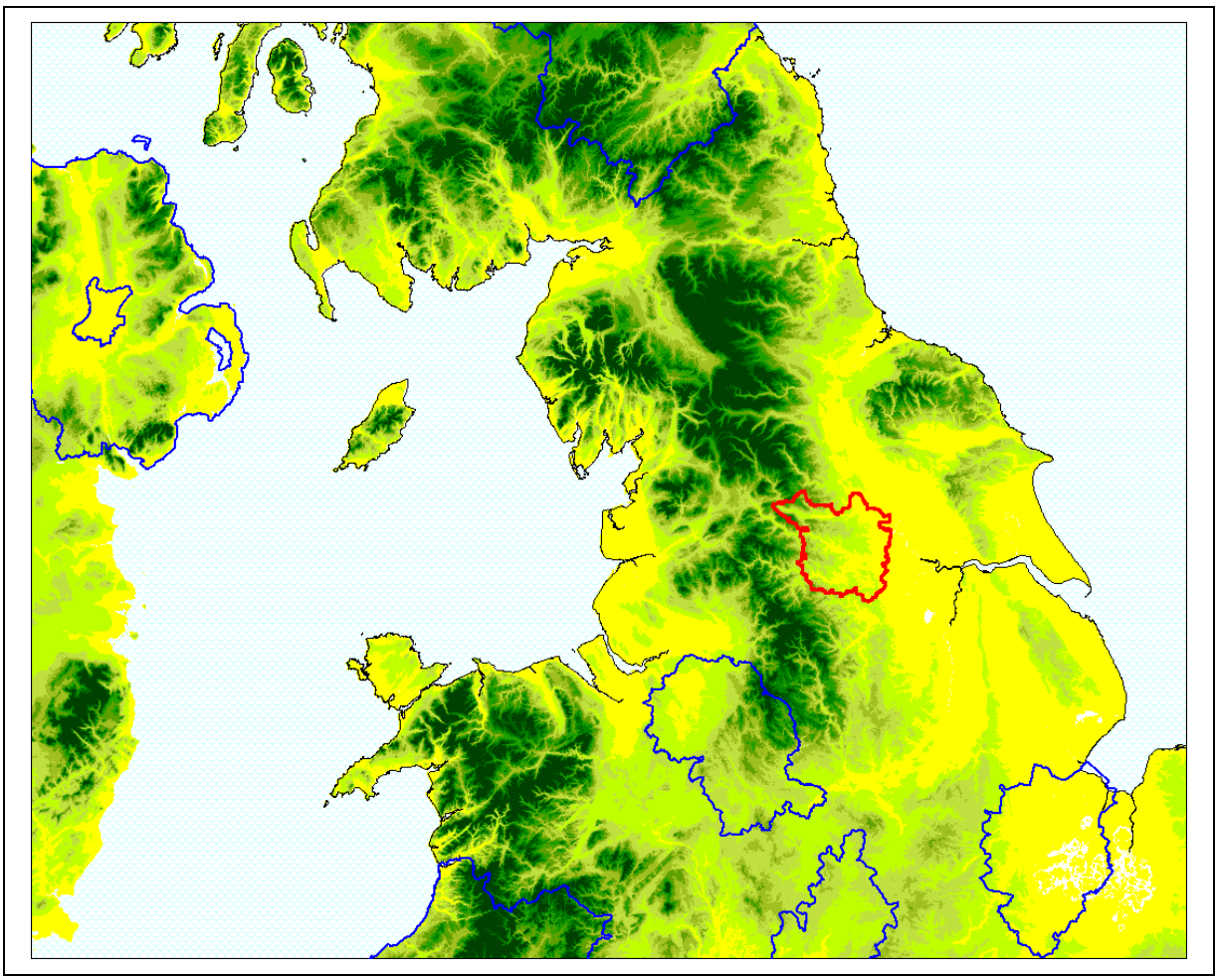


Figure 1.1: Proposed Block 12D Allocations

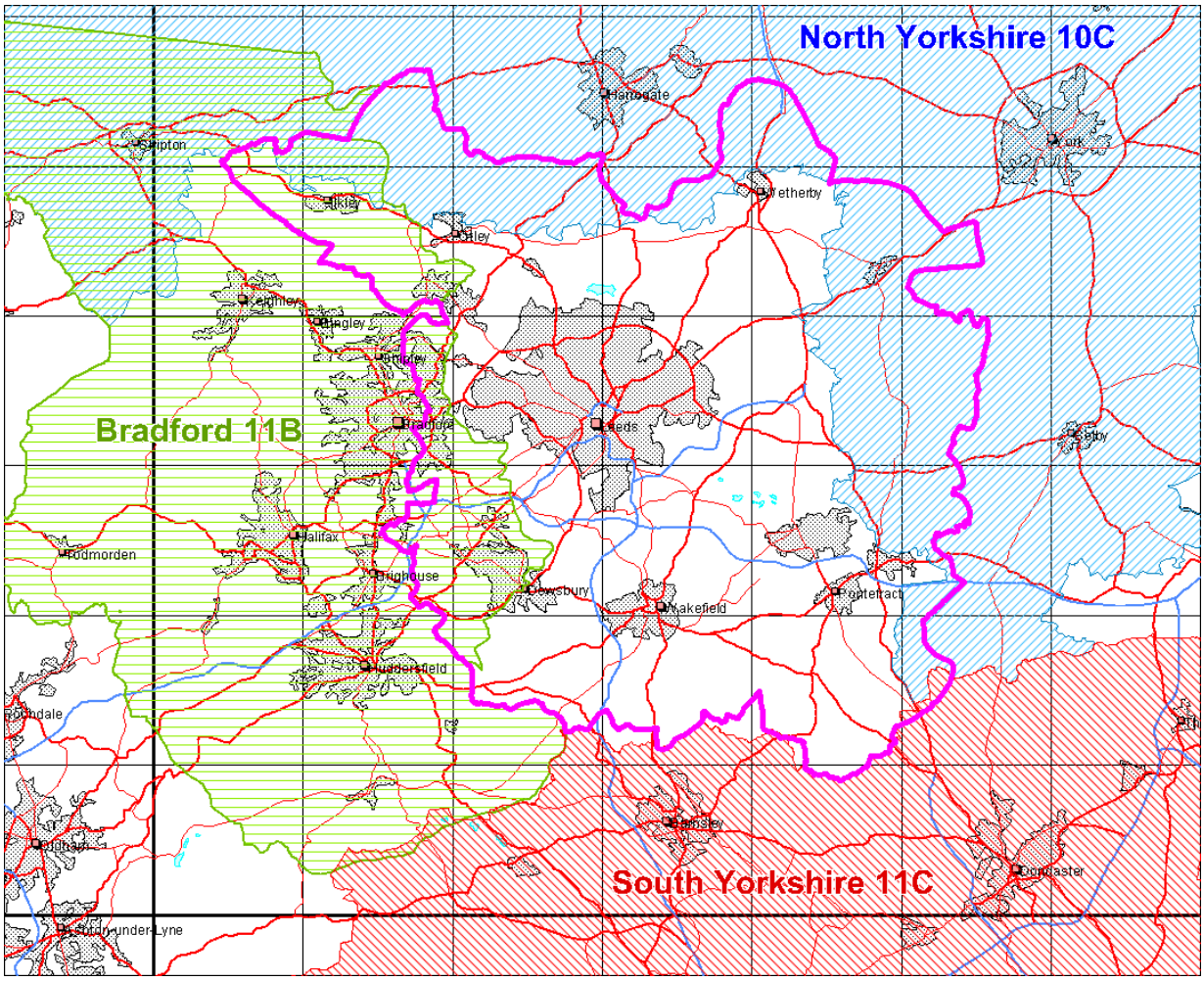
There is a substantial editorial area overlap with *Bradford, Halifax & Huddersfield (11B) and North Yorkshire (10C)*. These are shown on map, Figure 1.2 overleaf :-

In addition there is a further abutting allocation where overspill is possible :-

South Yorkshire (11C)

FM Radio coverage is currently provided by BBC Leeds (from *Beecroft Hill, Wharfedale, Holme Moss, Keighley* and *Luddenden,* transmitters). Independent radio is provided by Aire FM (from *the single transmitter at Tingley*). The area is well served by these combined FM services except for the valley running between Ilkley and Weatherby (although these two towns themselves are moderately well served)

The proposed Editorial Area has not changed from that which already exists for Leeds (12D).



Map Copyright: The Automobile Association

Figure 1-2: Leeds (12D) Editorial Area showing Surrounding Multiplexes

In planning for each multiplex, Ofcom have required coverage assessments:

- For each area four sets of maps should be produced as follows:

    1. **Current Situation** - Map showing current actual coverage (or launch plans where a multiplex 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

Figures 2-1 and 2-2 show the current 'on-air' situation in Leeds (12D). There are thee transmitters on-air and these are listed at beginning of *Section 1.* The antenna horizontal radiation patterns (HRPs) are overlaid onto these maps. Outdoor interference limited coverage includes the nine co-block interferers including West Wilts (12D), although only N Ireland (12D), Edinburgh (12D), Stoke (12D), Peterborough (12D) and Coventry (12D) impact Leeds (12D), some barely perceptibly.

In the proposed plan, the West Wilts (12D) allocation will move to another block.

The Leeds area currently enjoys relatively good coverage with relatively low levels of co-block interference. The existing area coverage is limited by terrain rather than co-block interference; the interposing Pennine range affectively screens much of the interference from Stoke-on-Trent (12D), the closest co-block multiplex.

For case 2: Modified network 1

It is not proposed to increase the maximum effective radiated powers (ERP) or alter the horizontal radiation patterns (HRP) of any of the three transmitters currently radiating – coverage is generally terrain limited in this area, increases in ERP will generally have a very limited affect other than illuminating generally unpopulated hilltops. *Figures 2-3 & 2-4 show the predicted coverage's.*

For case 3: Modified Network 2

In this it was required to serve areas where there is existing local FM coverage The area is well served by combined FM services except for the valley running between Ilkley and Weatherby (although these two towns themselves are moderately well served)

Only two further sites are required to emulate the FM coverage, Emley Moor and Thorp Arch coverage still does not match exactly that of the FM coverage. *Figures 2-5 and 2-6* shows these coverage's.

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).

The plan remains unchanged from that for Case 3 (previous page) Further transmitters may be added but with 5 transmitters, achieved coverage is >95% for Indoor and Roads.

Wharfedale (existing DAB infrastructure) site would improve coverage to *Ilkley & Otley* although the existing (on-air) site of Hunterstone provides reasonable coverage to these two villages; in addition, it provides better contiguous coverage to the north into the North Yorkshire (10C) multiplex.

1.1 Incoming interference and sensitivity to other co-block multiplexes

The general 'Benchmark' for indoor and outdoor co-block interference protection is for 99% time and predicted coverage held up well to these levels so further predictions for 95% time interference were not necessary.

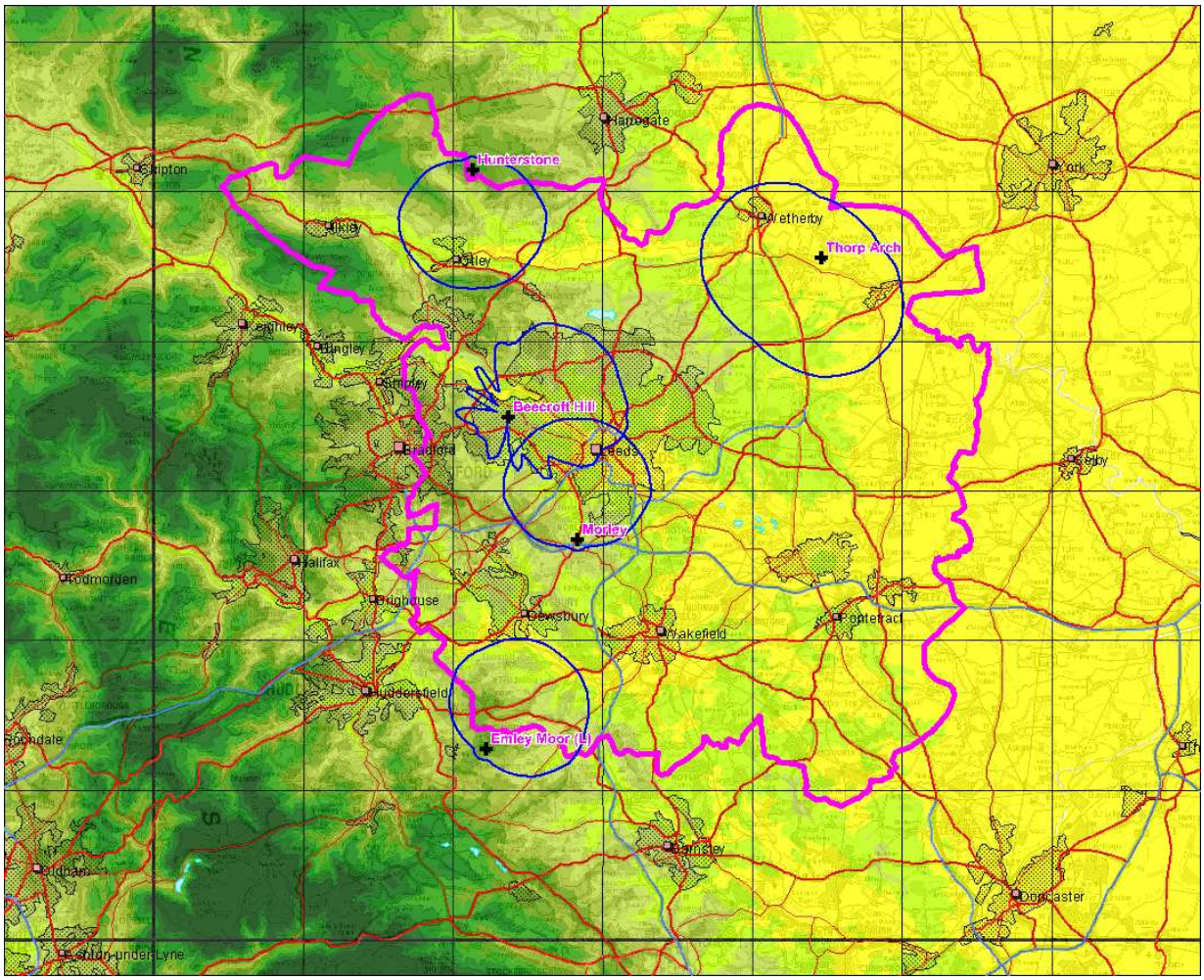
With five transmitters, indoor coverage was predicted to be 96.58% of the Editorial Area (1% Time interference). Outdoor (Road) coverage is 97.73% (1% Time interference).

The most significant interfering co-block multiplex is Peterborough (12D) - transmitters of *Peterborough (on-air) and Fulney VHF (proposal)* being the most significant

N Ireland (12D), Edinburgh (12D) and Stoke-on-Trent (12D) have a slight, impact.

1.2 Outgoing interference to other co-block multiplexes

There is a slight impact to other co-block allocations from the proposals contained in this report; principally to the coverage of Peterborough (12D), primarily from the transmitter of *Emley Moor* (proposal); and to Stoke-on-Trent (12D), slightly impacted, primarily from *Hunterstone* (on-air).



Map Copyright: Ordnance Survey 1: 625,000

Figure 1-3 Leeds (12D) Editorial Area – with Terrain

Solid Purple Contour Editorial Area

Antenna Horizontal Radiation Patterns (HRP) are shown for the 5 transmitters proposed (Case 3/4)

2 Coverage of the Multiplex

2.1 Coverage Maps

Coverage maps for the DAB are generally presented with three colours unless otherwise stated:

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)

Figure 2-1 Existing Situation
Figure 2-2 Existing Situation – Outdoor Only: 1% Time Interference
Figure 2-3 Modified Network 1
Figure 2-4 Modified Network 1 – Outdoor Only: 1% Time Interference
Figure 2-5 Modified Network 2
Figure 2-6 Modified Network 2 – Outdoor Only: 1% Time Interference

Note *Modified Network 3 remains unchanged from Modified Network 2*

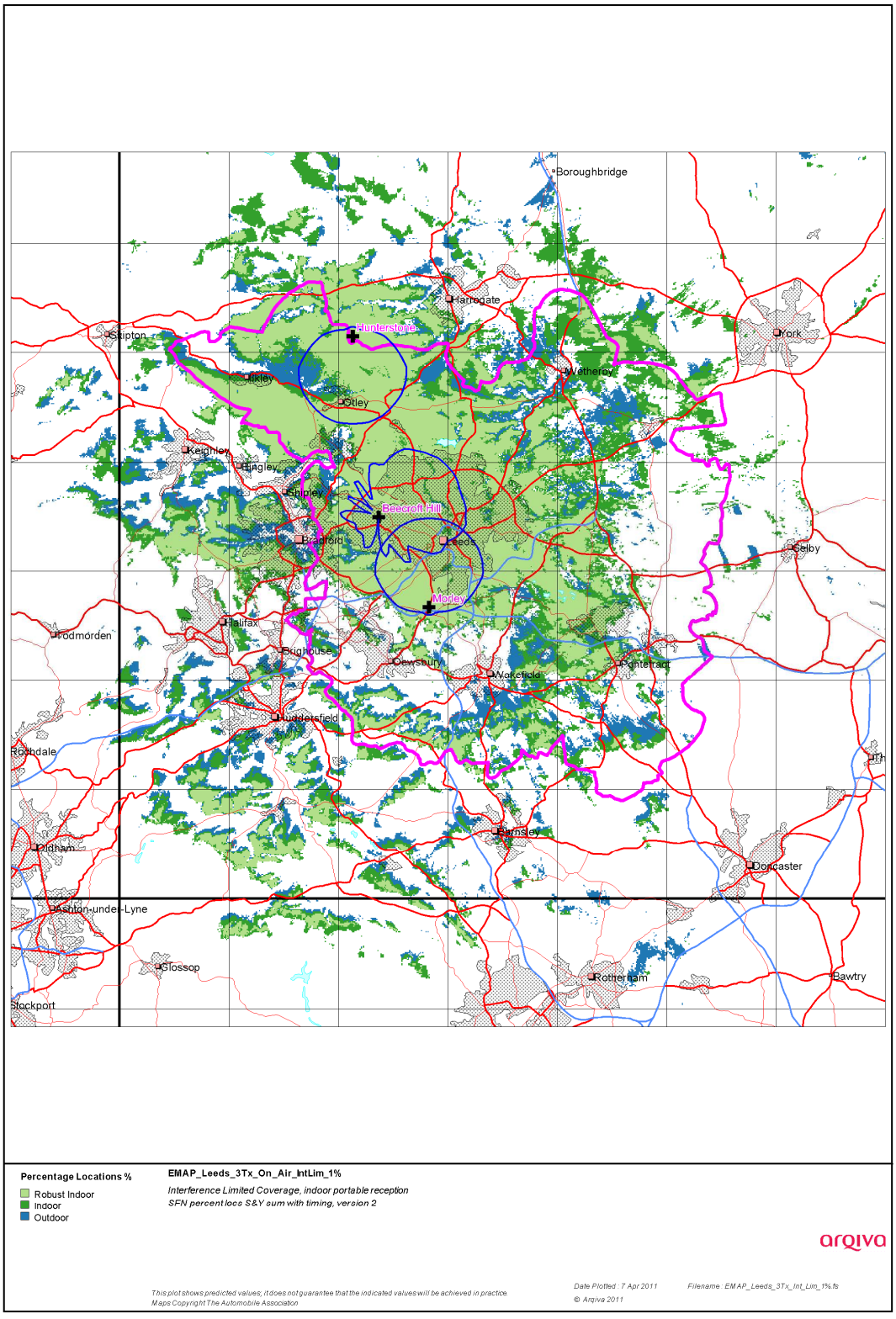


Figure 2-1. Current Situation

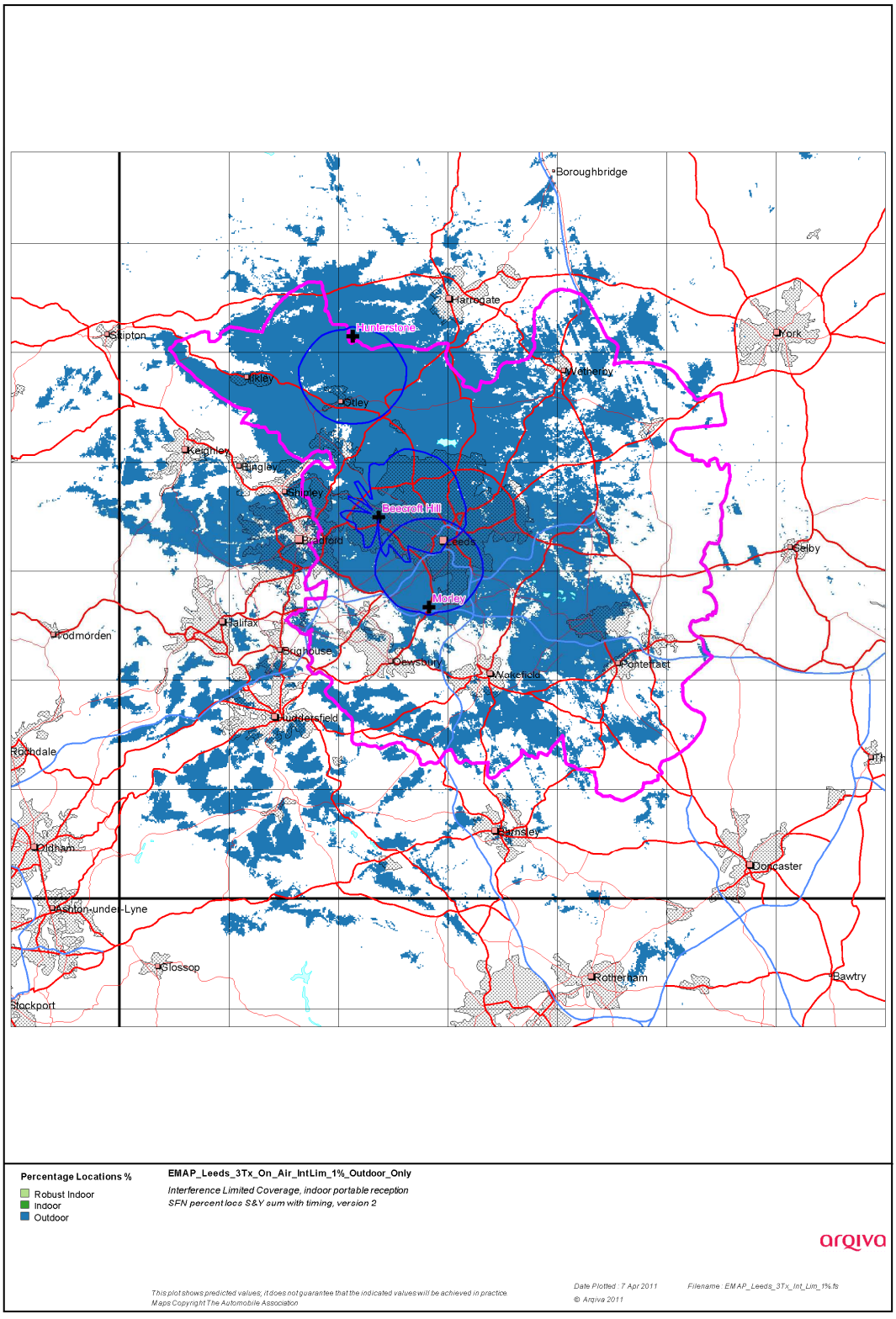


Figure 2-2. Current Situation – Outdoor Only, 1% Time Interference

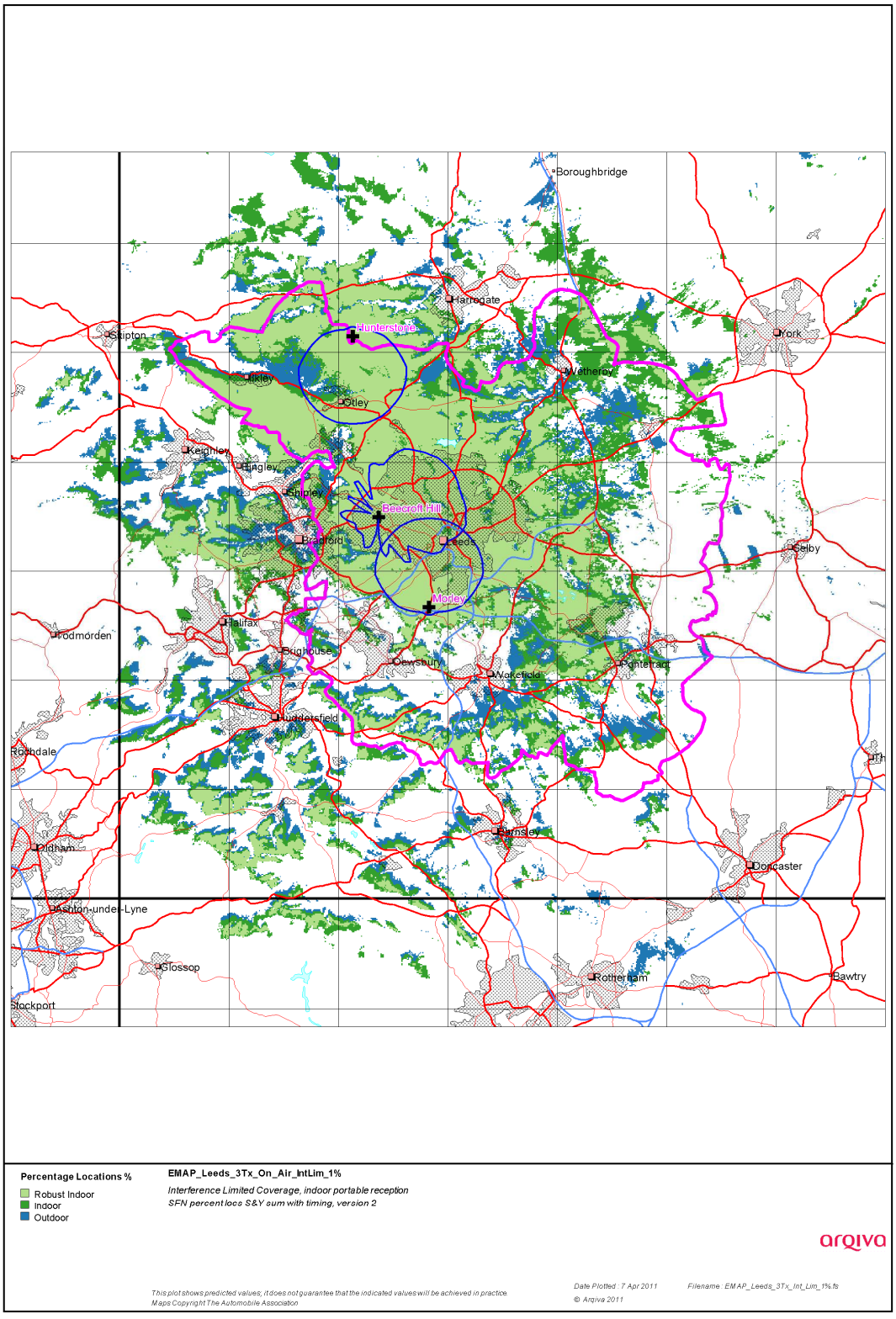


Figure 2-3. Modified Network 1

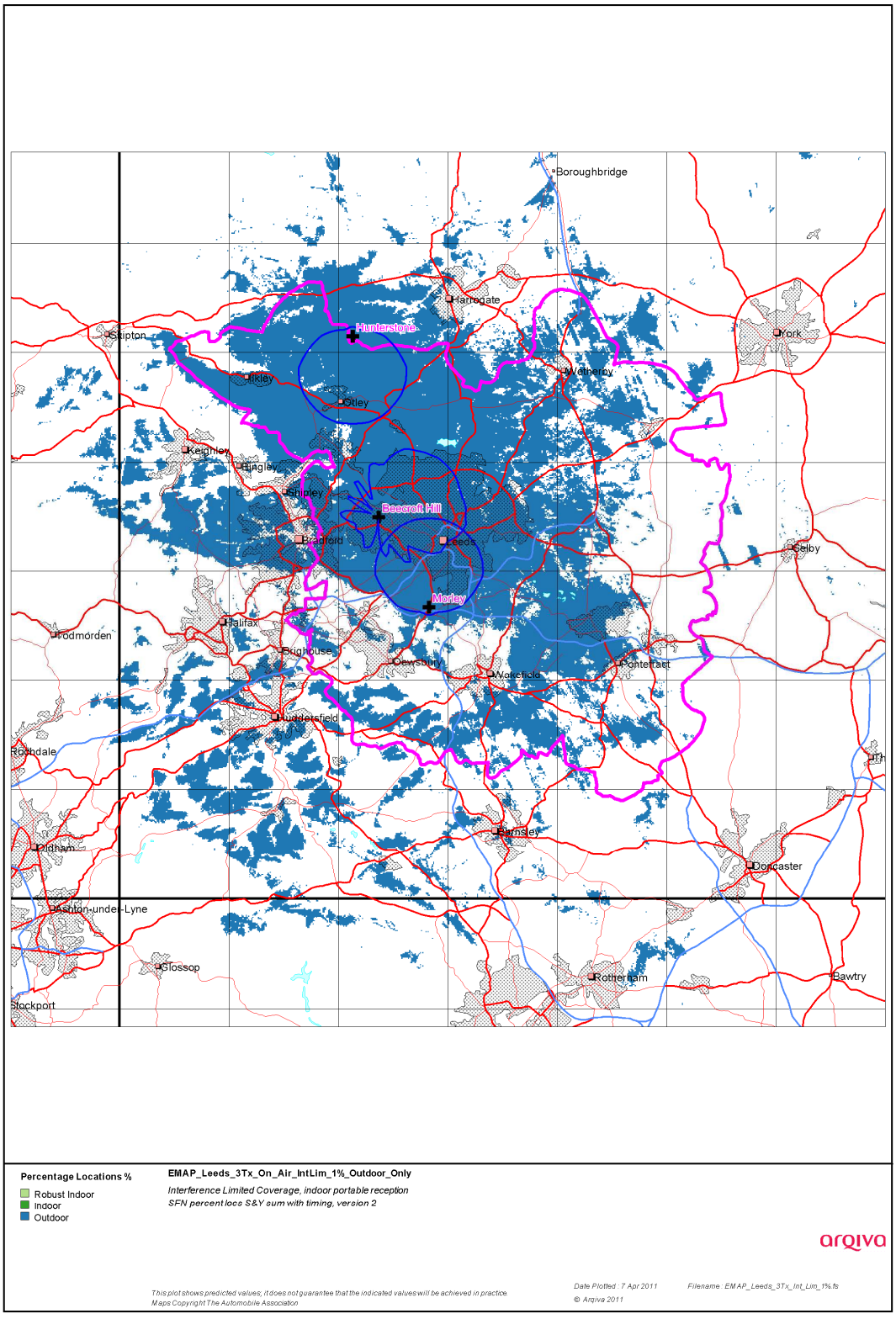


Figure 2-4. Modified Network 1 – Outdoor Only, 1% Time Interference

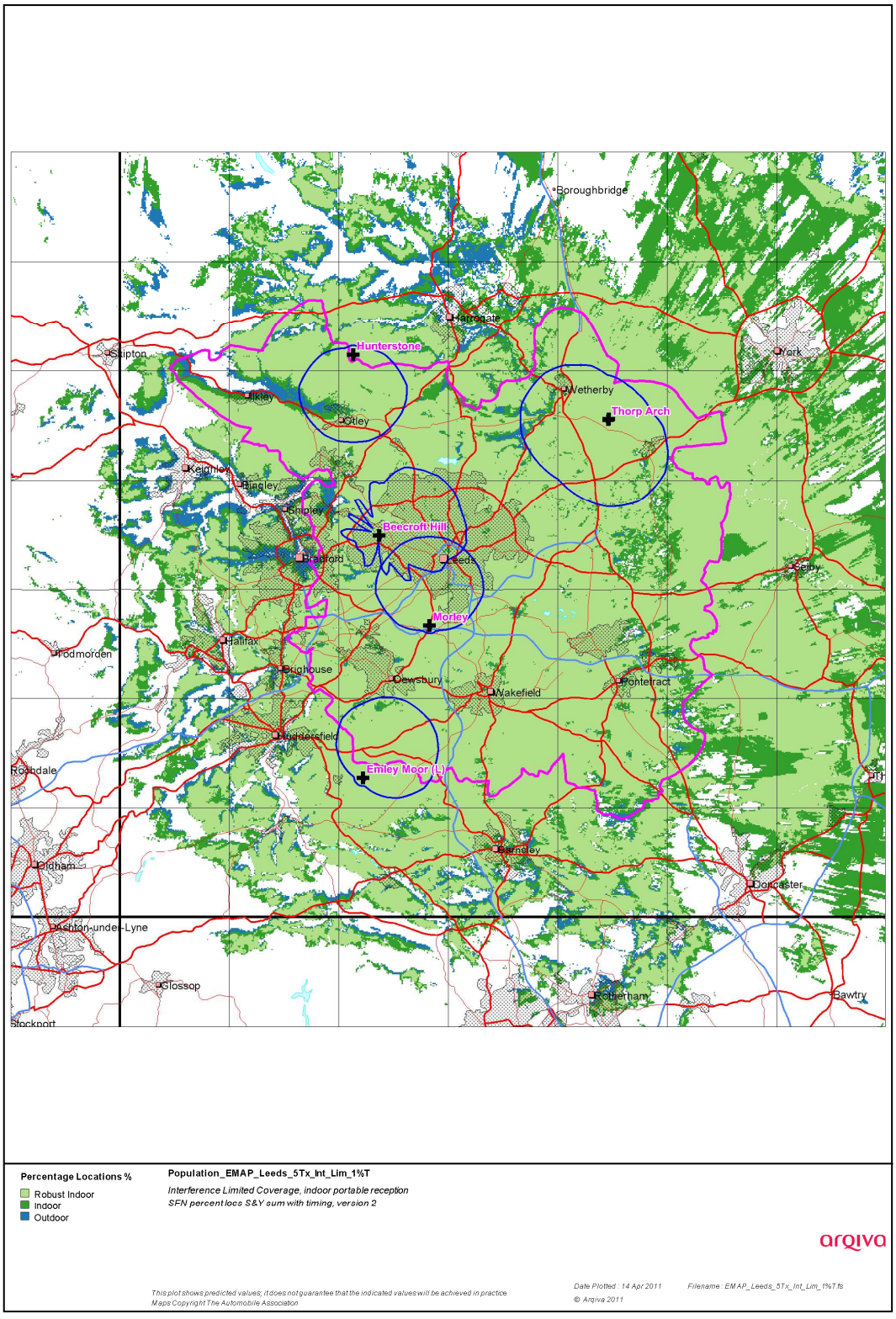


Figure 2-5. Modified Network 2

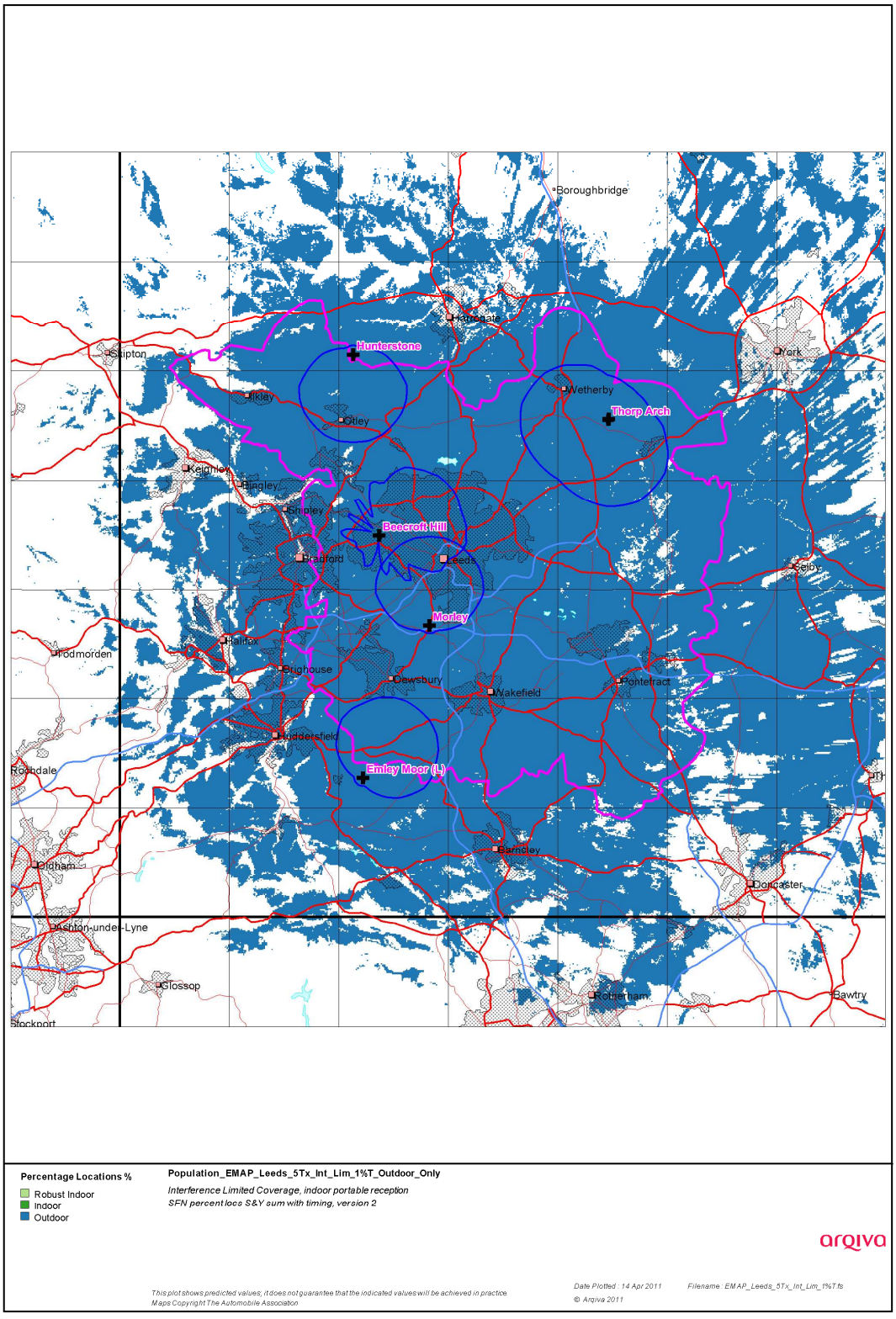


Figure 2-6. Modified Network 2 – Outdoor Only, 1% Time Interference

2.2 Population Coverage tables within Editorial Area

Table 2-1 Population - Proportional Indoor Coverage: Total households 618,773

Site Scenario and Incremental Additional Sites	Site Type	Individual Gross Interference Limited Coverage within Editorial Area	Number of Households within Editorial Area	Increase in Number of Households	Incremental Percentage Increase of Population (%)	Percentage of Editorial Area (%)
Current (4Tx)	Existing	-	388,697	-	-	62.82
Current (4Tx)	Existing	-	378,560	-10,137	-6.03	56.79
Emley Moor (L)	New, Existing Infrastructure	465,746 (75.27%)	589,494	210,934	38.48	95.27
Thorp Arch	New	9,778 (1.58%)	597,637	8,143	1.31	96.58

Case 1		Light yellow	Existing Network
Case 2	-	Purple	Modified Network 1
Case 3	-	Blue	Modified Network 2
Case 4	-	Blue + Green	Modified Network 3 n/a - (same as Case 3

Table 2-2. Road Coverage 99% Locations and 99% Time Interference Protection

Total Roads 785.3 km

Site Scenario and Incremental Additional Sites	Site Type	Total Road Length (km)	Increase in Road Length (km)	Incremental Percentage of Road Length (%)	Percentage of Roads within Editorial Area (%)
Current (4Tx)	Existing	623.4	-	-	62.16
Current (4Tx)	Existing	539.0	-84.4	-5.37	56.79
Emley Moor (L)	New, Existing Infrastructure	753.6	214.6	39.21	96.0
Thorp Arch	New	767.5	13.9	1.7	97.7

Case 1		Light yellow	Existing Network	
Case 2	-	Purple	Modified Network 1	
Case 3	-	Blue	Modified Network 2	
Case 4	-	Blue + Green	Modified Network 3	n/a – same as Case 3

Table 2-3. Summary of Coverage within Editorial Area for each case

Case	Indoor Households & (percentage coverage) *Proportional & 99% Time Interference Protection*	Mobile Coverage km & (percentage coverage) *99% Locations & 99% Time Interference Protection*
1	388,697 (62.82%)	623.4 (62.16%)
2	378,560 (56.79%)	539.0 (56.79%)
3	597,637 (96.58%)	767.5 (97.7%)
4	597,637 (96.58%)	767.5 (97.7%)

Case 1		Light yellow	Existing Network	
Case 2	-	Purple	Modified Network 1	
Case 3	-	Blue	Modified Network 2	
Case 4	-	Blue + Green	Modified Network 3	same as Case 3