Digital Switchover (DSO) Programme

Radio DSO Block 12D Stoke-on-Trent

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Author	Denis Ripley			
Verifier	Brian Tait			
Owner	Glenn Doel			
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1.0	08/04/11	Draft version for review.
1.0	18/04/11	Initial release
2.0	25/05/11	Editorial Area changes

Table of Contents

1 Stoke-on-Trent (12D) DSO Narrative

Block 12D assigned to Stoke-on-Trent is an existing allocation with four existing transmitters 'On -Air' :-

Transmitter	ERP (kW)
Alsagers Bank	0.640
Pye Green BT	0.850
Sutton Common	0.500
Tick Hill	2.0

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

N. Ireland

Edinburgh

Leeds

West & Mid Wales

Coventry

Reading & Basingstoke

Southend & Chelmsford

Peterborough

Stoke-on-Trent

All these multiplexes, above, with the exception of West & Mid Wales, 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 Stoke-on-Trent (12D). This also gives an idea of the terrain in the editorial area in relation to the other co-block allocations.

Multiplexes which have an affect upon, or are affected by, Stoke-on-Trent (12D), are Coventry (12D), Leeds (12D) and 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, Stoke-on-Trent (12D) has little or no affect upon these distant multiplexes.

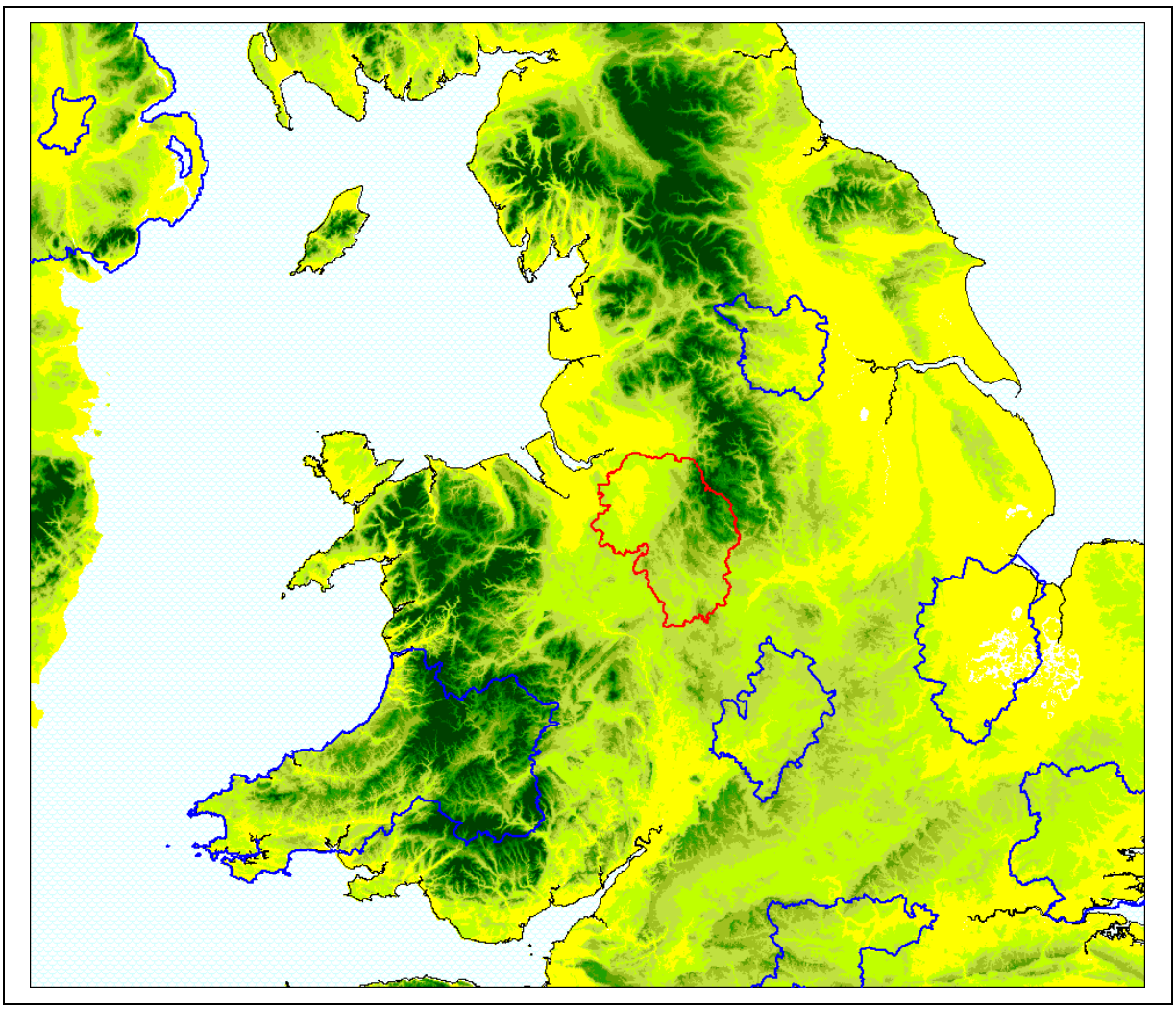
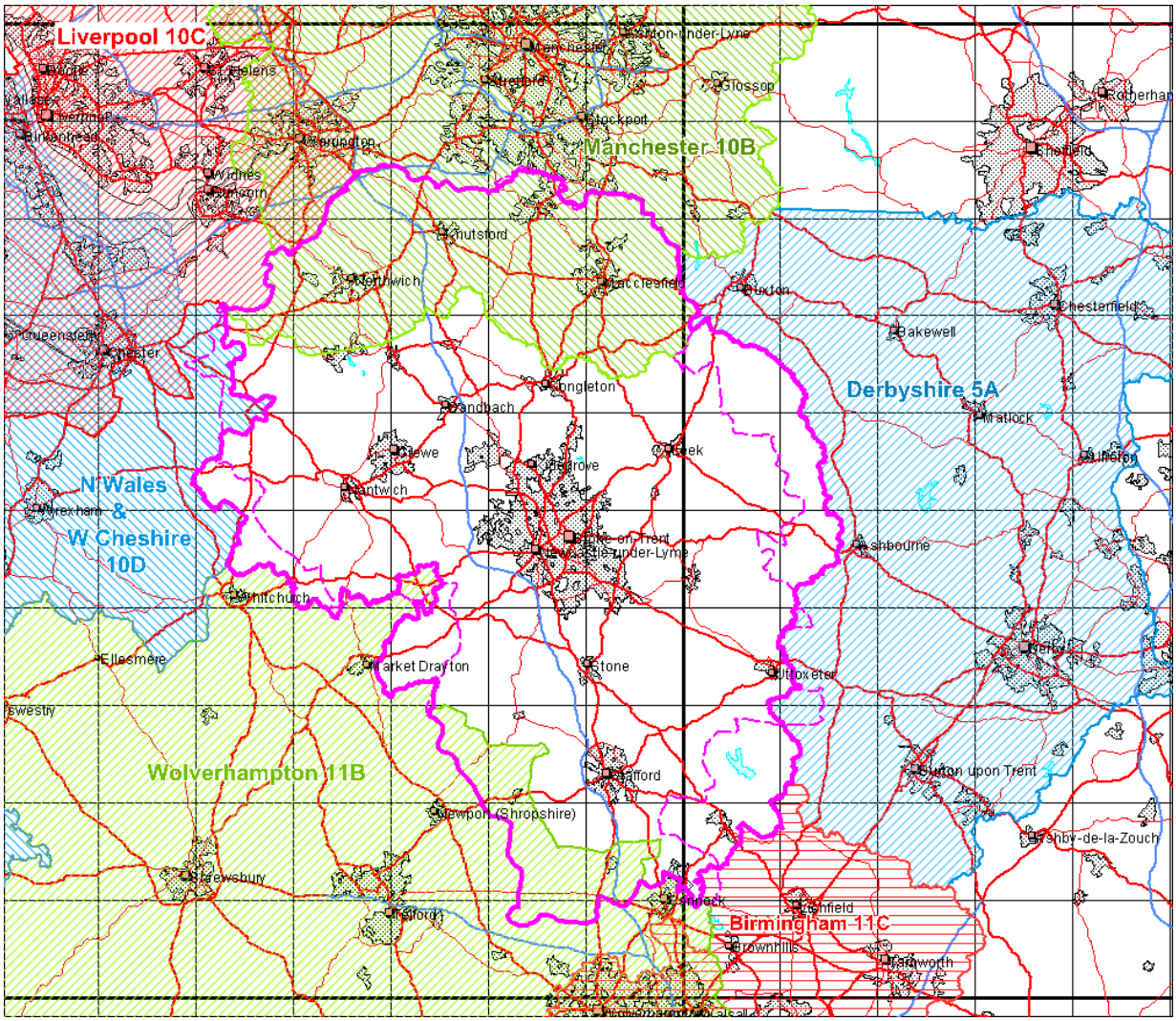


Figure 1.1: Proposed Block 12D Allocations

There is a substantial editorial area overlap with *Manchester (10B)*, and smaller overlap with *Wolverhampton (11B* These are shown on map, Figure 1.2 overleaf :-

FM Radio coverage is currently provided by BBC Stoke (from *Alsagers Bank* and *Stafford,* transmitters). Independent radio is provided by Signal One (from *Alsagers Bank, Sutton Common* and *Pye Green* transmitters). The area is served somewhat indifferently by these combined FM services in the east which were previously outside the original Editorial Area; these areas tend to coincide with the upland areas.

The proposed Editorial Area has changed significantly (see coverage map *Fig 1-2* for comparison); the solid purple contour represents the proposed Stoke-on-Trent (12D) editorial area, whereas the finer broken purple contour is that of the existing Stoke-on-Trent (12D) editorial area.



Map Copyright: The Automobile Association

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

(Existing Stoke-on-Trent (12D) Editorial Area shown with broken purple contour)

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 & 2-2 show the current 'on-air' situation in Stoke-on-Trent (12D). There are four transmitters on-air, listed at beginning of *Section 1.* The antenna horizontal radiation patterns (HRPs) are overlaid. Outdoor interference limited coverage includes the eight co-block interferers including West Wilts (12D); the proposed West & Mid Wales (12D) is not currently radiating. In the proposed plan, this West Wilts (12D) allocation will move to another block. This area currently enjoys relatively good coverage with relatively low levels of co-block interference. The exception being the upland areas on the edge of the Peak District, in the east of the editorial area; this was previously outside the original editorial area.

The area is rather well served by just four transmitters because there is very little incoming co-block interference

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 4 transmitters currently radiating. In places, especially in the east, the coverage is terrain limited so ERP increases could have a detrimental affect upon Coventry (12D) Coverage is drastically less than that which currently exists because of the increase in co-block interference in the fully implemented, post DSO environment; especially from Coventry (12D) – predominantly Ilmington, Meriden & Daventry transmitters - but also West & Mid Wales (12D) – Llandrindod Wells transmitter.

Figures 2-3 & 2-4 show the predicted coverages.

Coverage is vastly reduced from Case 1, above, because of the enormous proliferation of transmitter proposals for other 12D co-block areas.

For case 3: Modified Network 2

In this it was required to serve areas where there is existing local FM coverage the area is moderately served by FM, except in the hilly terrain in the east and south west. Burton-on-Trent in the south east was outside the original editorial area and is unserved by FM.

Three further sites are required to emulate the FM coverage, Mow Cop, Cheadle and Pirehill Farm; coverage still does not match exactly that of the FM coverage. *Figures 2-5 & 2-6* show the case 3 coverage.

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).

A further three transmitters have been added; Coxbank Farm, usefully serving Uttoxeter; the eponymous Leek transmitter, again providing useful coverage, and Hartington (somewhat less useful) serving the small rural area on the reverse slope on the edge of the Peak District. This latter transmitter proposal remains an island of coverage, remote from any other transmitters. Coverage is frustrated by the hilly terrain; many small transmitters would be required to serve these sparsely populated areas within the valleys in The Peak District National Park.

Proposals for the overlapping Manchester (10B) service, covers much of the areas not served the north. *Figures 2-7 & 2-8* show the case 4 coverage.

1.1 Incoming interference and sensitivity to other co-block multiplexes

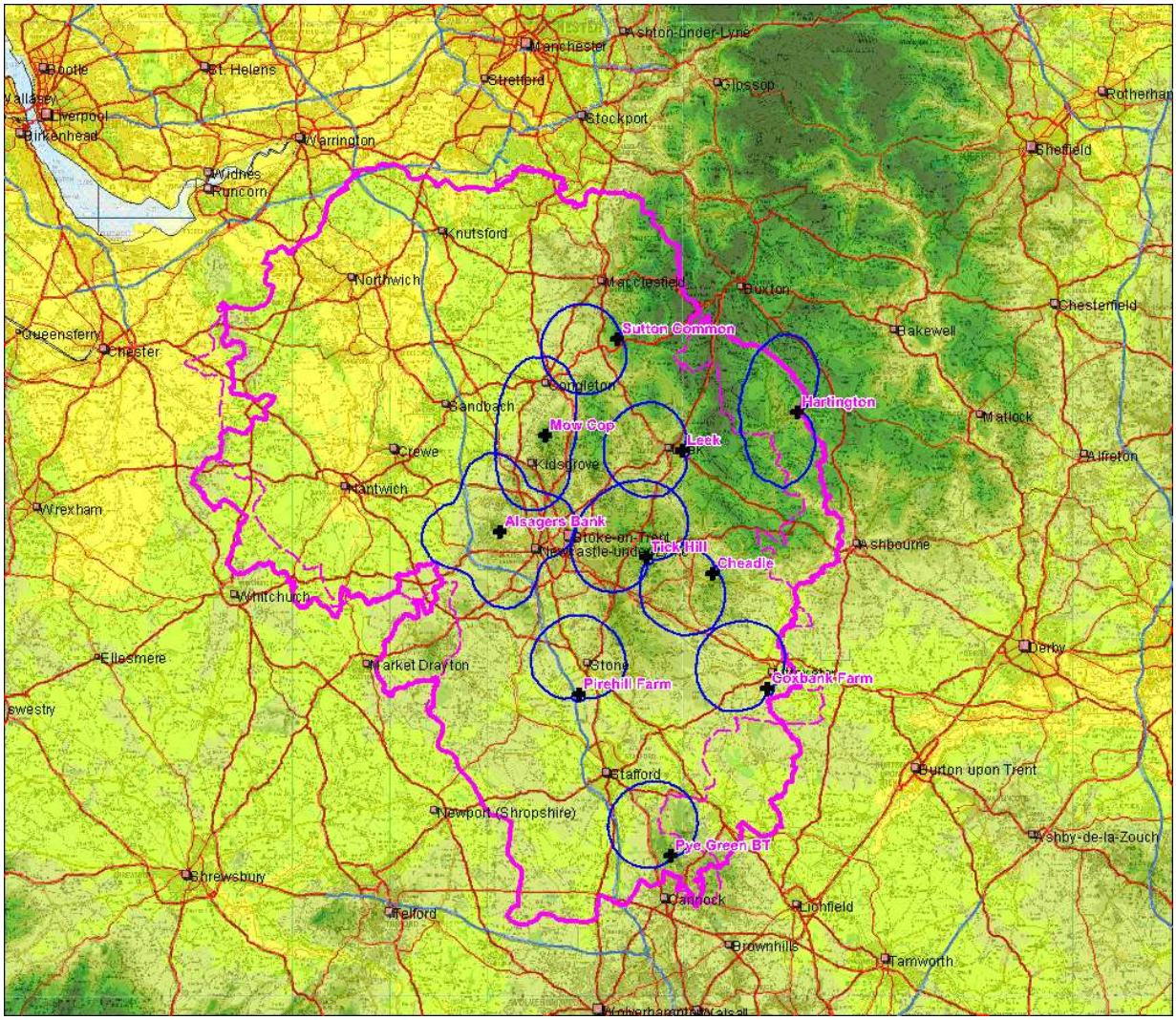
With 10 Transmitters, indoor coverage was predicted to be 81.78%% of the Editorial Area (1% Time interference) outdoor (road) coverage is 73.8% (1% time interference) and this improves to 82.7% (5% time interference).

The most significant interfering co-block multiplexes are Coventry (12D) - transmitters of *Ilmington (proposal), Daventry (proposal) and Meriden (on-air but modified proposal);* West & Mid Wales (12D) – transmitter *Llandrindod Wells* and Peterborough (12D*).*

N Ireland (12D), Southend & Chelmsford (12D) and Edinburgh (12D) have no, or only slight, impact.

1.2 Outgoing interference to other co-block multiplexes

There is an impact to other co-block allocations from the proposals contained in this report, principally to the coverage of Coventry (12D), primarily from transmitters of *Mow Cop (proposed), Alsagers Bank (on-air)* and *Sutton Common (on-air)*. Peterborough (12D) is impacted primarily from *Tick Hill* (on-air).



Map Copyright: Ordnance Survey 1: 625,000

Figure 1-3 Soke-on-Trent (12D) Editorial Area – with Terrain

Broken Purple Contour	Original (existing) Editorial Area
Solid Purple Contour	Proposed Editorial Area

Antenna Horizontal Radiation Patterns (HRP) are shown for the 10 transmitters proposed (Case 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)

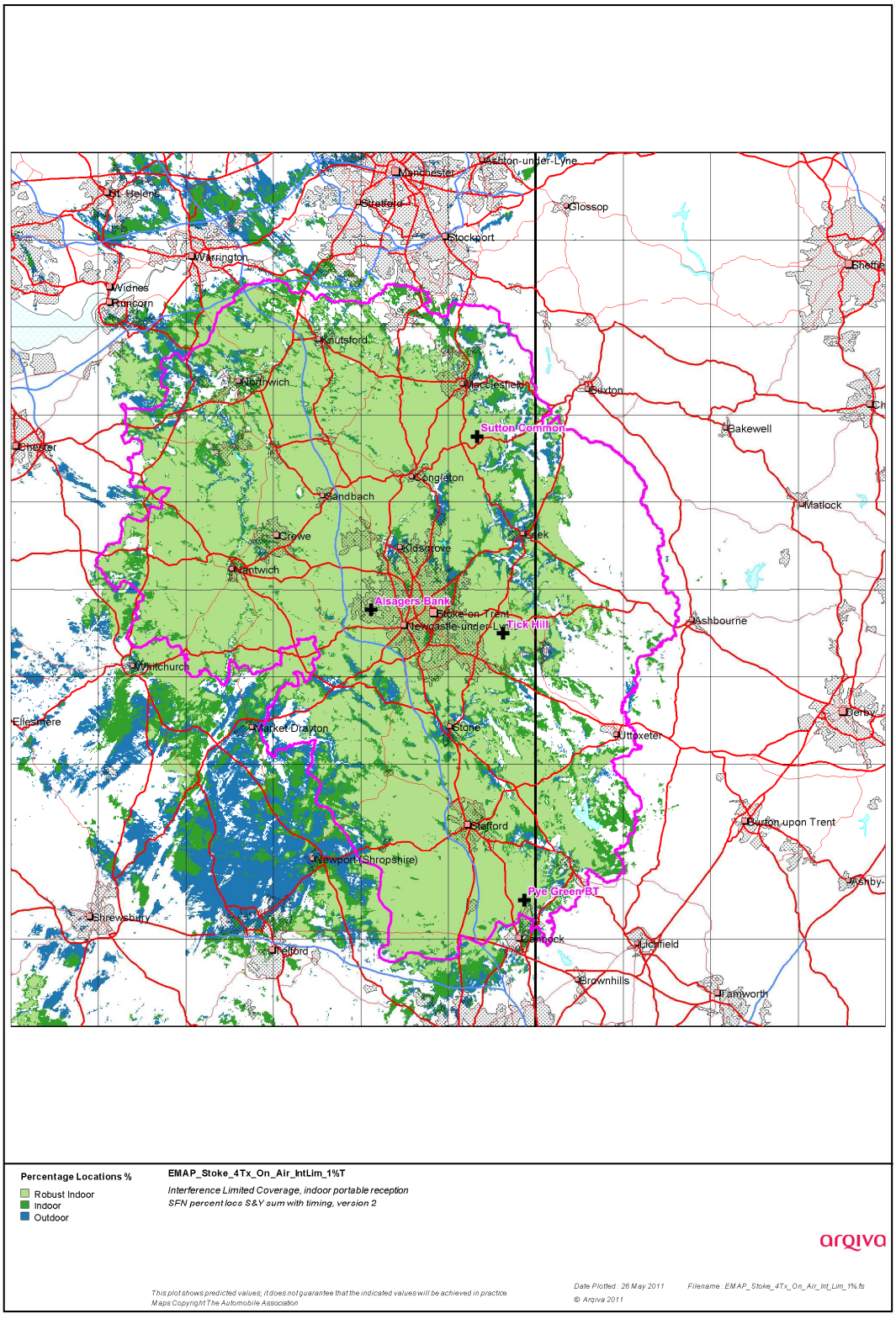


Figure 2-1. Current Situation

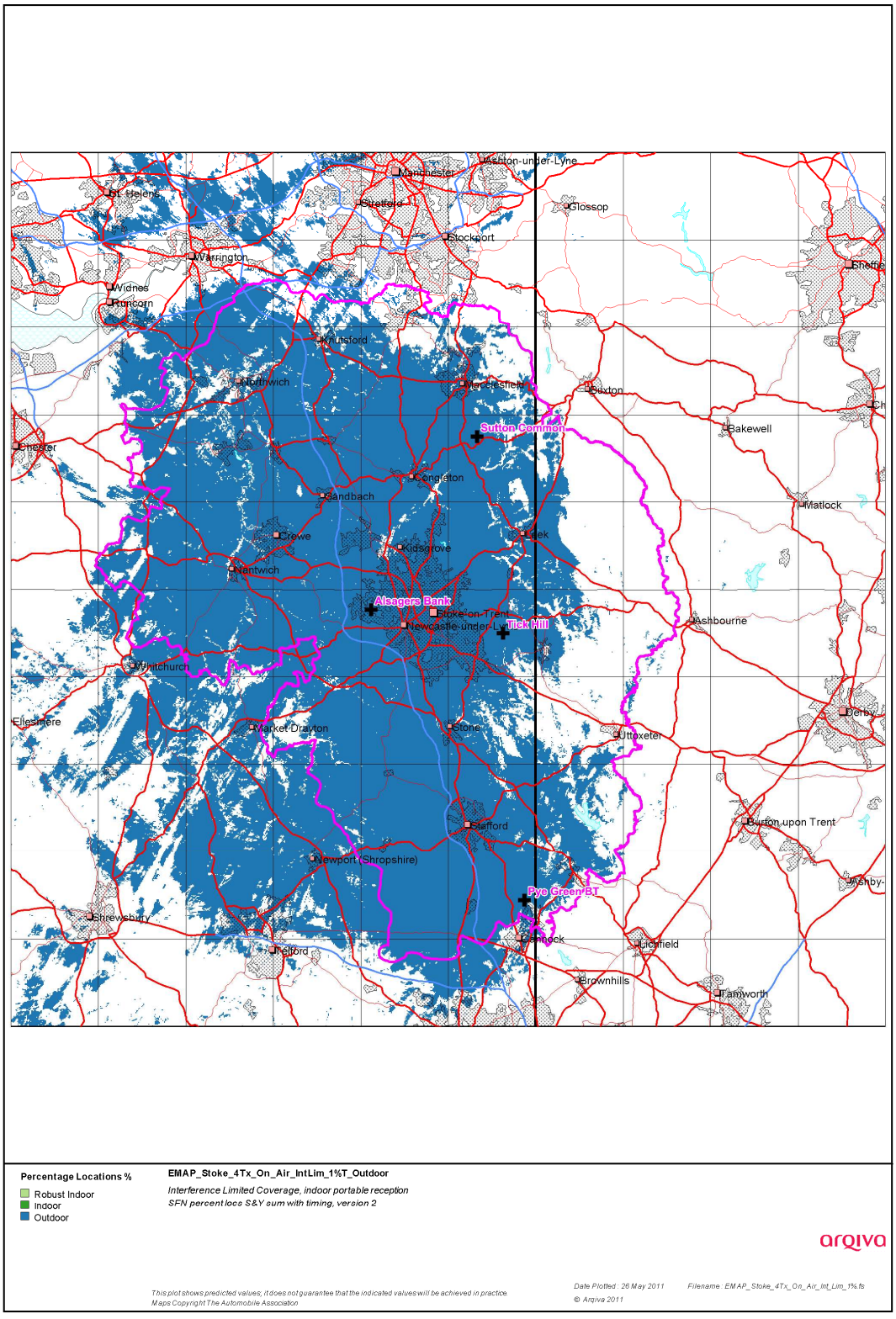


Figure 2-2. Current Situation – Outdoor Only, 1% Time Interference

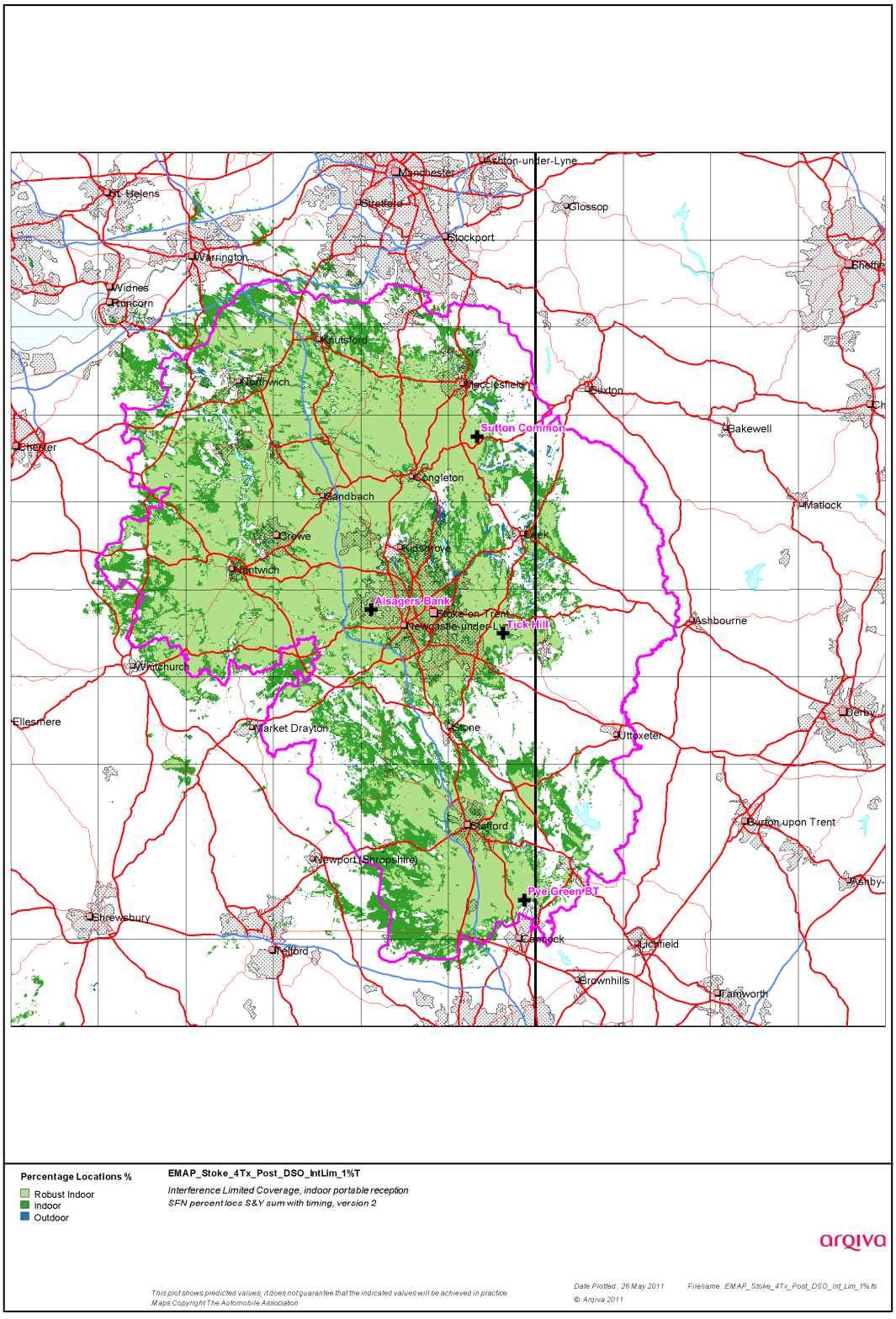


Figure 2-3. Modified Network 1

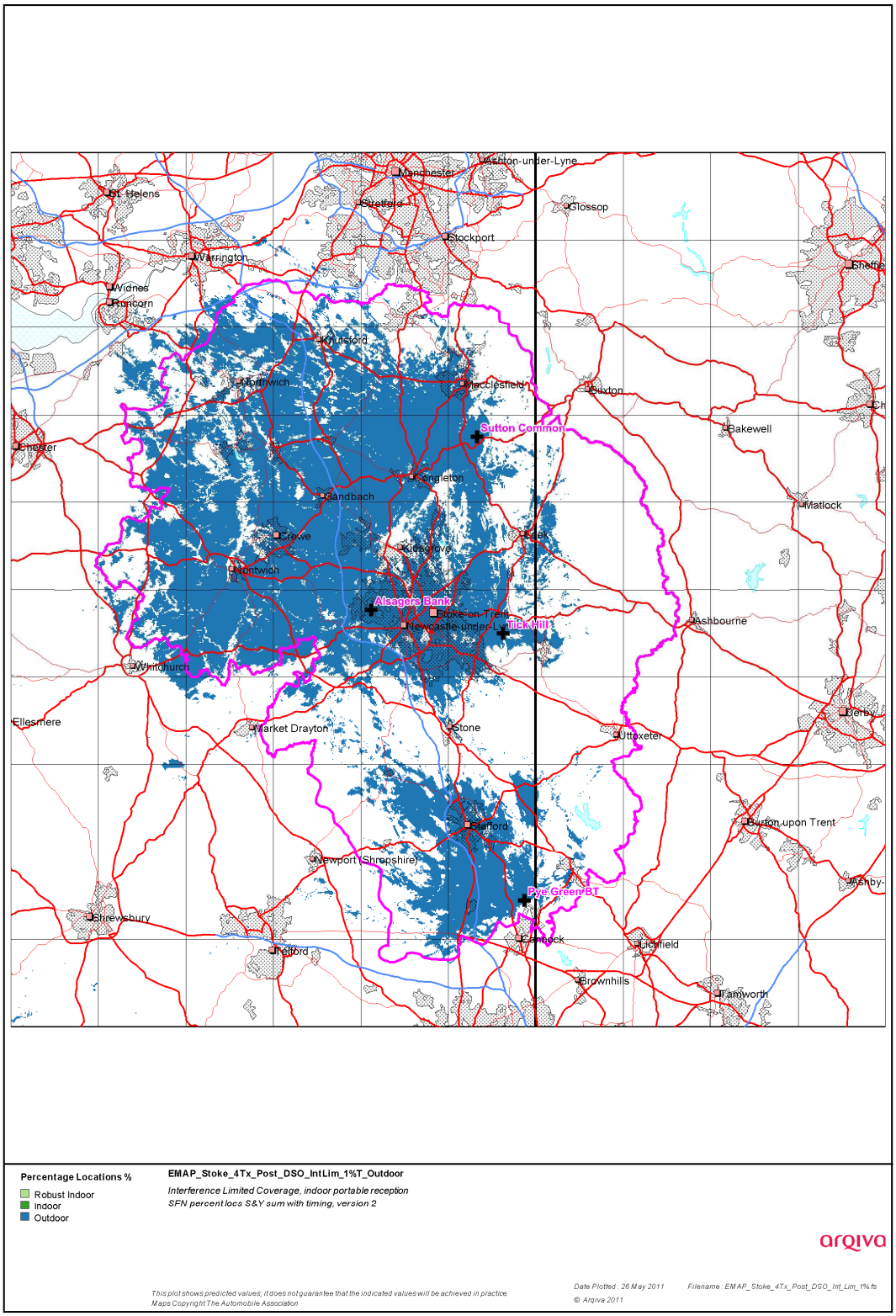


Figure 2-4. Modified Network 1 – Outdoor Only, 1% Time Interference

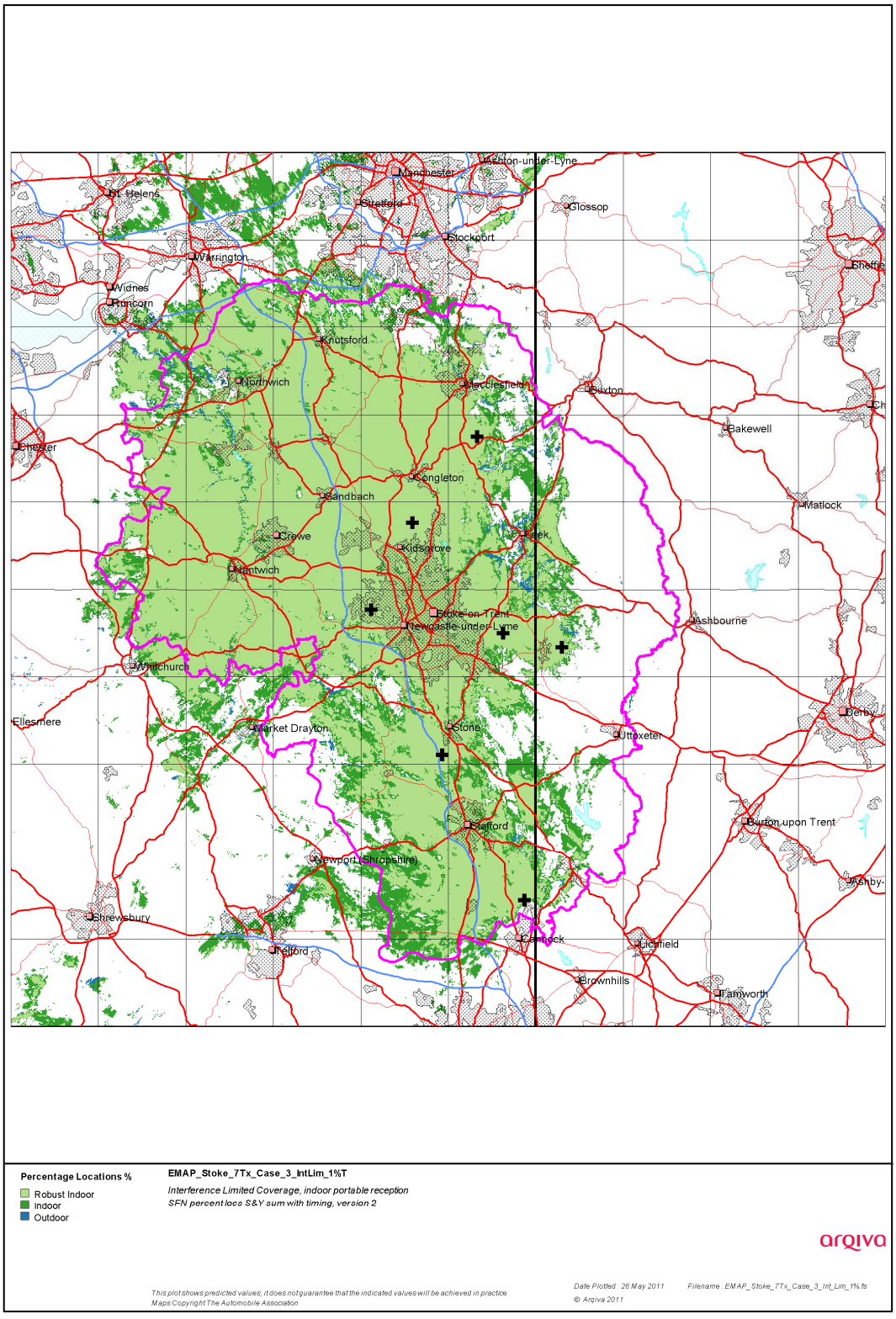


Figure 2-5. Modified Network 2

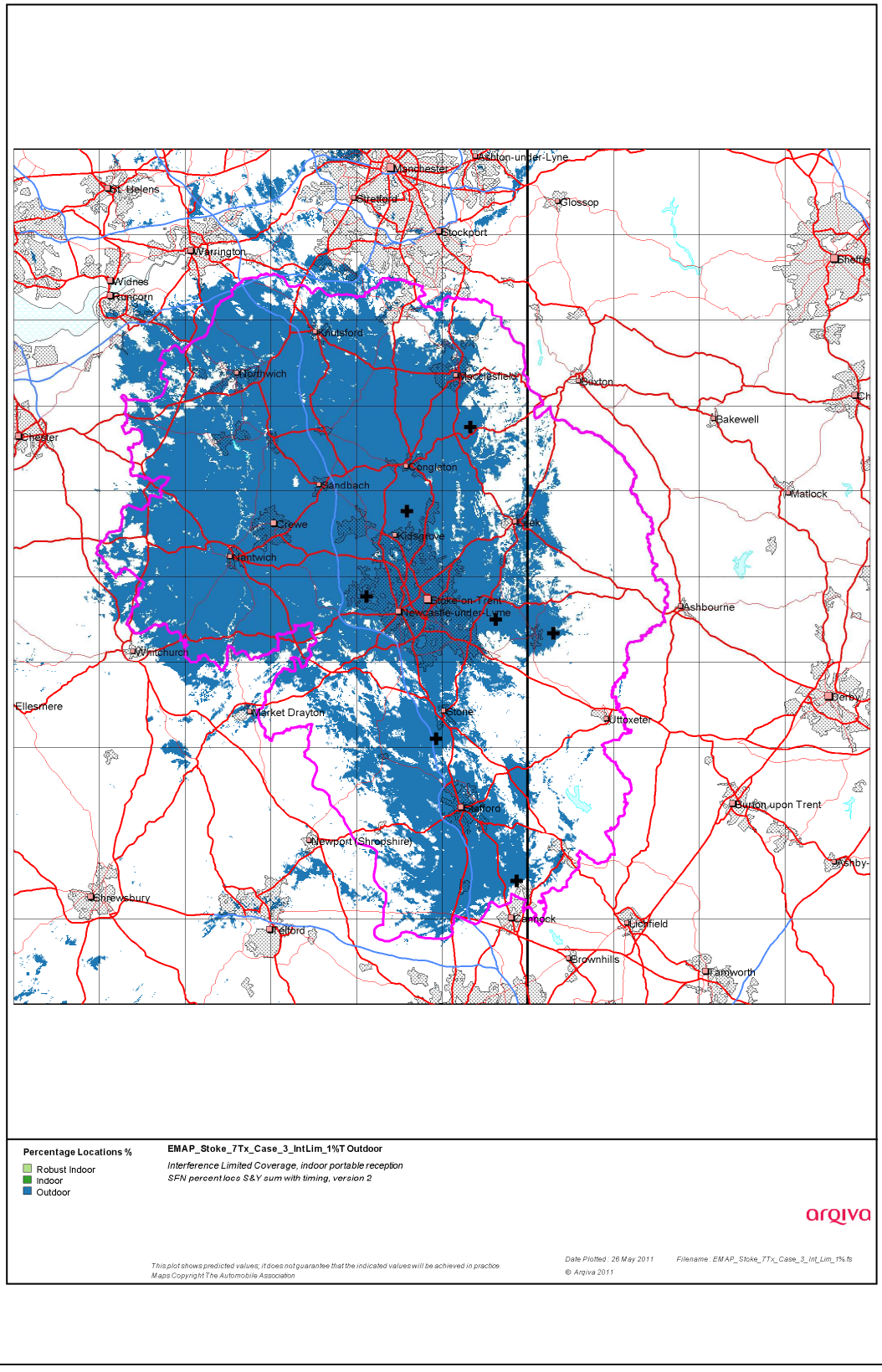


Figure 2-6. Modified Network 2 – Outdoor Only, 1% Time Interference

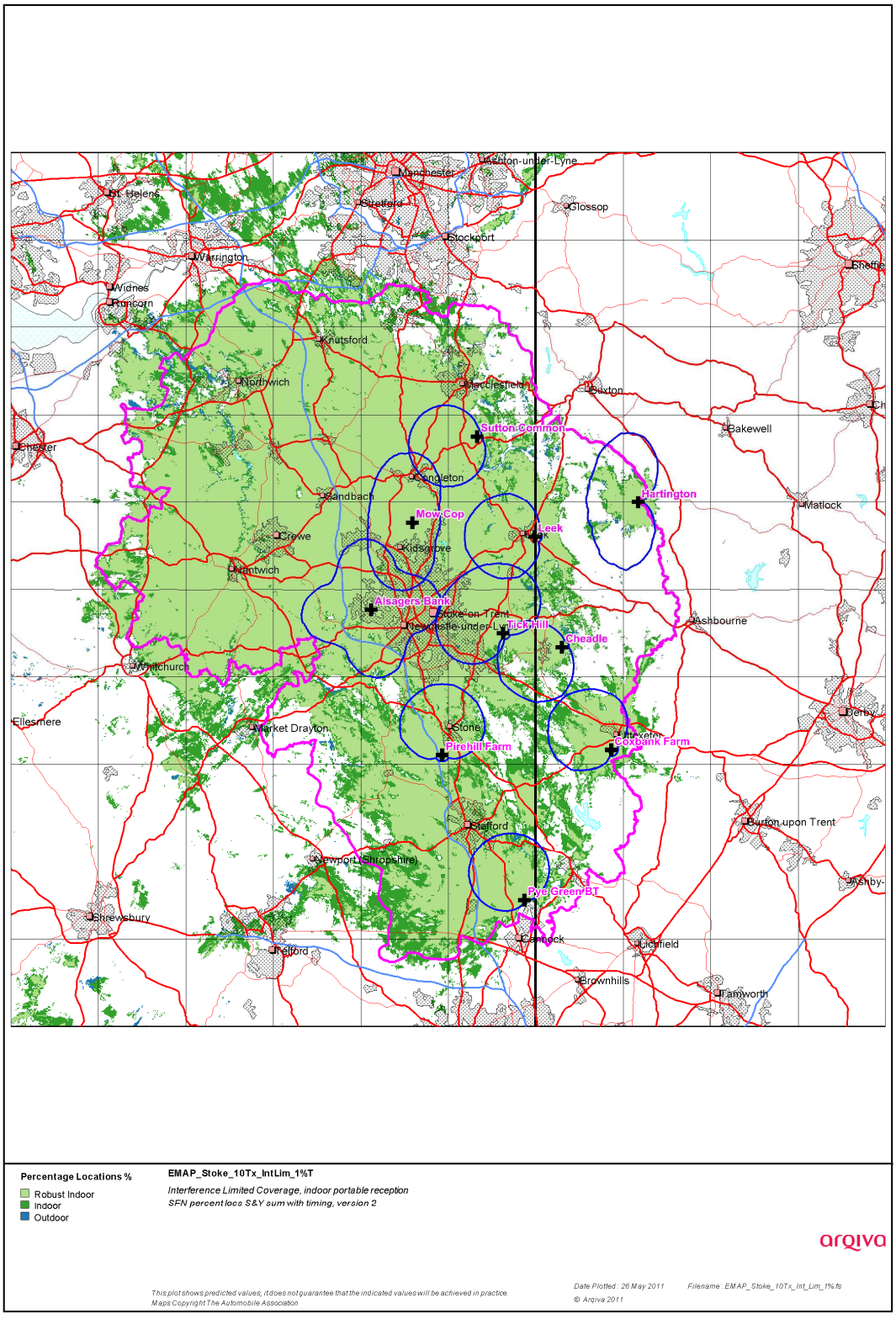


Figure 2-7. Modified Network 3

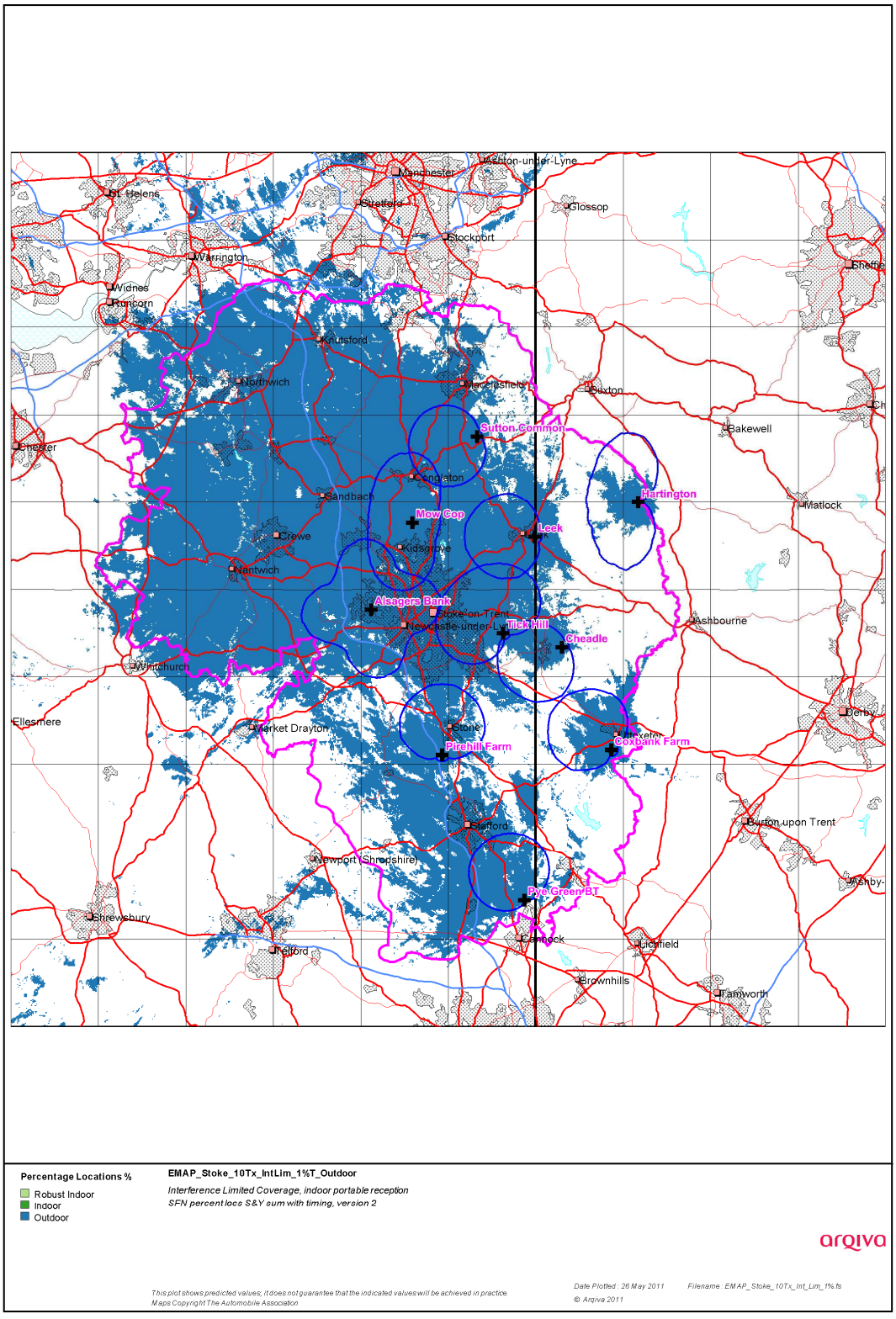


Figure 2-8. Modified Network 3 – Outdoor Only, 1% Time Interference

2.2 Population Coverage tables within Editorial Area

Table 2-1 Population - Proportional Indoor Coverage: Total households 521,779

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	-	429,417	-	-	82.30
Current (4Tx)	Existing	-	384,743	-	-	73.40
Mow Cop	New, Existing Infrastructure	232,705 (44.60%)	436,422	51,679	10.24	83.64
Leek	New	20,155 (3.86%)	444,433	8,011	1.54	85.18
Coxbank Farm	New	7,779 (1.49%)	453,208	8,775	1.68	86.86
Cheadle	New	7,148 (1.37%)	459,660	6,452	1.23	88.09
Pirehill Farm	New	10,067 (1.93%)	464,143	4,483	0.86	88.95
Hartington	New	339 (0.06%)	464,497	354	0.07	89.02

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

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

Total Roads 1,162.8 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	977.5	-	-	84.0
Current (4Tx)	Existing	689.9	-	-	59.3
Mow Cop	New, Existing Infrastructure	828.4	138.5	11.9	71.2
Leek	New	853.7	25.3	2.2	73.4
Coxbank Farm	New	878.0	24.3	2.1	75.5
Cheadle	New	898.3	20.3	1.8	77.3
Pirehill Farm	New	927.0	28.7	2.4	79.7
Hartington	New	927.2	0.2	0	79.7

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

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	429,417 (82.3%)	977.5 (84.0%)
2	384,743 (73.4%)	689.9 (59.3%)
3	448,974 (86.0%)	882.0 (75.8%)
4	464,497 (89.2%)	927.2.0 (79.7%)

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