
Digital Switchover (DSO) Programme

Radio DSO Block 11C South Yorkshire

Document Reference: Radio DSO South Yorkshire–2.1

Release Date: 8 June 2011

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Document Details

General Detail					
Abstract	South Yorkshire Radio DSO document version 2.1				
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Optional Information					
Author Defined Reference No		Not used	Project No	951224	
Cross Reference					

Document History		
Ver	Date	Amendment
000A	08/03/11	Draft version for review.
001	14/03/11	Initial release
2.0	7/6/11	Modified editorial area
2.1	8/6/11	Amended pop figures

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1 South Yorkshire DSO Narrative

The current allocation for South Yorkshire is 11C and this has not been changed. The nearest co-block multiplexes are Tyne & Wear to the north, Birmingham to the south-west and Cambridge to the south-east. These areas are shown below in Figure 1.1.

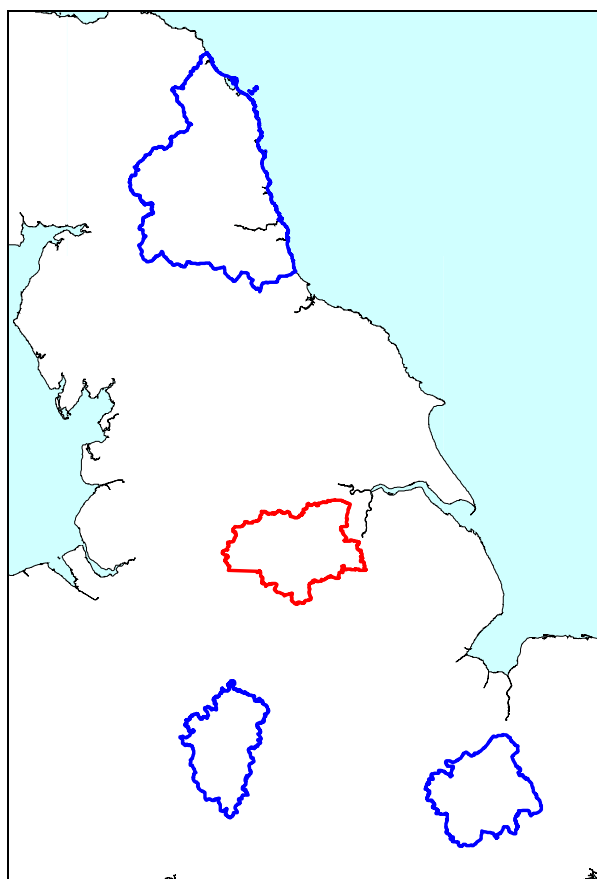


Figure 1.1: South Yorkshire – Adjacent Multiplexes

The original transmission characteristics for South Yorkshire was Tapton Hill and Clifton and were both 700W ERP, however, Tapton Hill has recently been increased to 1.1 kW, thus the current transmission characteristics are:-

Site Name	ERP	Site height m a.o.d.	Antenna height m a.g.l.	Antenna Type
Tapton Hill	1.1kW (formerly 700W)	247	48	Dipoles
Clifton	700 W	138	48	Panels

Table 1.1: South Yorkshire – Current Transmission Characteristics

The editorial area however has been significantly changed and extended. It has been extended in some places and shrunk in other areas. This is shown in Figure 1.2.

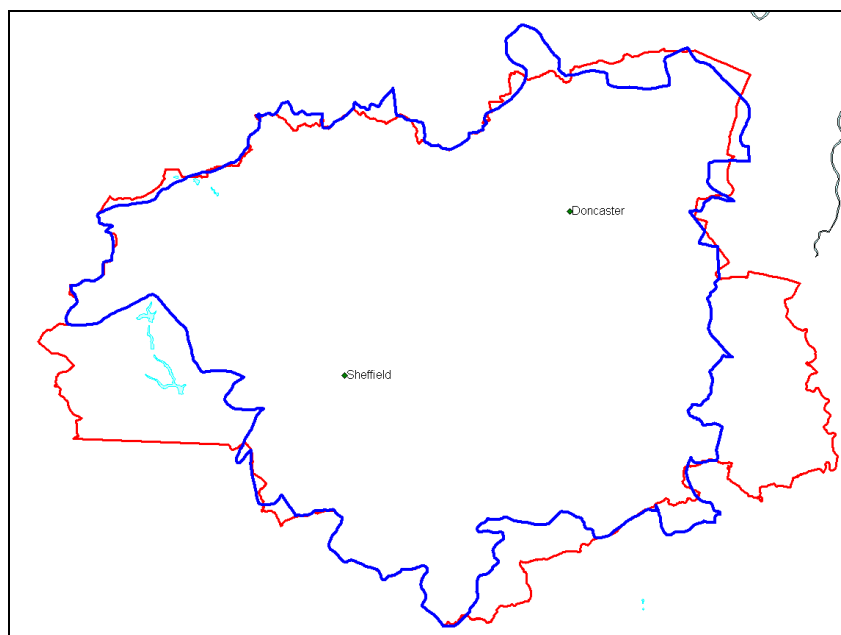


Figure 1.2 - Changes in South Yorkshire editorial area, the existing boundary is shown in blue, and the revised DSO South Yorkshire boundary is shown in red.

The South Yorkshire multiplex is surrounded by eight other multiplexes, as shown in Figure 1.3. There is some overlap to the south with the future Derbyshire and the current Nottinghamshire multiplexes; but for the local DAB services, the area is predominantly not overlapped. It seems unlikely that there will be much contribution from alternative multiplexes within the South Yorkshire multiplex.

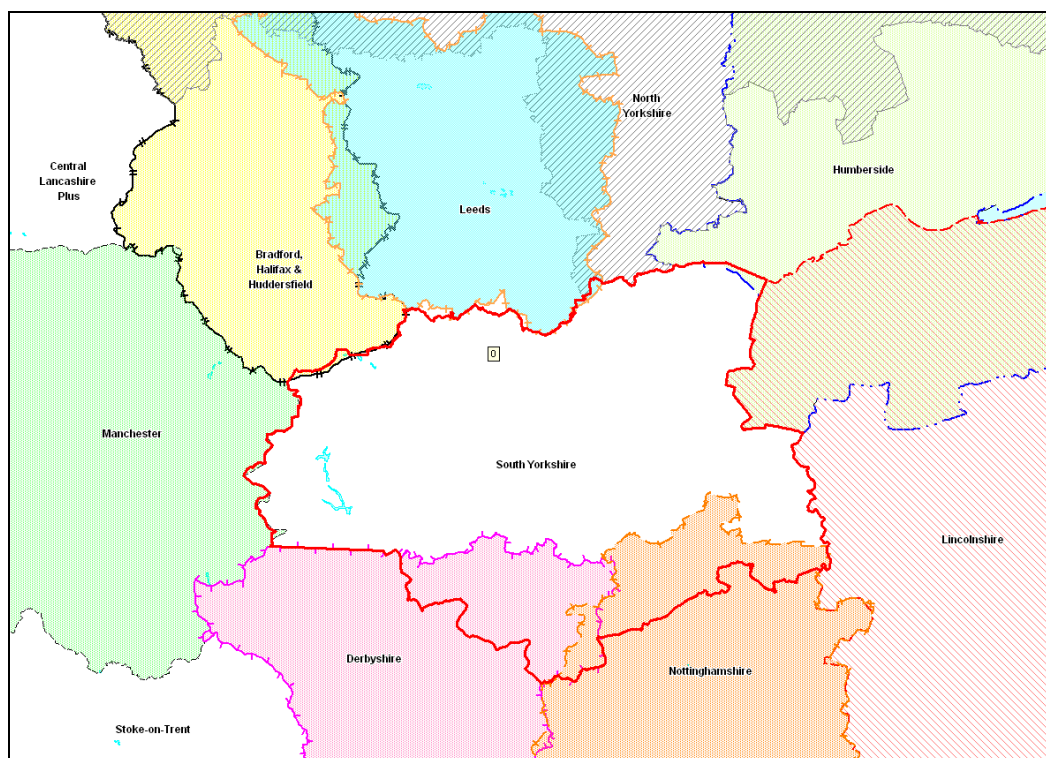


Figure 1.3: South Yorkshire – Adjacent Multiplexes

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.

1.1 Outgoing interference and sensitivity to other co-block multiplexes

1.1.1 Existing Coverage (Case 1)

South Yorkshire multiplex is quite vulnerable to co-channel interference. The existing coverage is severely restricted by co-channel interference from the Manchester, Cambridge and Tyne & Wear multiplexes, with the predominant interfering transmitters being (in order of the highest incoming interferer), Winter Hill, Madingley and Burnhope. The **noise** limited coverage for the existing coverage is shown in Figure 2.1 and the Figure 2.2 shows the coverage for existing 1% time interference limited. The major (but not exclusive) source of incoming CCI is currently Winter Hill (Manchester).

Figure 2.3 shows the mobile outdoor coverage, for case 1. This coverage is more restricted than the indoor coverage.

There is no proposal to modify the existing transmission characteristics, so no case 2, modified network 1 has proposed for South Yorkshire.

1.1.2 Proposed DSO Coverage (Case 3, Modified Network 2)

Within the DSO proposals being considered within this study, the Manchester multiplex is moving away from the 11C frequency block. This will mitigate some of the worst impact of the incoming co-channel interference for DSO options; but increases in incoming CCI from expanded services at Tyne and Wear and Cambridge which do still degrade the South Yorkshire coverage, to some extent.

To maintain a reasonable coverage, a number of additional transmitters are desirable. The South Yorkshire multiplex has some fairly large expanses in the east that have little protection afforded by the terrain; it is a relatively flat area. This area is especially vulnerable to potential incoming CCI from Cambridge DSO.

The enhanced Tyne and Wear multiplex does not significantly modify the South Yorkshire coverage. The terrain between Tyne and Wear and South Yorkshire provides reasonable protection from mutual CCI.

The additional transmitters considered are Ardsley, Stocksbridge, Chesterfield, Worksop, Shatton Edge, Grove (near Retford) and Hallam Castings (near Thorne). Chesterfield is currently used by the BBC and Digital One national services and is likely to be used for the proposed Derbyshire multiplex. This site may also be considered for use by the regional Yorkshire multiplex.

The case 3 network is predicted to be reasonably well protected from incoming co-channel interference at 1% time.

1.1.3 Expanded DSO Coverage (Case 4, Modified Network 3)

The transmitter at Shatton Edge is considered for expansion to improve the DAB mobile coverage; it does also provide a modest improvement for indoor population for the South Yorkshire multiplex.

The case 4 network is predicted to be reasonably well protected from incoming co-channel interference at 1% time.

2 Coverage of 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 included with this report

Figure 2.1

Case 1 -Current NOISE limited coverage for South Yorkshire (*2 transmitters*)

Figure 2.2

Case1 - Current interference limited coverage for South Yorkshire, 1% time - (*2 transmitters*)

Figure 2.3

Case 1 - Mobile outdoor Coverage for Current interference limited for South Yorkshire, 1% time - (*2 transmitters*)

There is no case 2 coverage map.

Figure 2.4

Case 3, Interference limited coverage for South Yorkshire, Modified network 3 - (*8 transmitters*)

Figure 2.5

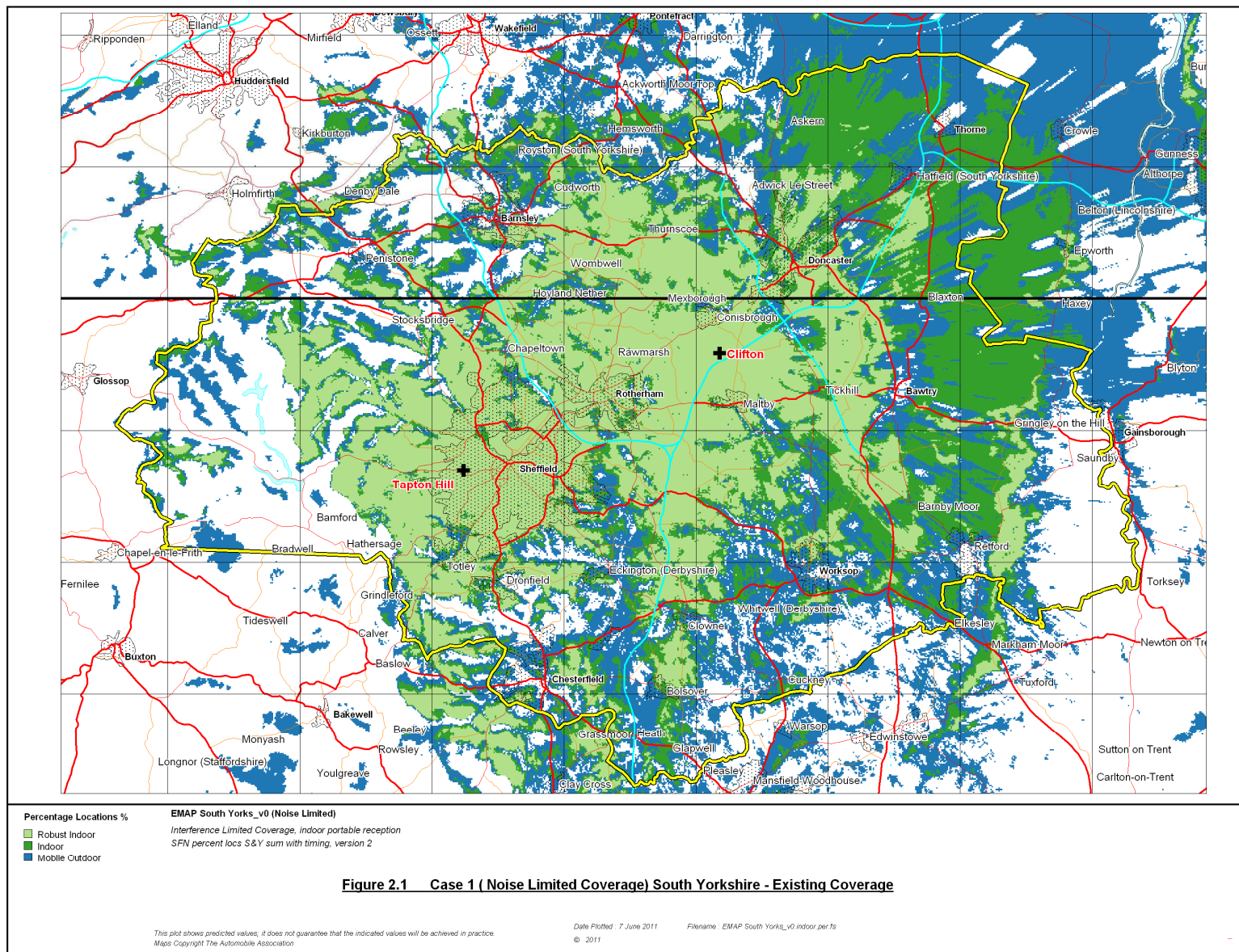
Case 3, Mobile outdoor Coverage for Current interference limited for South Yorkshire - Modified network 3- 1% time (*8 transmitters*)

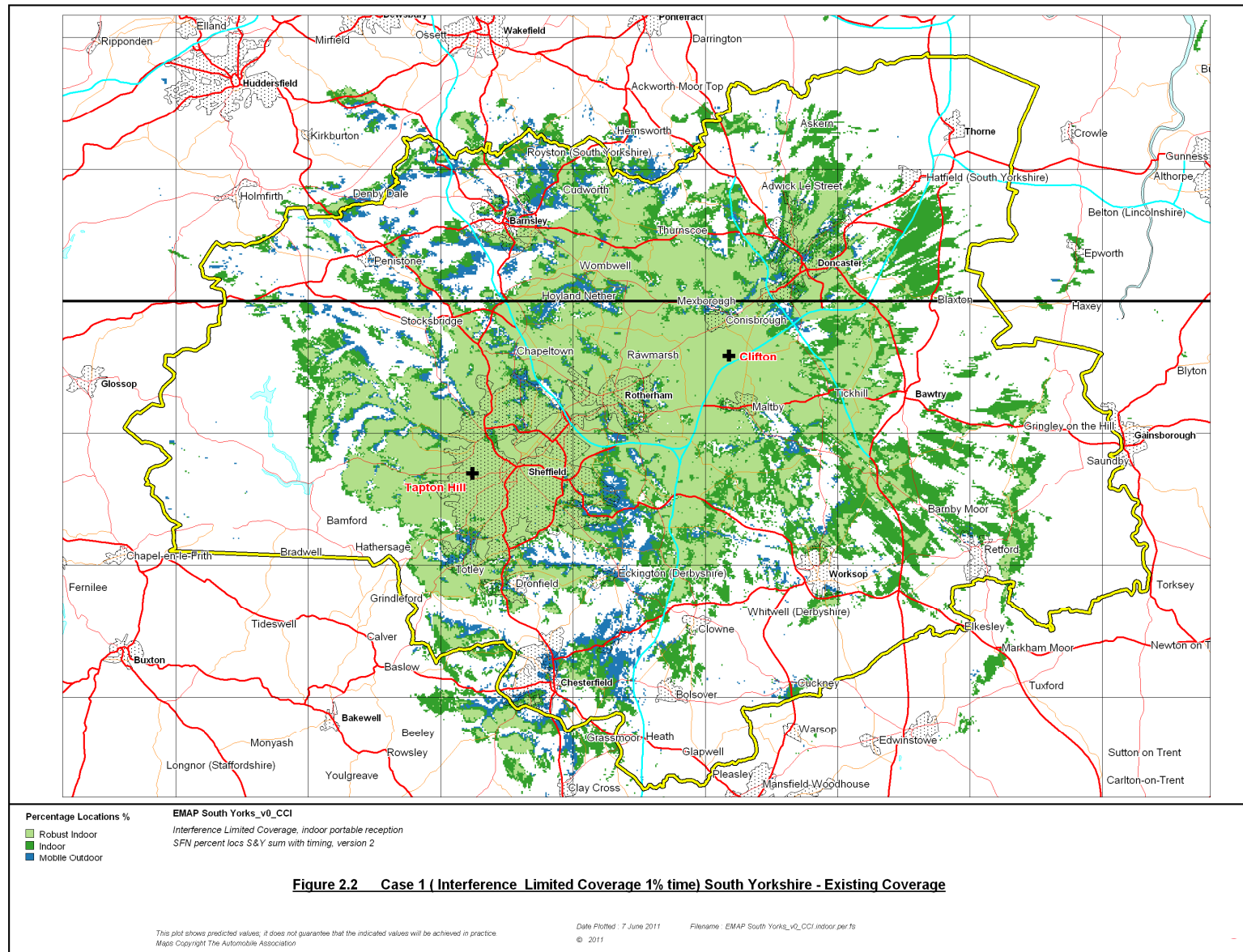
Figure 2.6

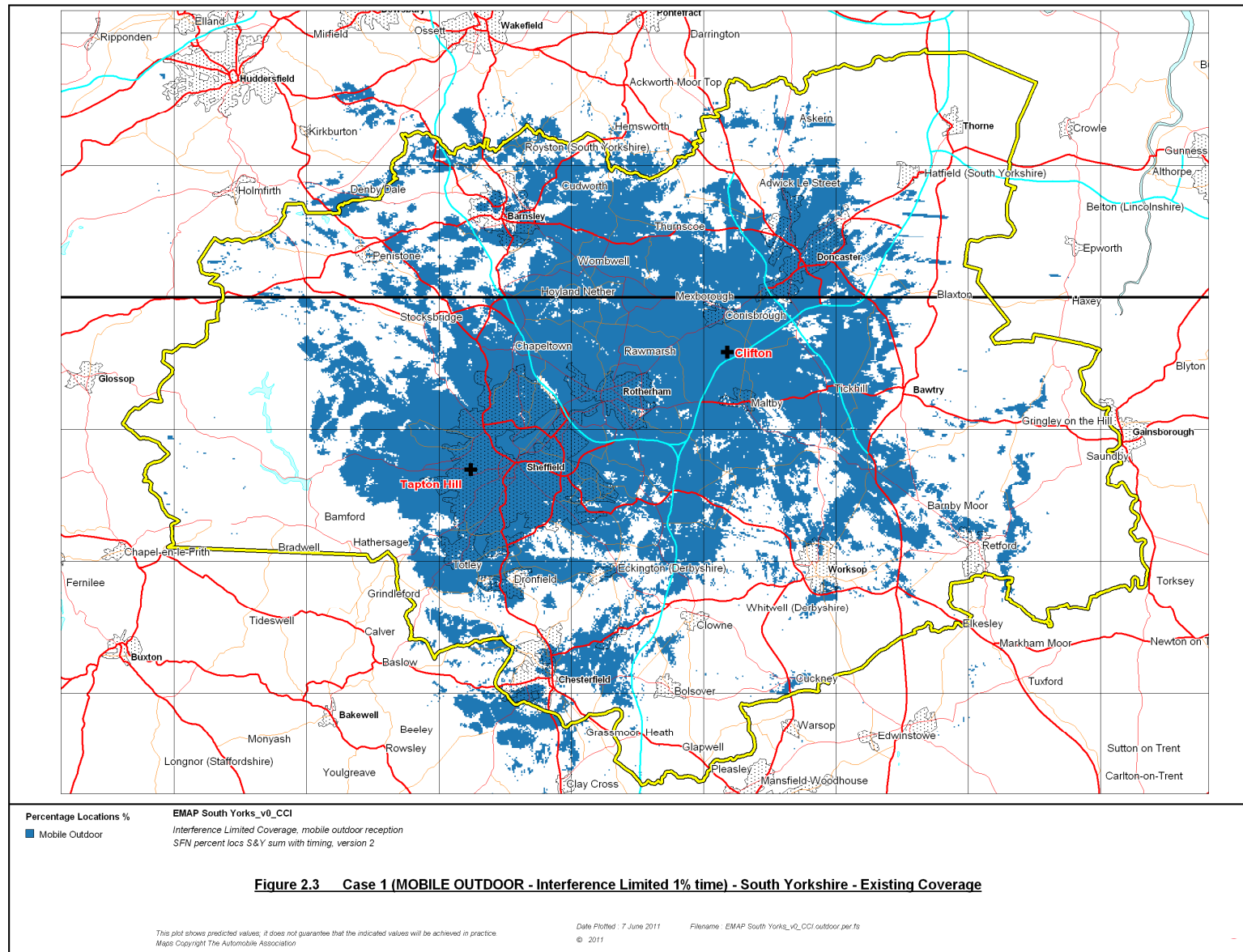
Case 4, Interference limited coverage for South Yorkshire, Modified network 4 - 1% time (9 sites)

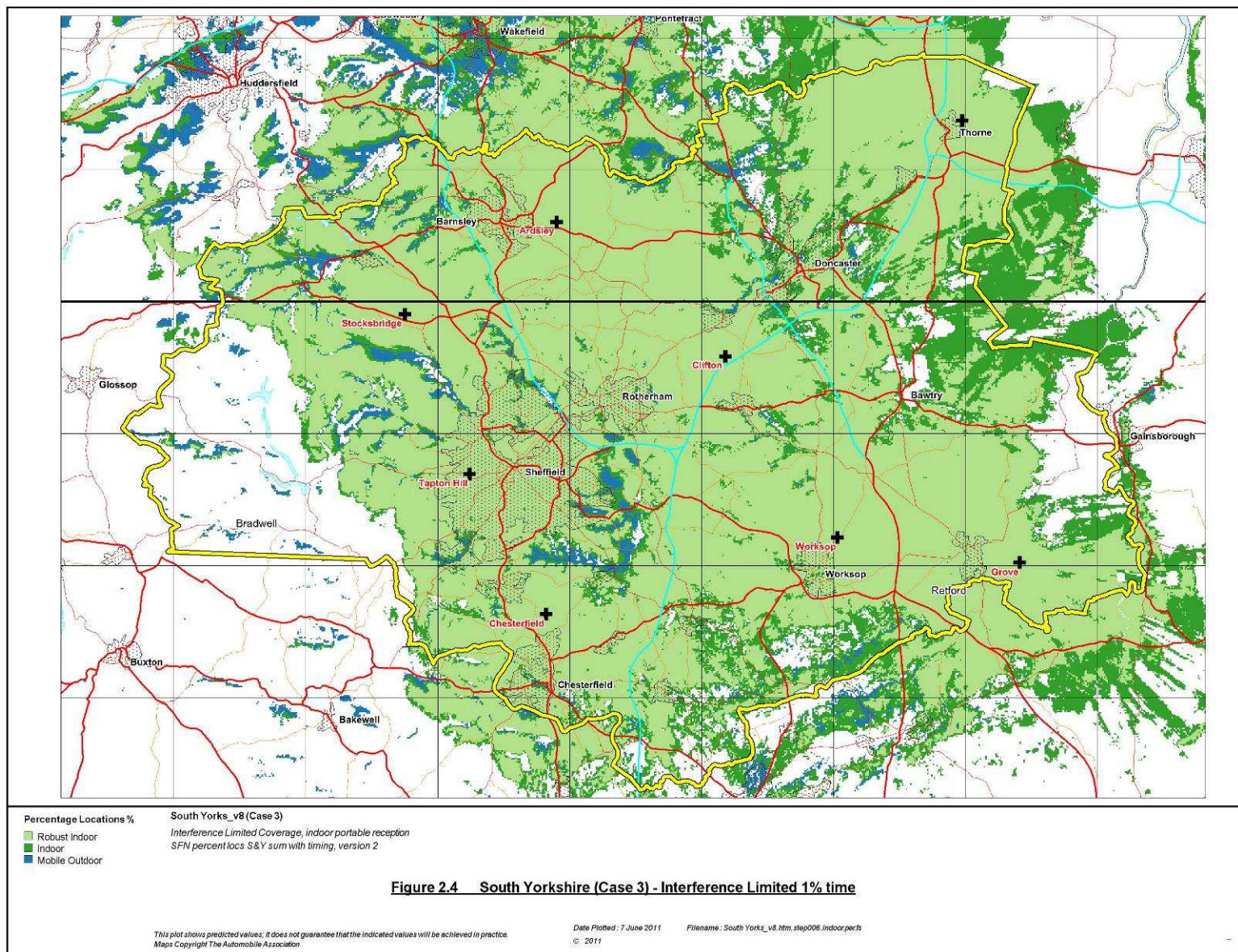
Figure 2.7

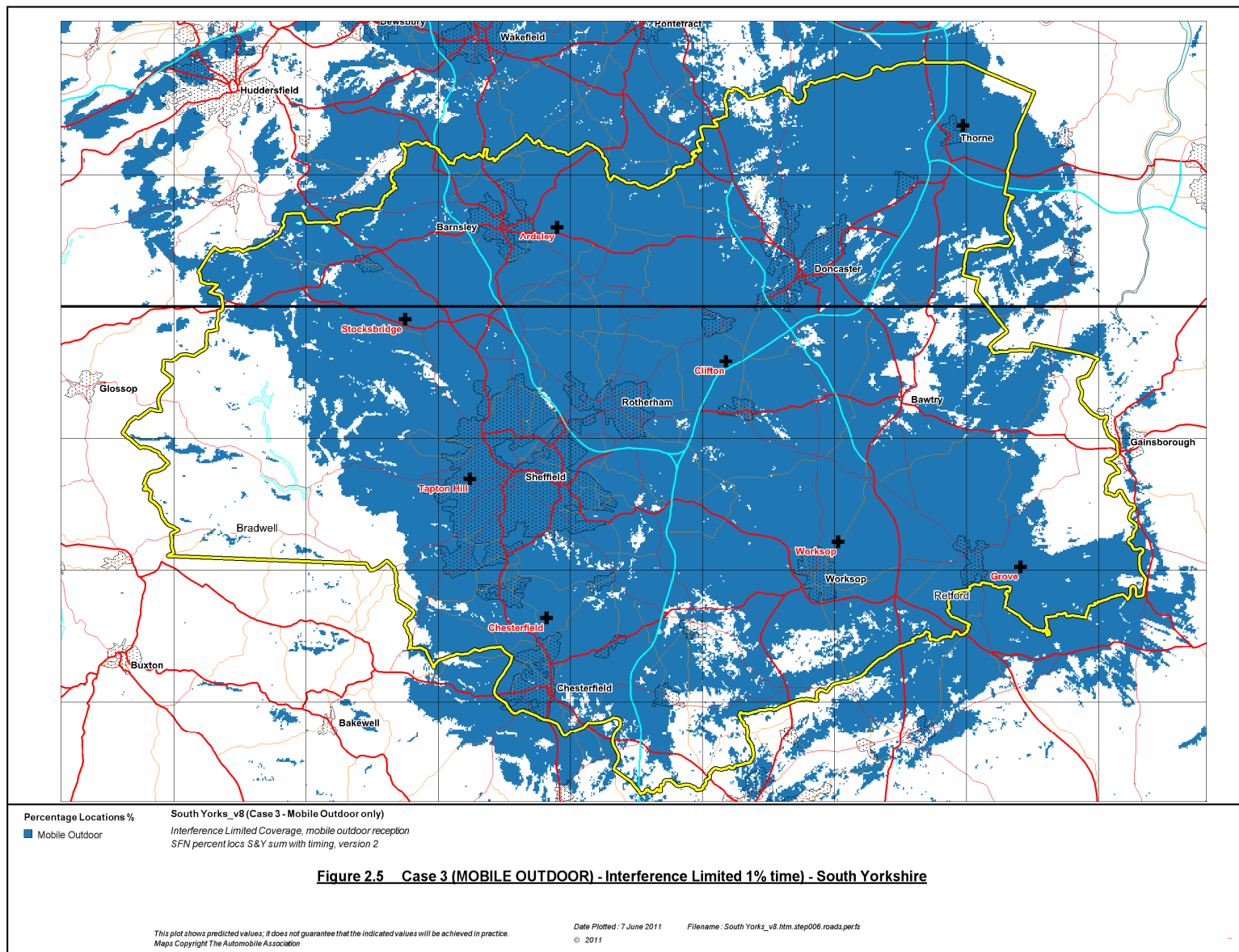
Case 4, Mobile Outdoor interference limited coverage for South Yorkshire, Modified network 4 - 1% time (9 sites)

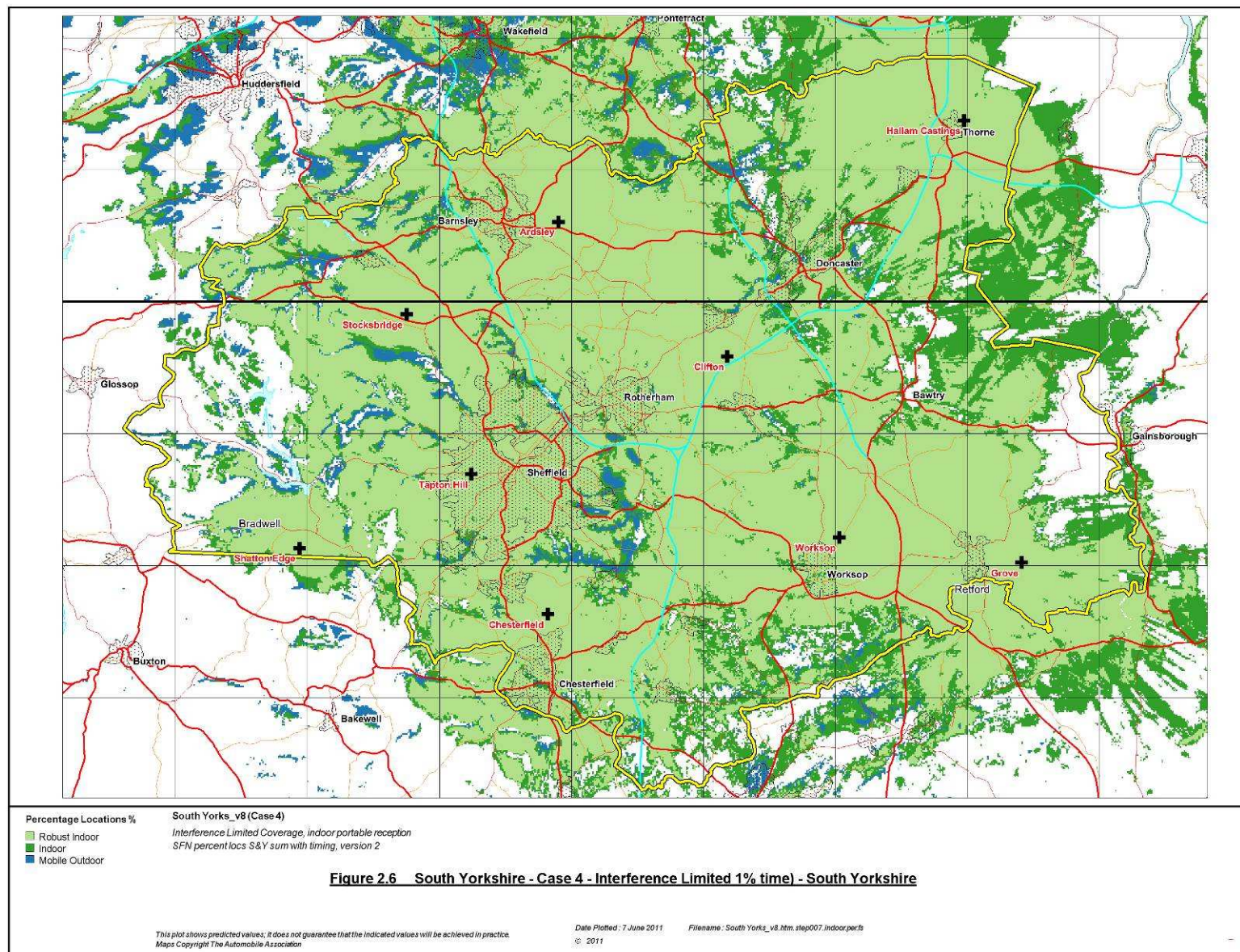


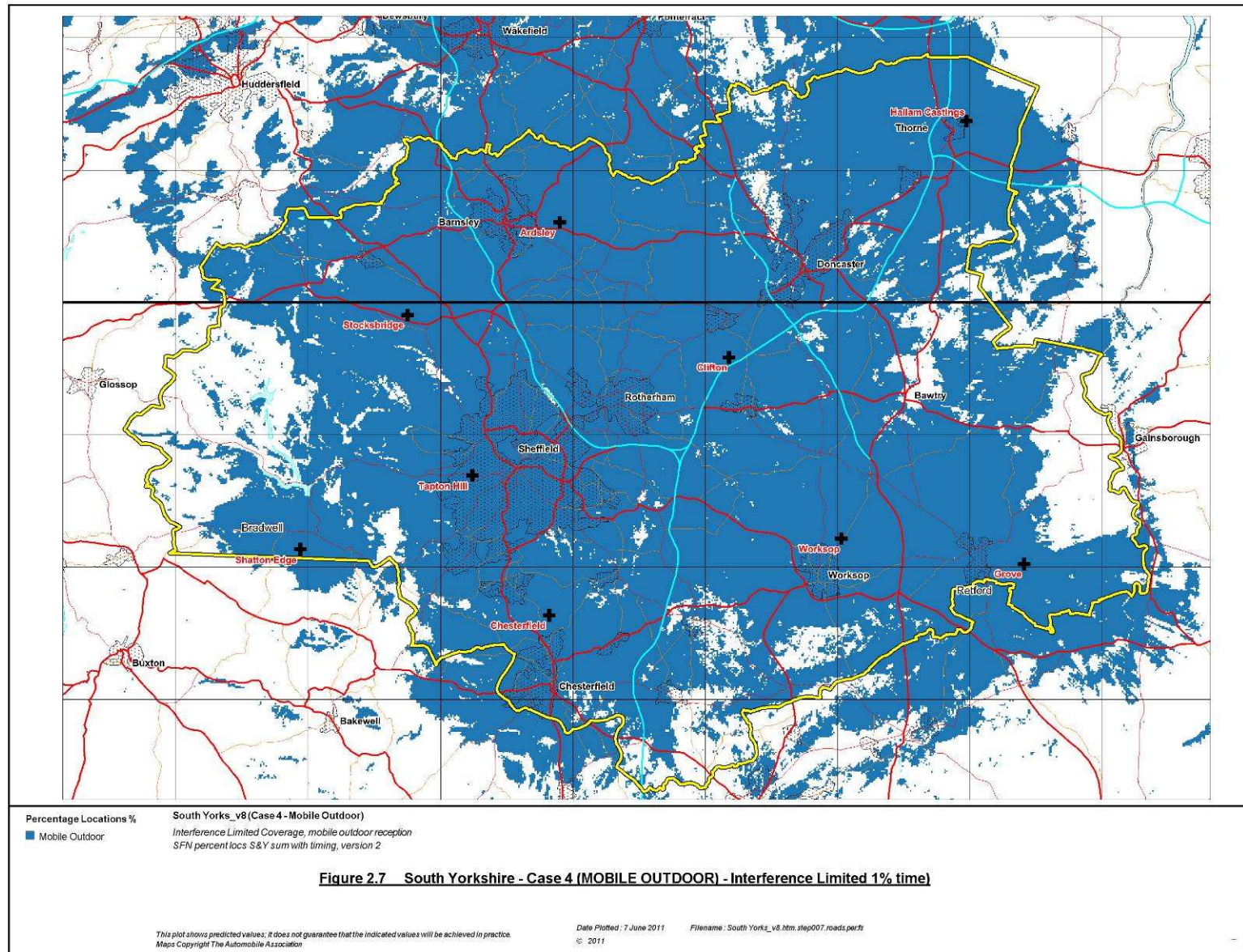












2.2 Population Coverage Tables

The following population tables Table 2.1 and Table 2.2 are colour coded thus:-

Existing South Yorkshire Case 1 (2 transmitters)

- Light Yellow = Existing sites unchanged)

Case 2 Not applicable

Case 3 (8 transmitters)

- Light yellow + light blue = modified network 2

Case 4 (9 transmitters)

- Light yellow + light blue + light green = modified network 3

Table 2-1. Population coverage proportional indoor 739,298 99%T

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 (2 Tx)	Existing DAB sites		477,447			64.58%
Ardsley	Existing FM site	148,987 (20.15%)	544,694	67,247	9.10%	73.68%
Chesterfield	Shared DAB site	79,571 (10.76%)	607,297	62,604	8.47%	82.15%
Stocksbridge	New Site	68,273 (9.23%)	625,797	18,500	2.50%	84.65%
Grove	New Site	21,480 (2.91%)	658,252	32,455	4.39%	89.04%
Hallam Castings	New Site	14,006 (1.89%)	682,369	24,117	3.26%	92.30%
Worksop	New Site	23,858 (3.23%)	696,157	13,788	1.86%	94.16%
Shatton Edge	New Site	3,117 (0.42%)	701,167	5,010	0.68%	94.84%

Table 2-2. Road coverage 99% locations, 99%T: Total 982.8 km

Site scenario and incremental additional sites	Site Type	Total road length in km	Increase in number of road length in km	Incremental percentage increase of road length	Percentage of roads within the editorial area
Current (2 Tx)	Existing DAB sites	507.1			51.59%
Ardsley	Existing FM site	581.2	74.2	7.55%	59.14%
Chesterfield	Shared DAB site	644.3	63.0	6.41%	65.55%
Stocksbridge	New Site	690.9	46.7	4.75%	70.30%
Grove	New Site	766.0	75.1	7.64%	77.94%
Hallam Castings	New Site	829.2	63.2	6.43%	84.37%
Worksop	New Site	862.6	33.3	3.39%	87.76%
Shatton Edge	New Site	886.6	24.0	2.44%	90.21%

Table 2-3. Summary of Coverage within Editorial Area for Each Case

Case	Indoor Household (& percentage coverage)	Mobile Road Coverage (& percentage coverage) 99% locations
1	477,447 (64.58%)	507.1 (51.59%)
2	No Case 2	
3	696,157 (94.16%)	862.6 (87.76%)
4	701,167 (94.84%)	886.6 (90.21%)

- Case 1 - Light Yellow = existing sites unchanged
- Case 2 - No case 2
- Case 3 - Yellow + blue = modified network 2
- Case 4 - Yellow + blue + green = modified network 3