
Digital Switchover (DSO) Programme

Radio DSO Block 11C Swindon

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1 Swindon DSO Narrative

The current allocation for Swindon is 11C and this has not been changed. The nearest co-block multiplexes are (clockwise from the north) Birmingham, Cambridge, Kent, South Hampshire, Exeter and Torbay and Cardiff and Newport. These areas are shown below in Figure 1.1; the Swindon multiplex is shown in red

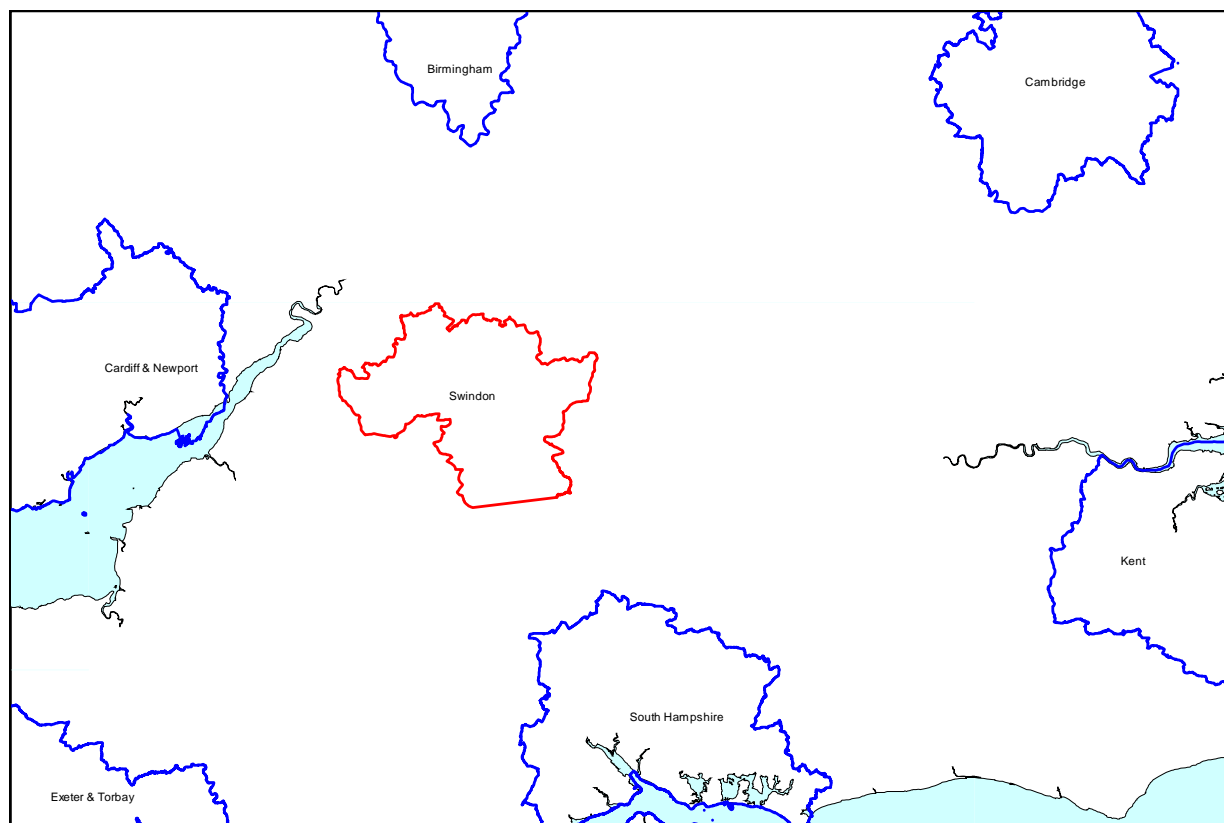


Figure 1.1: Swindon (shown in red) – Adjacent 11C Multiplexes

There are currently three transmitters on air for the Swindon multiplex; these are shown in Table 1.1.

Site Name	ERP	Site height m a.o.d.	Antenna height m a.g.l.	Antenna Type
Blunsdon	1.25 kW	148	37	Panels
Marlborough	200 W	191	44	Cardioids
Membury	1 kW	211	112	Dipoles

Table 1.1: Swindon – Current Transmission Characteristics

The editorial area for Swindon has been reduced to the south and south-east, removing substantial overlaps with the current West Wiltshire multiplex.

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.

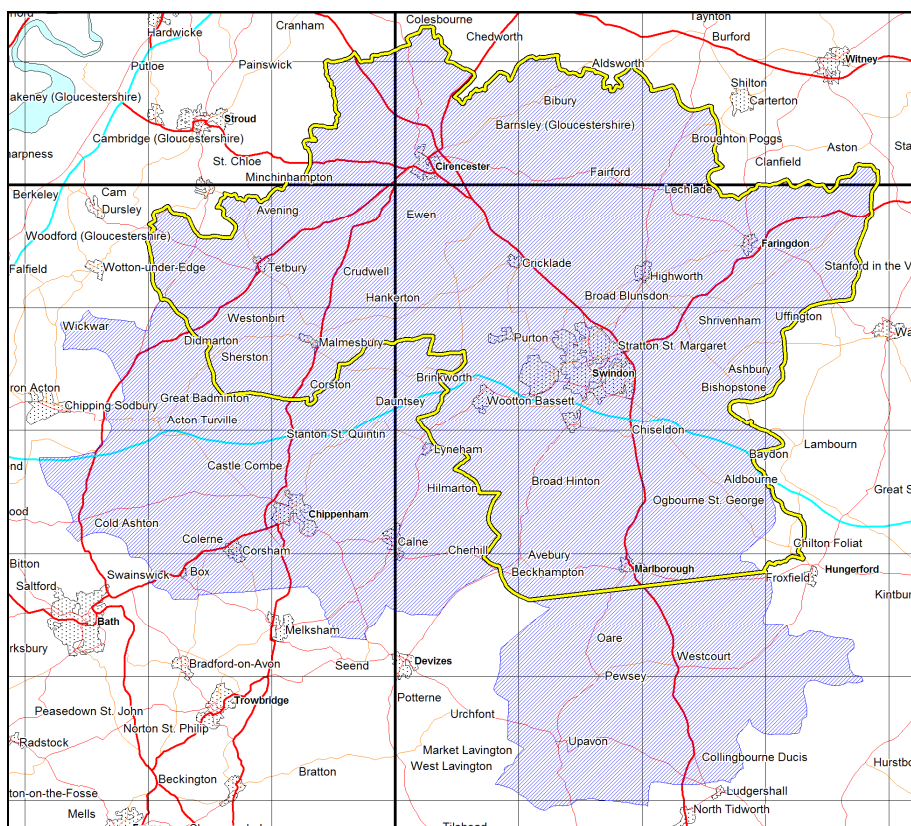


Figure 1.2 - Changes in Swindon editorial area

Existing area is shown in Blue and the new editorial area is shown in Yellow

The Swindon multiplex is surrounded by five other multiplexes, as shown in Figure 1.3. The other adjacent multiplexes (clockwise) are Oxfordshire, Reading & Basingstoke, West Wiltshire, Bristol & Bath and Gloucestershire.

There are substantial overlaps with the Gloucestershire and the Oxfordshire multiplexes.

The Bristol & Bath, Swindon, West Wilts and Reading and Basingstoke multiplexes are on air. The Gloucestershire and Oxfordshire multiplexes are not yet on air.

There is some coverage envisaged from the proposed Gloucestershire multiplex plans, around the Cirencester area in the overlap area with the Swindon multiplex.

In the overlap area with the Oxfordshire multiplex, the plans for this multiplex envisage coverage up to and including the area around Farringdon.

There is also a possibility of overlap with the Reading & Basingstoke multiplex, if this multiplex should utilise the Membury transmitter.

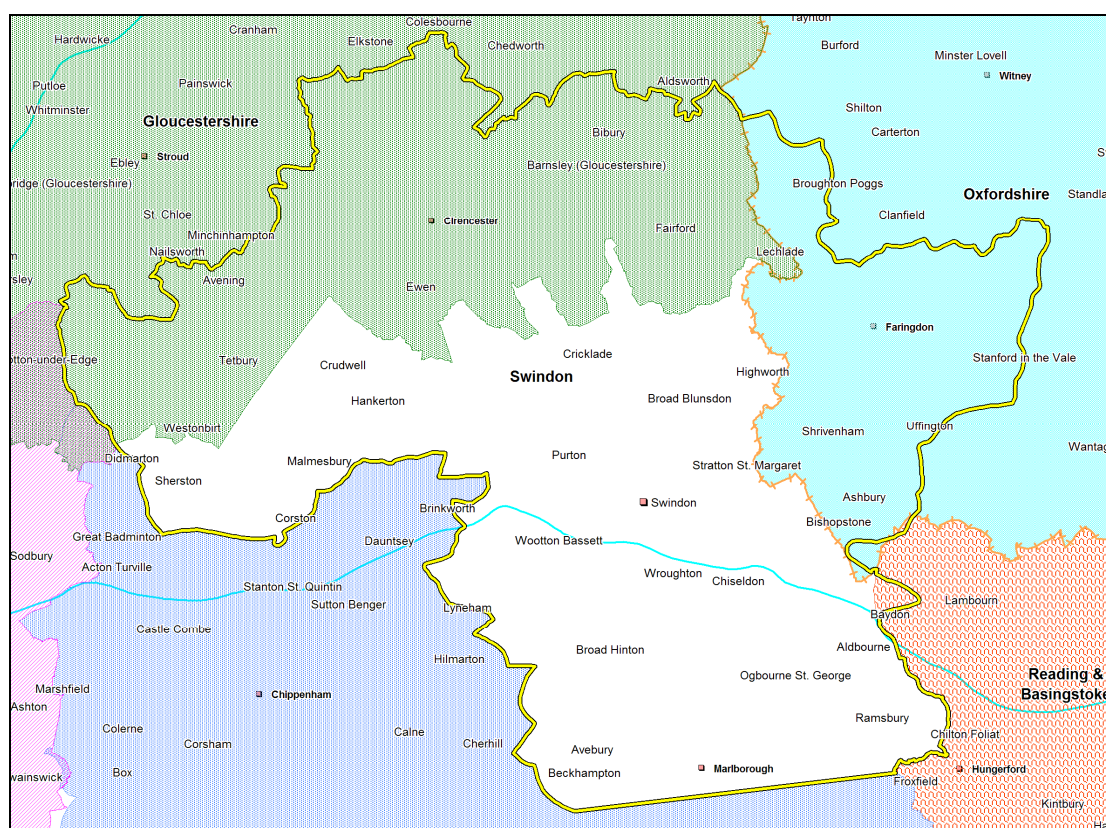


Figure 1.3: Swindon – Adjacent Multiplexes

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)

The noise limited coverage for Swindon is shown in Figure 2.1, misleadingly good, when compared to the existing interference limited coverage shown in figure 2.2. The existing Swindon coverage is limited by the Cardiff and Newport, South Hampshire, Birmingham and Kent multiplexes.

Figures 2.12 and 2.13 show the 50% time interference for the current case 1 situation, these plots indicate the level of continuous interference affecting the western and southern parts of the editorial area.

The higher terrain in the north-west and south-east of the Swindon editorial area is particularly vulnerable to incoming co-block interference. See Figure 1.4.

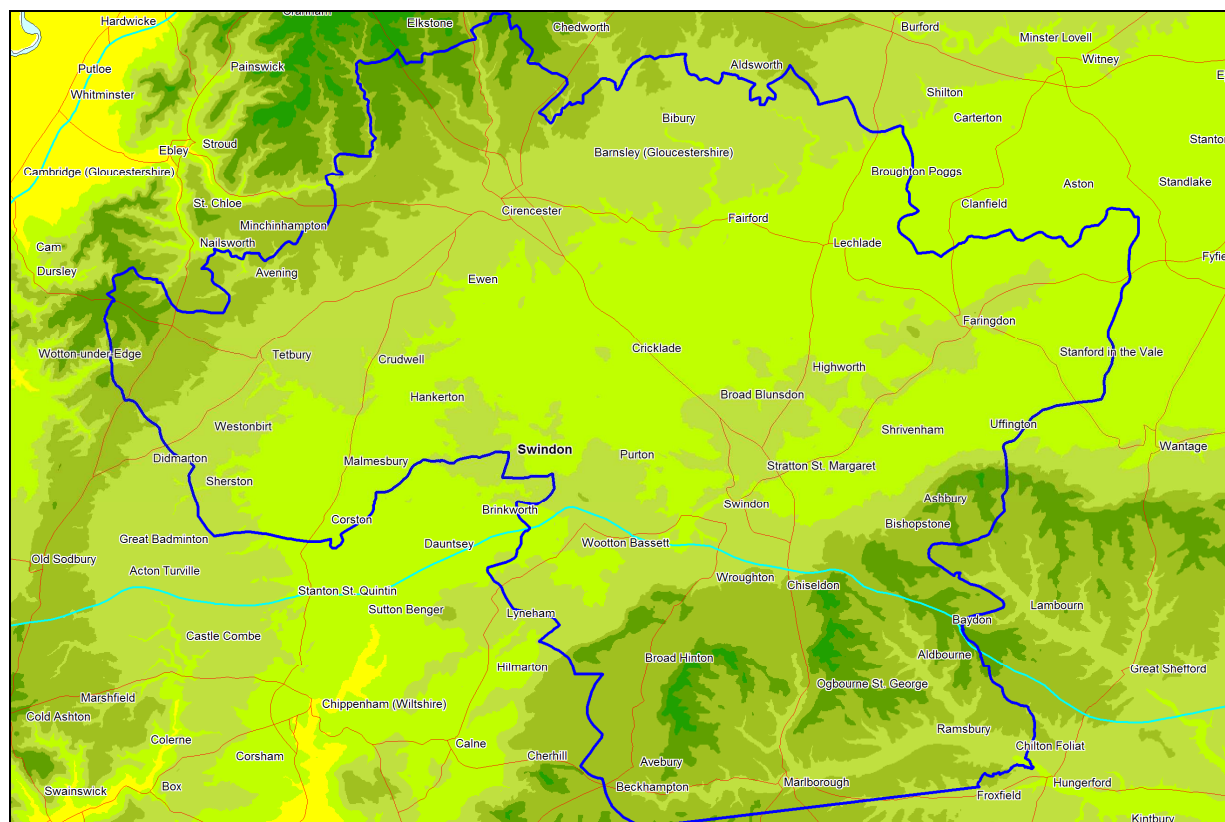


Figure 1.4 Swindon Multiplex – terrain.

1.1.2 Proposed DSO Coverage (Case 2, Modified Network 1)

Due to the proximity of the co-block multiplexes for Swindon 11C, the larger transmitters at Swindon haven't been considered for increases in ERP at this stage. There is already some impact from outgoing co-block interference from this multiplex, and it was felt that increasing Membury or Blunsdon would exacerbate the impact of co-block interference from Swindon.

It was felt that the Marlborough transmitter could be reasonably increased in ERP from 200W to 400W without significant impact on the co-block multiplexes.

The interference limited coverage map for Case 2, 'Modified Network 1', 1% time is shown in Figure 2.4, as the mobile coverage is more vulnerable to interference Figure 2.5 shows only the Mobile coverage for Case 2, 'Modified Network 1', 1% time.

For information Figures 2.6 (indoor coverage) and 2.7 (mobile outdoor) shows the 5% time, interference limited coverage for Case 2, 'Modified Network 1'.

1.1.3 Expanded DSO Coverage (Case 3, Modified Network 2)

In order to improve the covering for the Swindon multiplex, the following transmitters have been considered to endeavour to provide DAB coverage where there is robust FM coverage. The transmitters included are: - Tetbury, Malmesbury, Cirencester, Chiseldon, Ogbourne St George, and Bampton Castle S.

Sites to reinforce the coverage around the areas of Wootton Bassett and Wroughton could not be identified.

The Naish Hill site (currently used by the Wiltshire multiplex) would improve the southern edge of the Swindon editorial boundary, but was ruled out at this stage, it significantly increases the risk of co-block interference to the Cardiff and Newport multiplex. In addition any coverage from this site (as it is on air for Wiltshire multiplex) provides a limited service for an overlapping coverage (but not an overlapping editorial area).

In planning the other 11C multiplexes, some of the transmitters considered for them have been limited to try and keep the Swindon multiplex usable. The transmitters limited for this reason have been Lichfield (Birmingham), Mynydd Machen and Rhymney (Cardiff & Newport), Hannington (South Hampshire) and Sandy Heath (Cambridge).

The interference limited coverage map for Case 3, 'Modified Network 2', 1% time is shown in Figure 2.8, as the mobile coverage is more vulnerable to interference Figure 2.9 shows only the Mobile coverage for Case 3, 'Modified Network 2', 1% time.

For information Figures 2.10 (indoor coverage) and 2.11 (mobile outdoor) shows the 5% time, interference limited coverage for Case 3, 'Modified Network 2'.

Figures 2.14 and 2.15 show the 50% time coverage's (continuous) indicating the significantly affected coverage in the western and southern parts of the editorial area.

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

No further transmitters have been added for a Case 4, 'Modified Network 3' at this stage. The vulnerability of this network to interference means that to improve the Swindon multiplex further would impact of other co-block multiplexes.

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 Swindon - (3 transmitters)

Figure 2.2

Case1 - Current interference limited coverage for Swindon, 1% time - (3 transmitters)

Figure 2.3

Case 1 - Mobile outdoor Coverage for Current interference limited for Swindon, 1% time - (3 transmitters)

Figure 2.4

Case 2, Interference limited coverage for Swindon, Modified network 1-(3 transmitters)

Figure 2.5

Case 2, Mobile outdoor Coverage interference limited for Swindon - Modified network 1- 1% time (3 transmitters)

Figure 2.6

Case 2, 5% time - Interference limited coverage for Swindon, Modified network 1-(3 transmitters)

Figure 2.7

Case 2, 5% time -Mobile outdoor Coverage interference limited for Swindon-Modified Network 1 (3 transmitters)

Figure 2.8

Case 3, Interference limited coverage for Swindon, Modified network 2-(8 transmitters)

Figure 2.9

Case 3, Mobile outdoor Coverage interference limited for Swindon - Modified network 2- 1% time (8 transmitters)

Figure 2.10

Case 3, 5% time - Interference limited coverage for Swindon, Modified network 2-(8 transmitters)

Figure 2.11

Case 3, 5% time -Mobile outdoor Coverage interference limited for Swindon-Modified Network 2 (8 transmitters)

Figure 2.12

Case 1 50% time – interference limited coverage for Swindon (3 transmitters)

Figure 2.13

Case 1 - Mobile outdoor Coverage for Current interference limited for Swindon,
50% time - (*3 transmitters*)

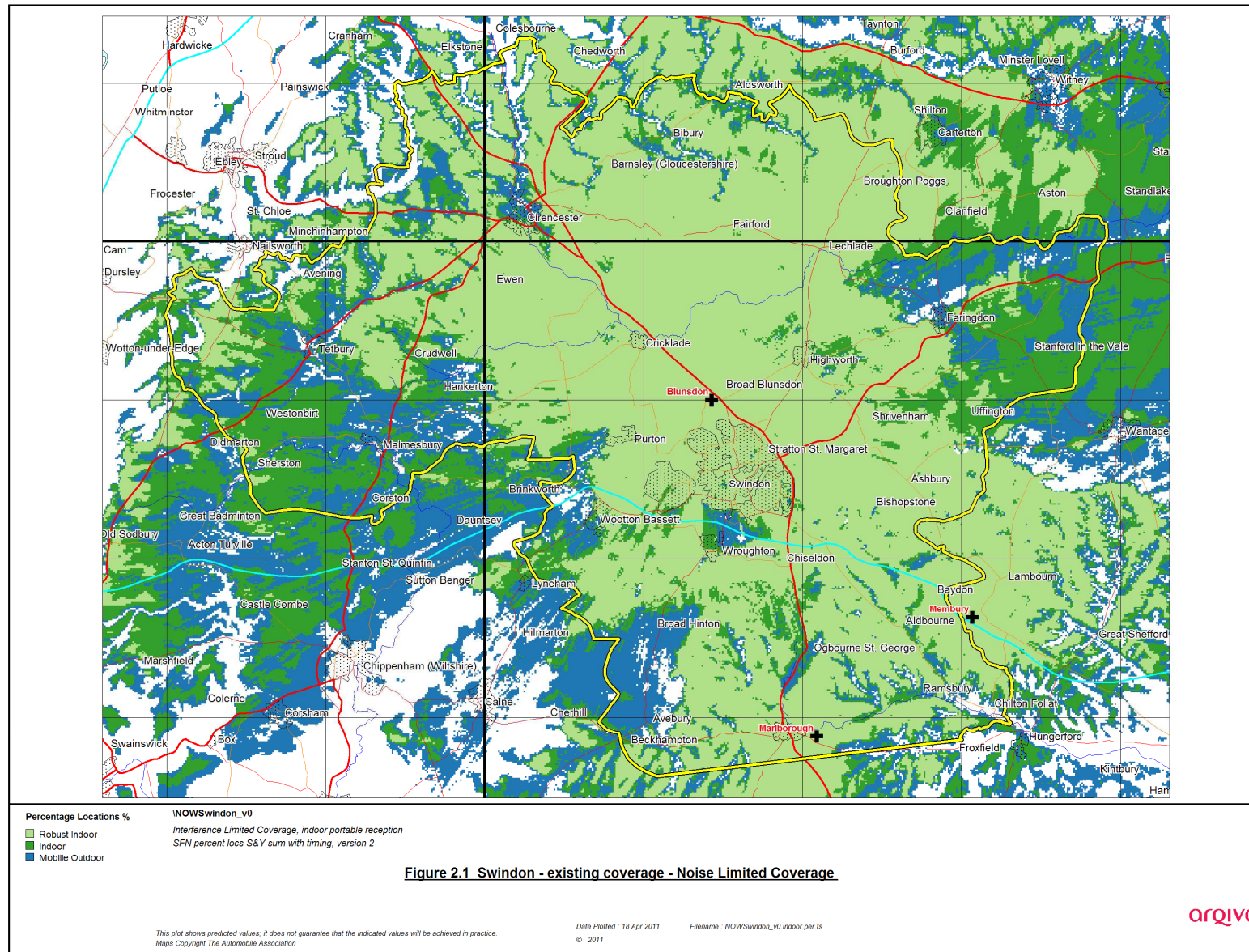
Figure 2.14

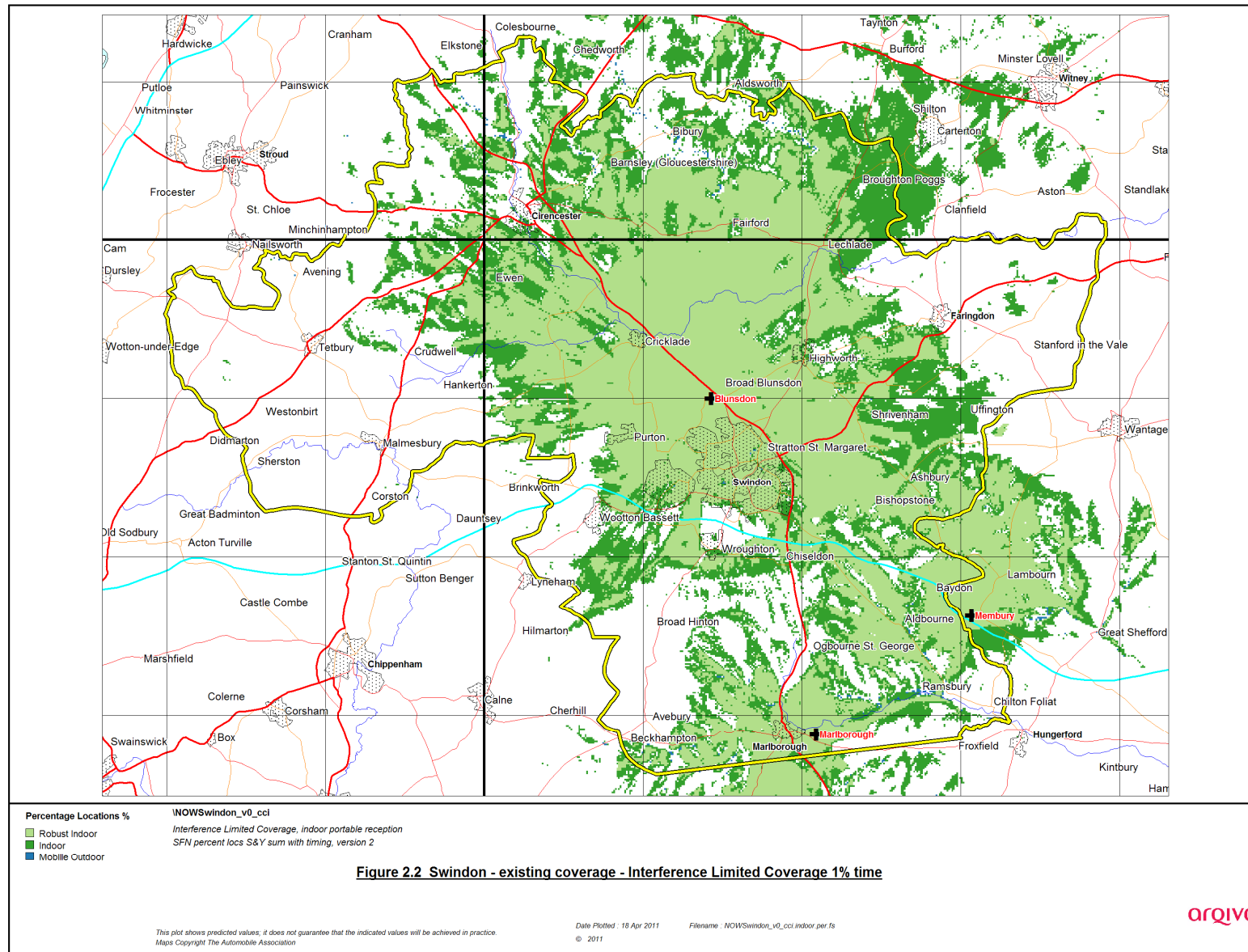
Case 3, 50% time - Interference limited coverage for Swindon, Modified network 2- (*8 transmitters*)

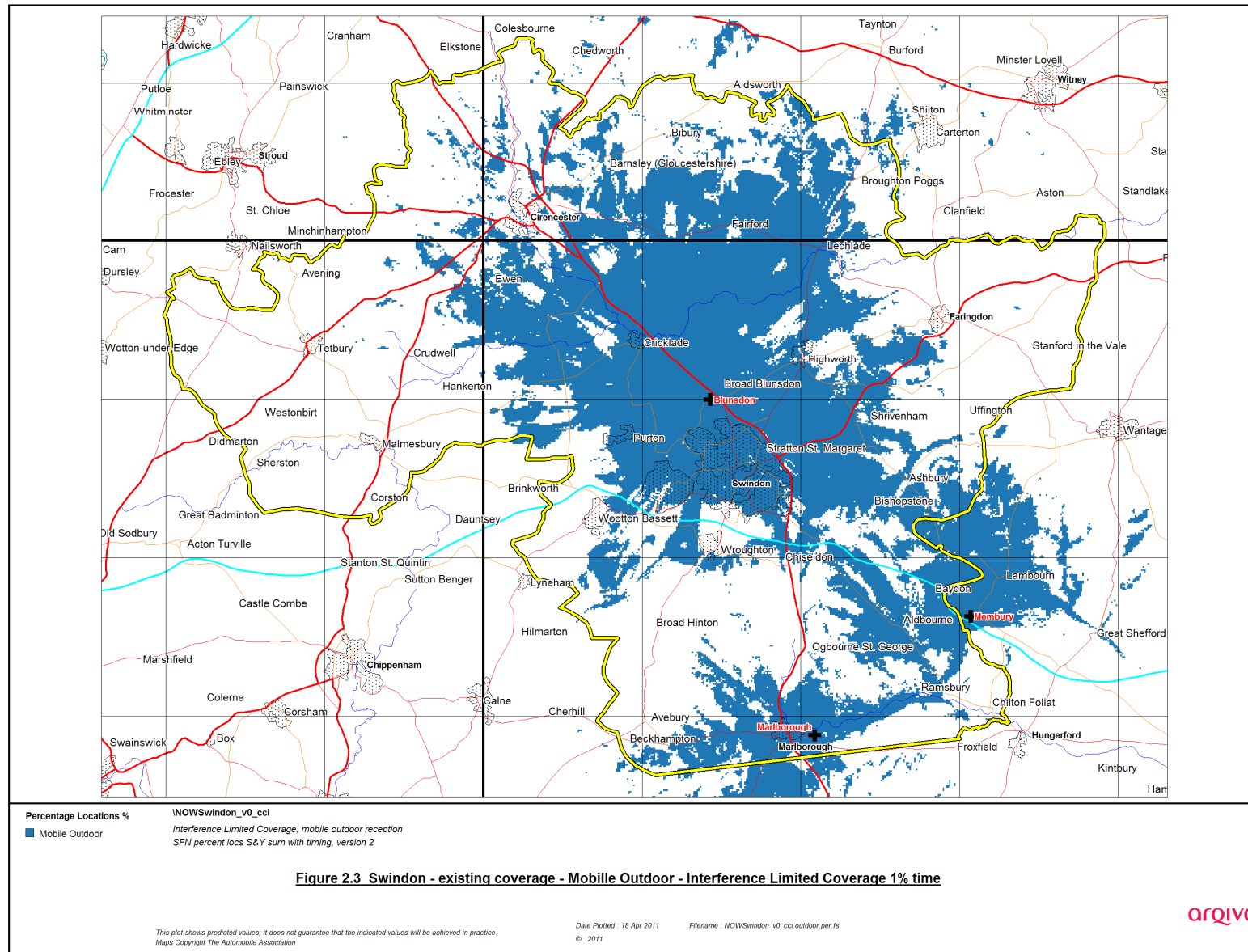
Figure 2.15

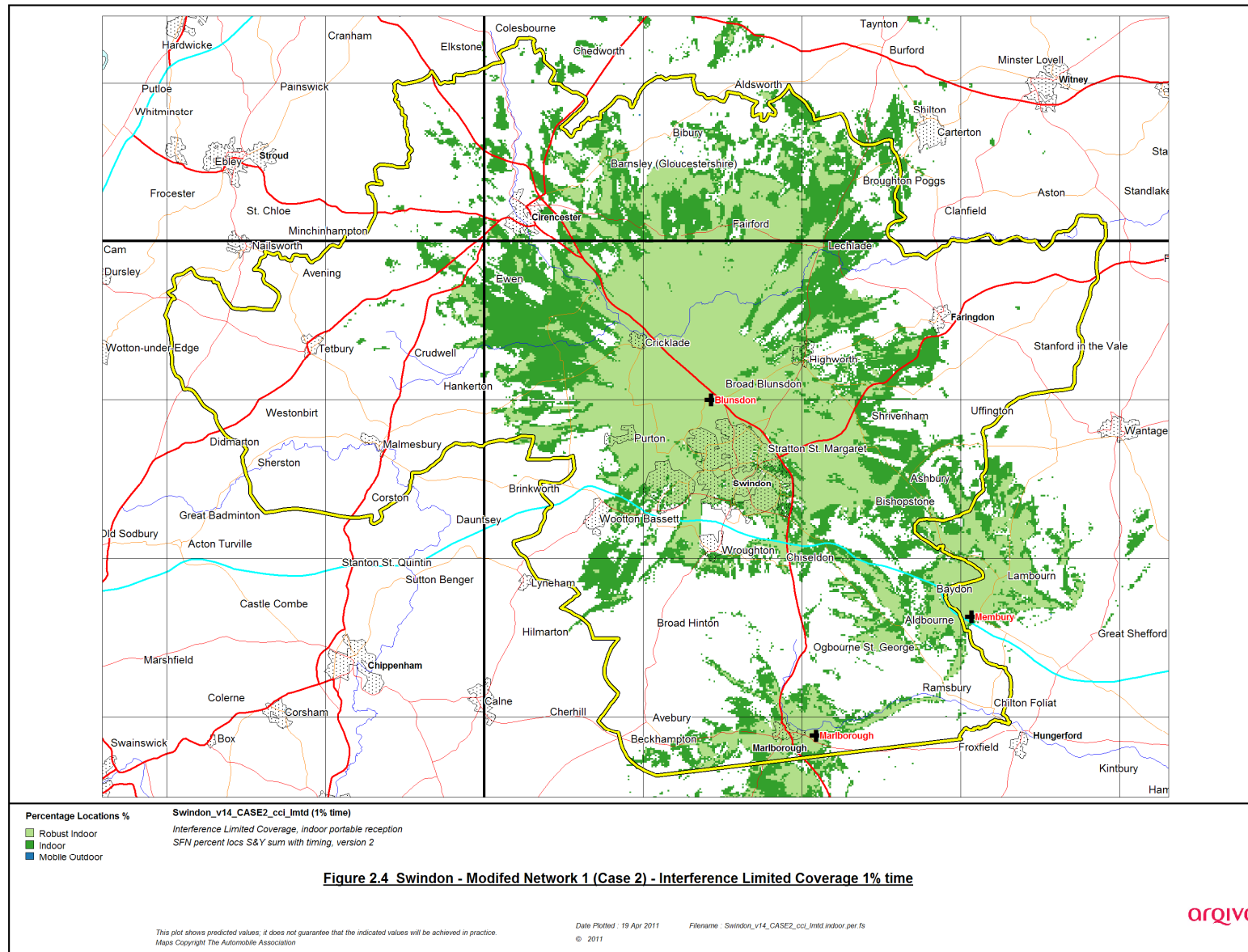
Case 3, Mobile outdoor Coverage interference limited for Swindon - Modified network
2- 50% time (*8 transmitters*)

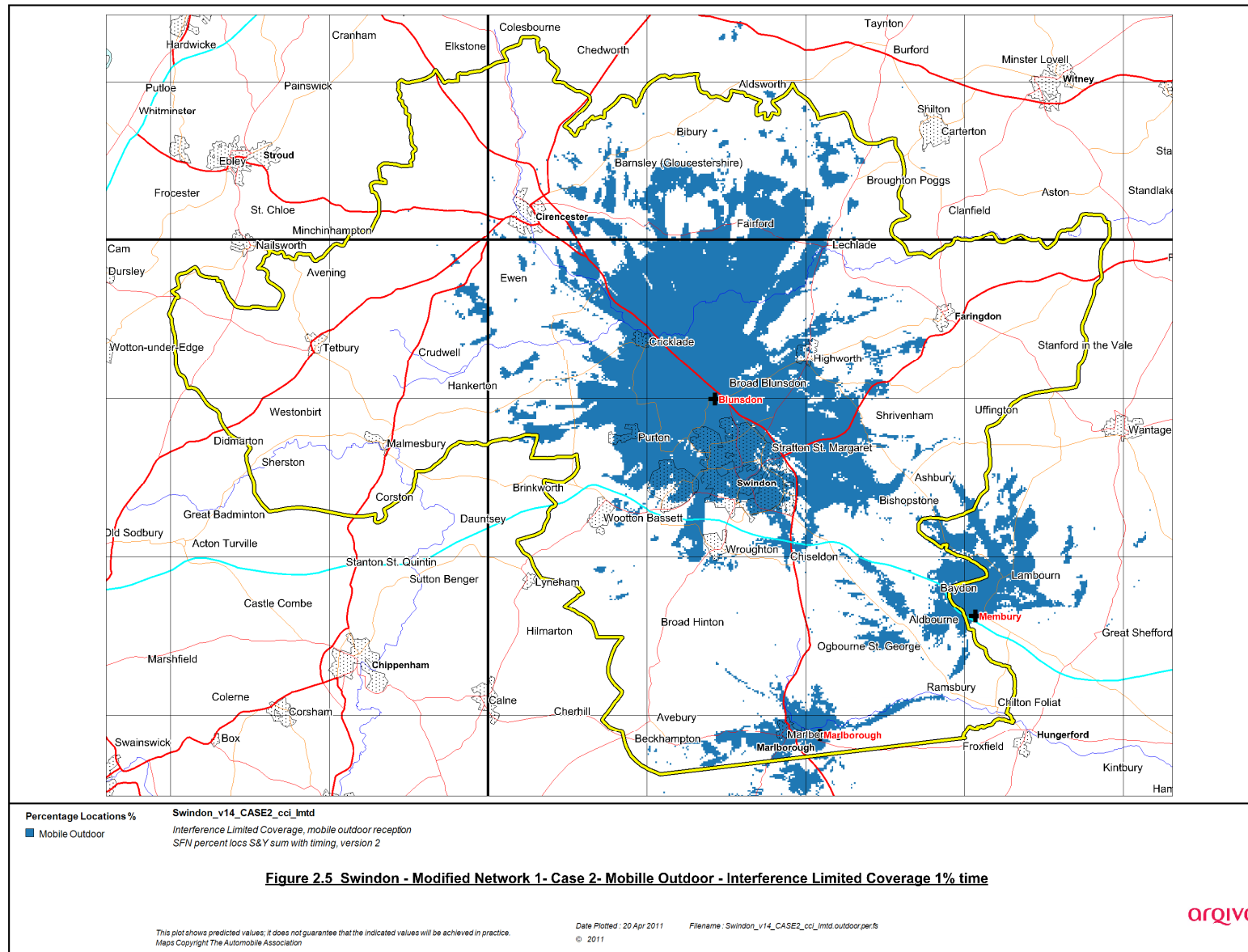
There are no Case 4 maps.

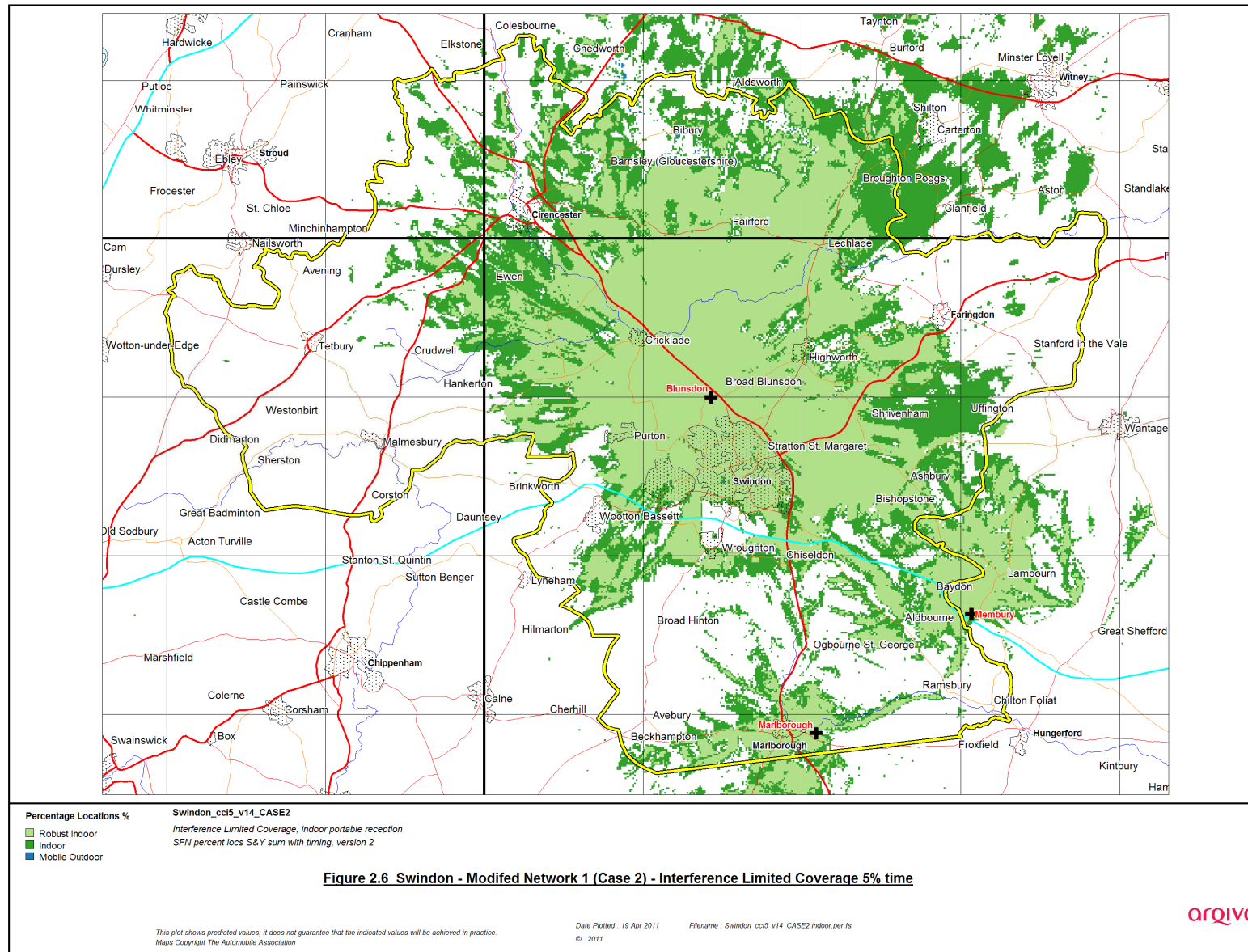


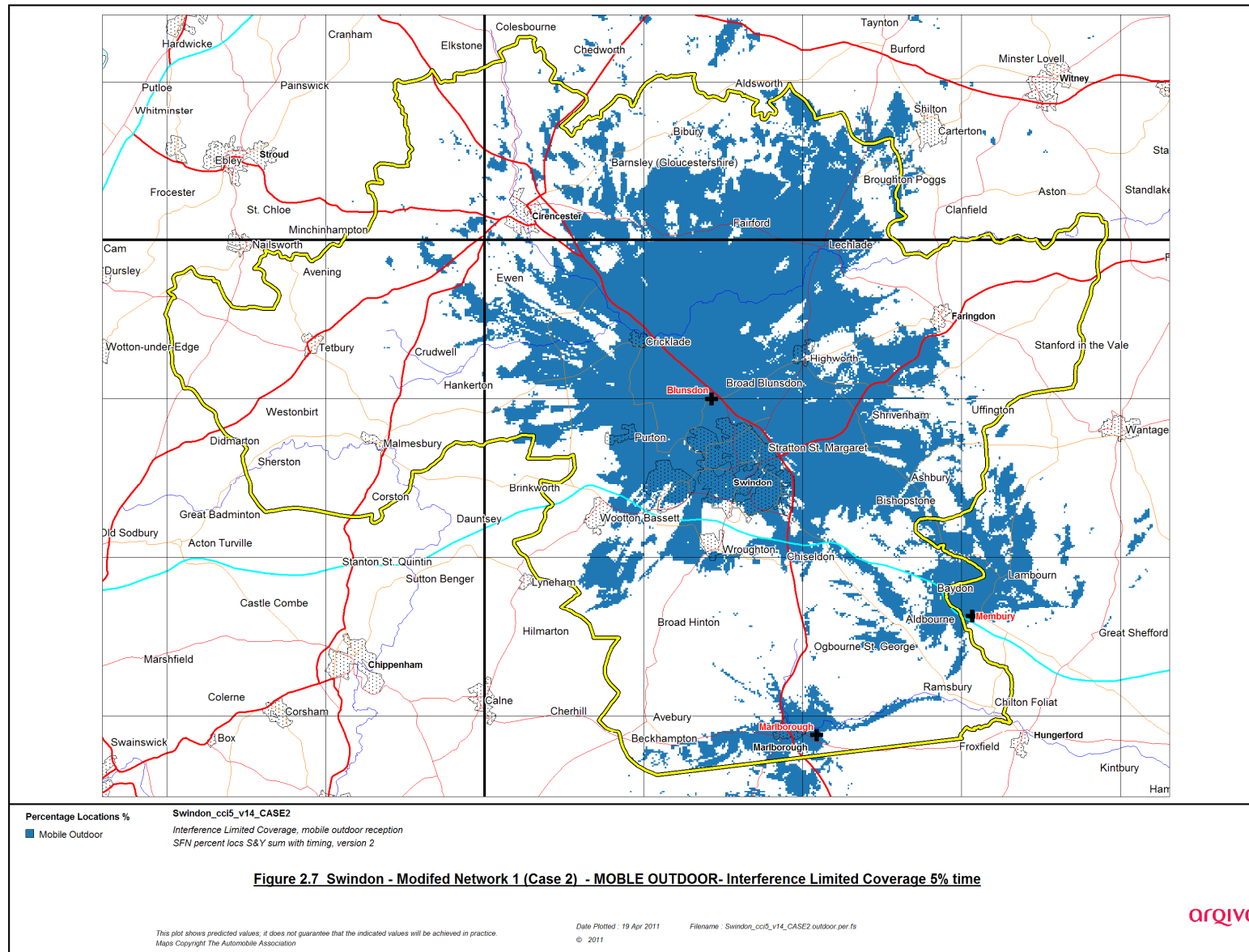


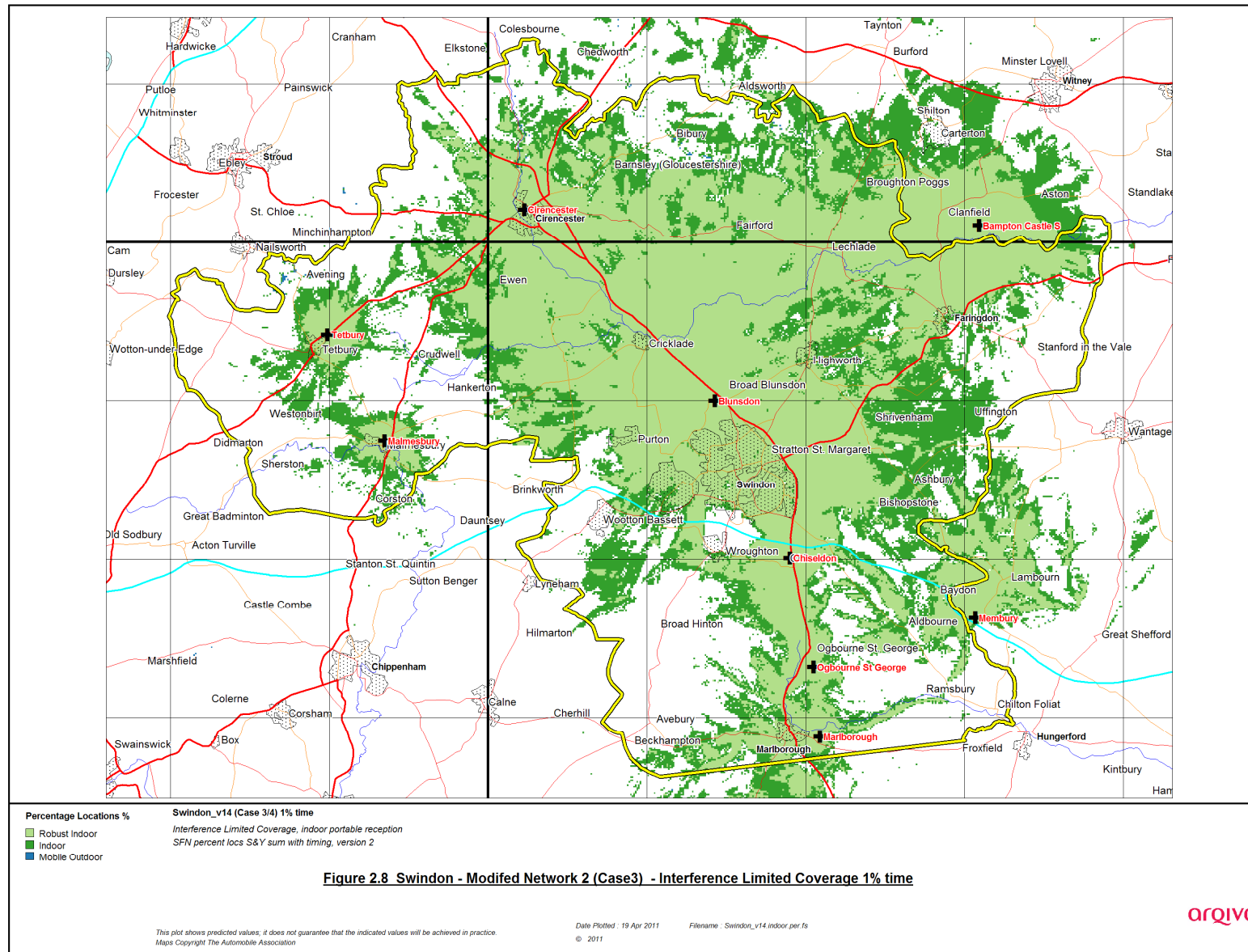


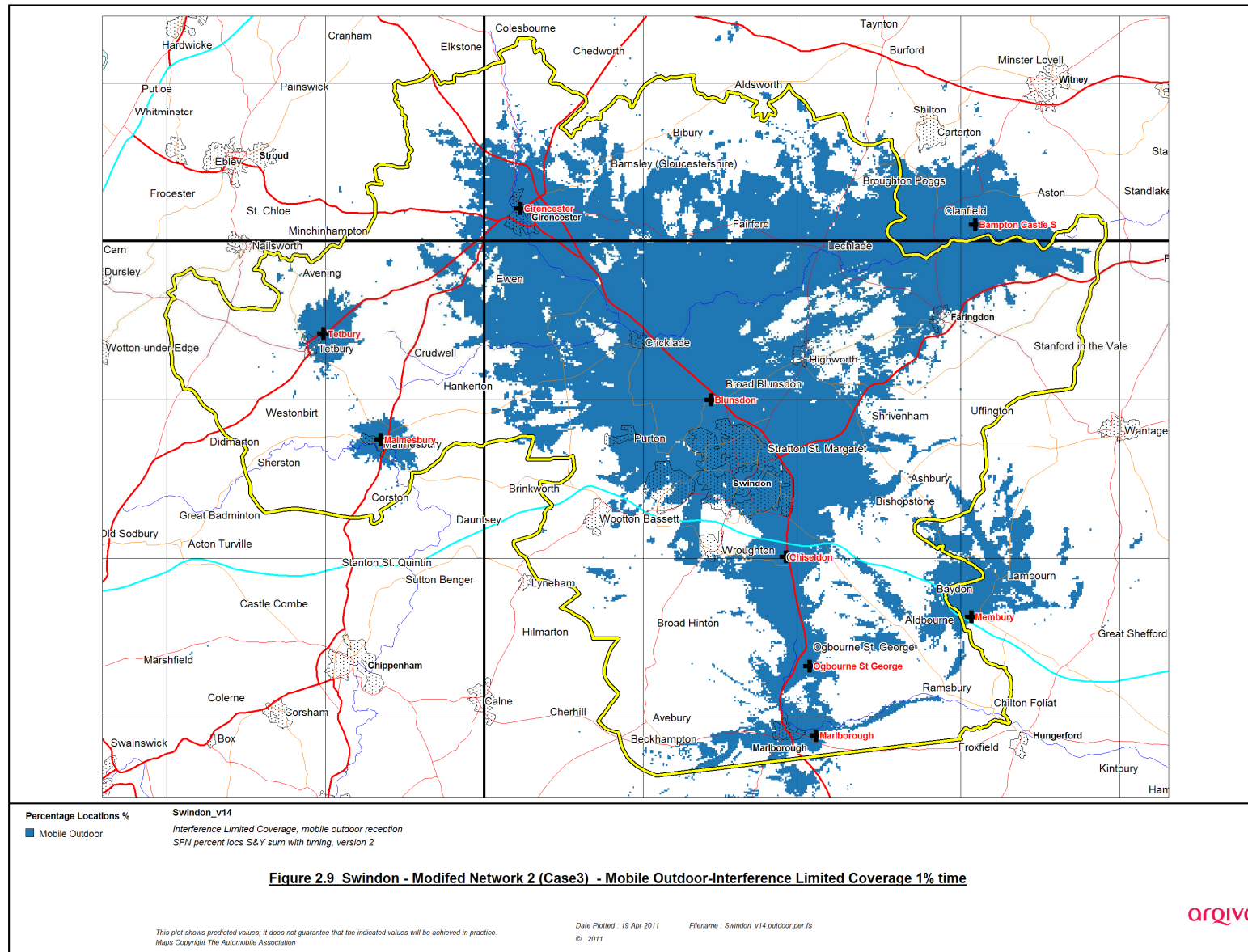


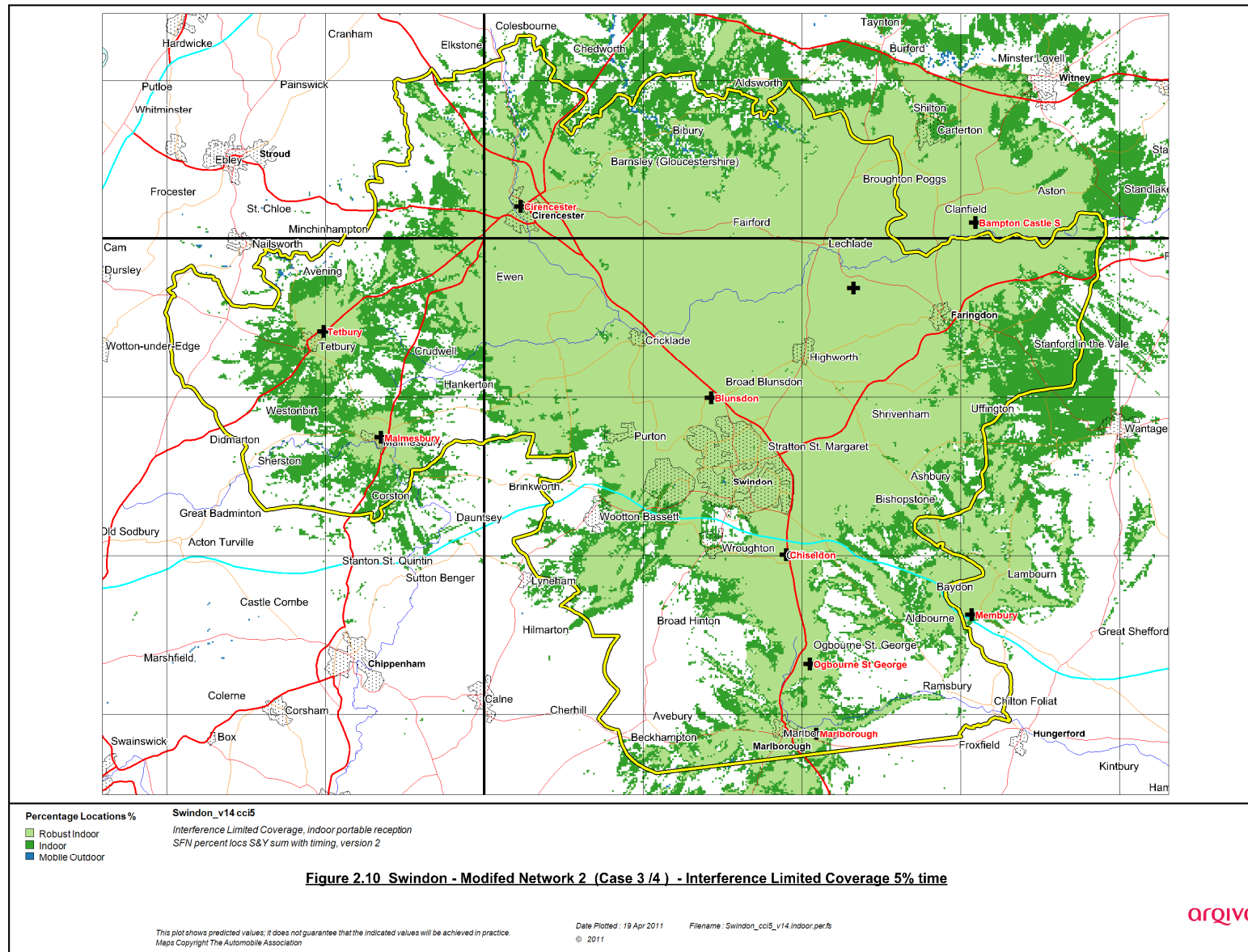


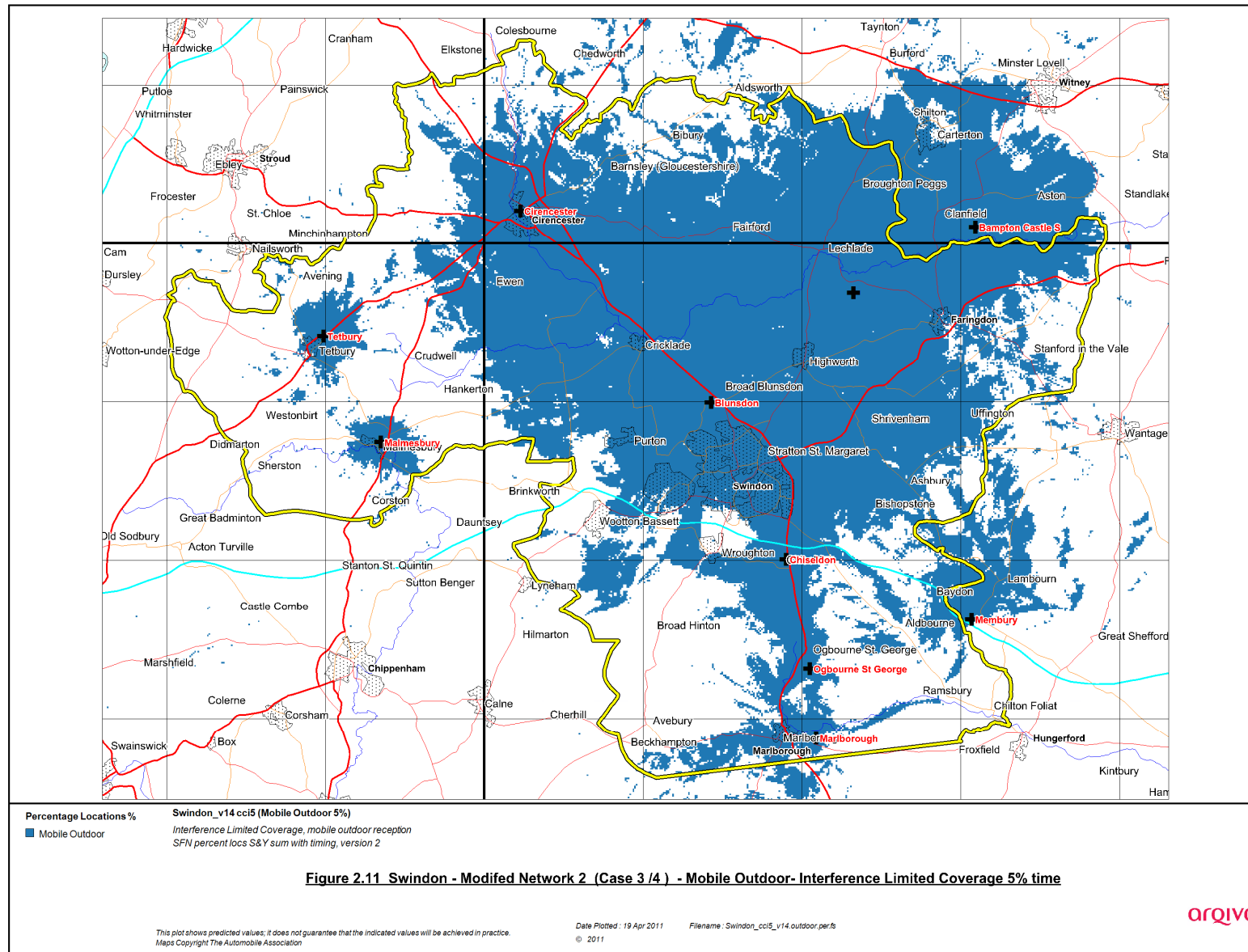


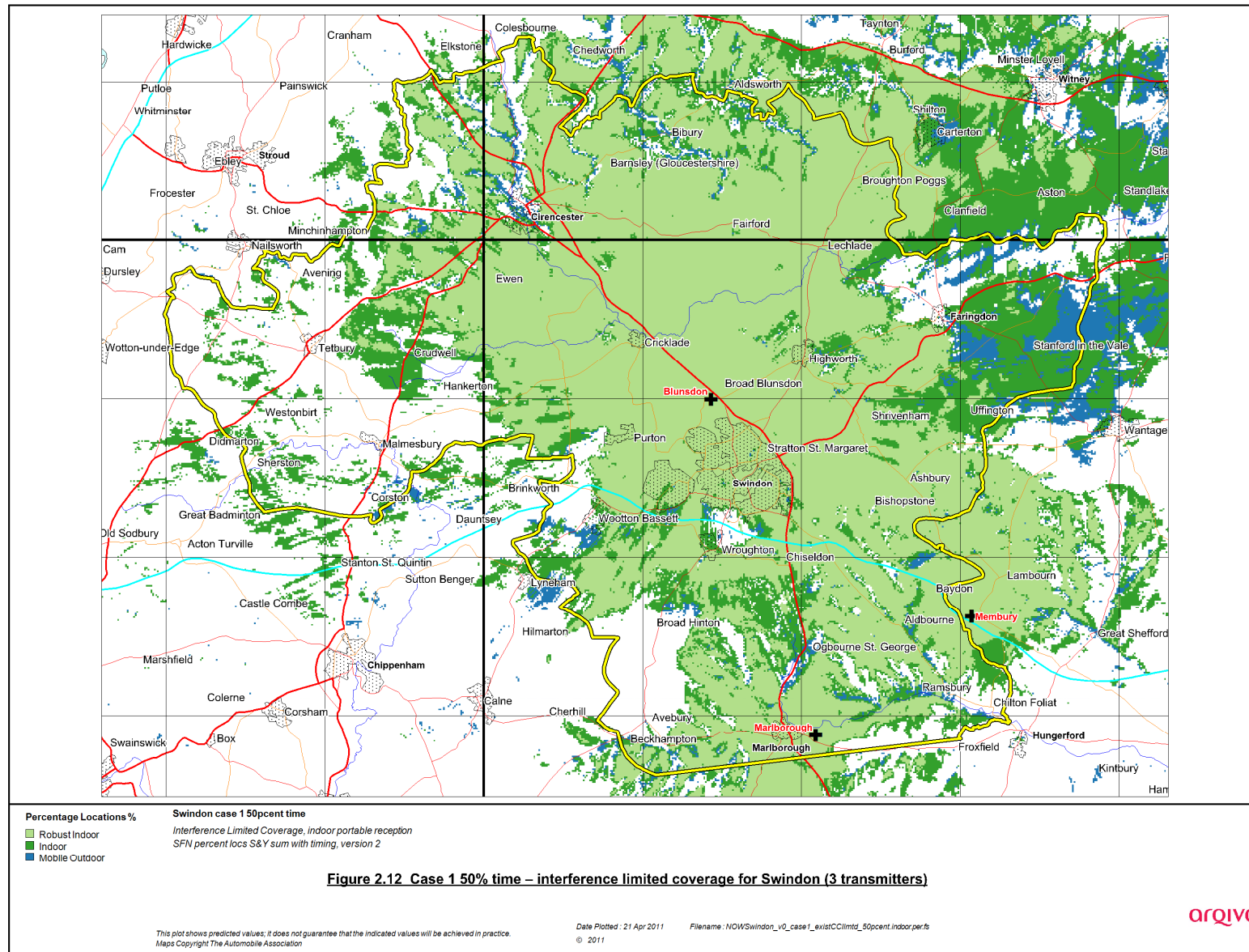


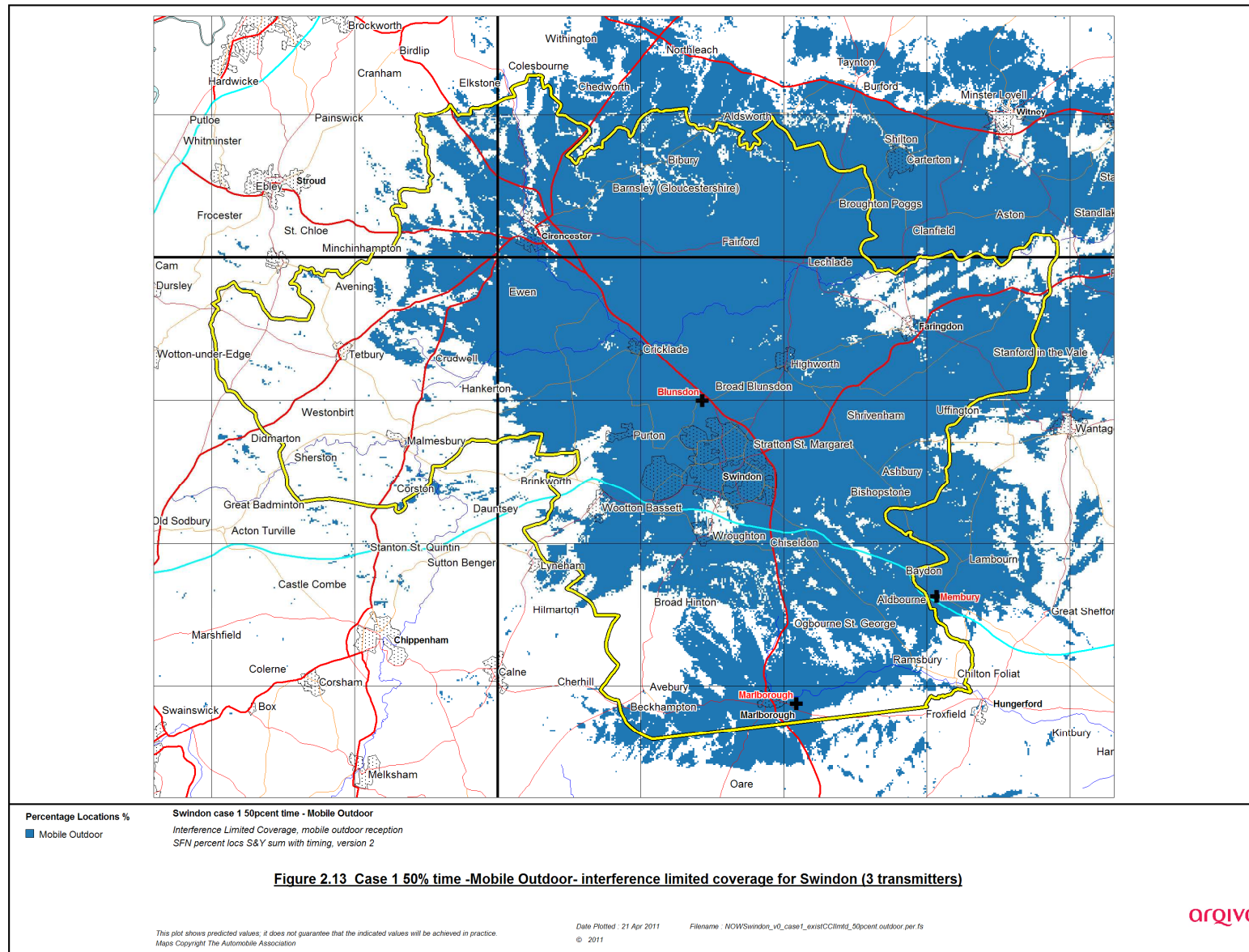


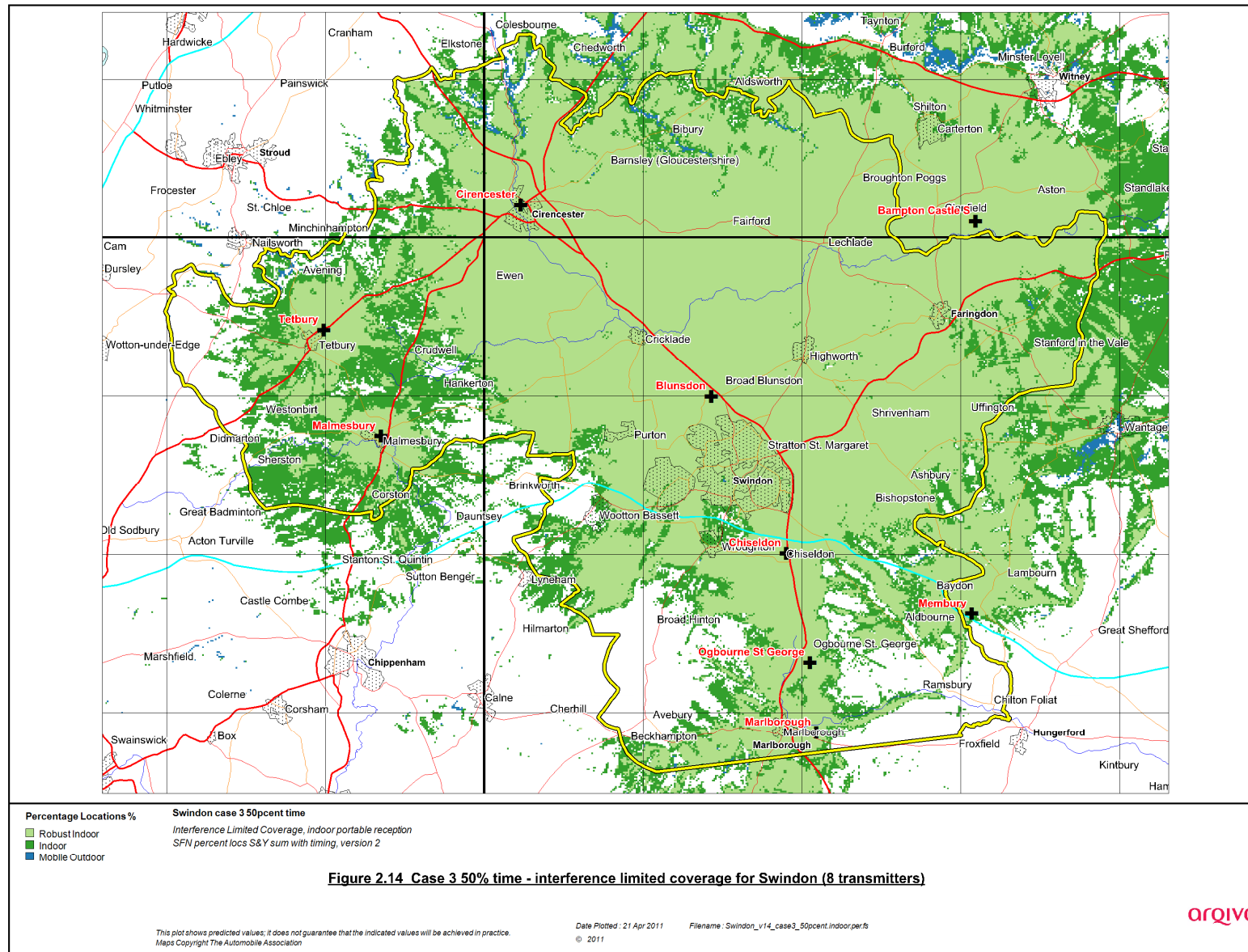


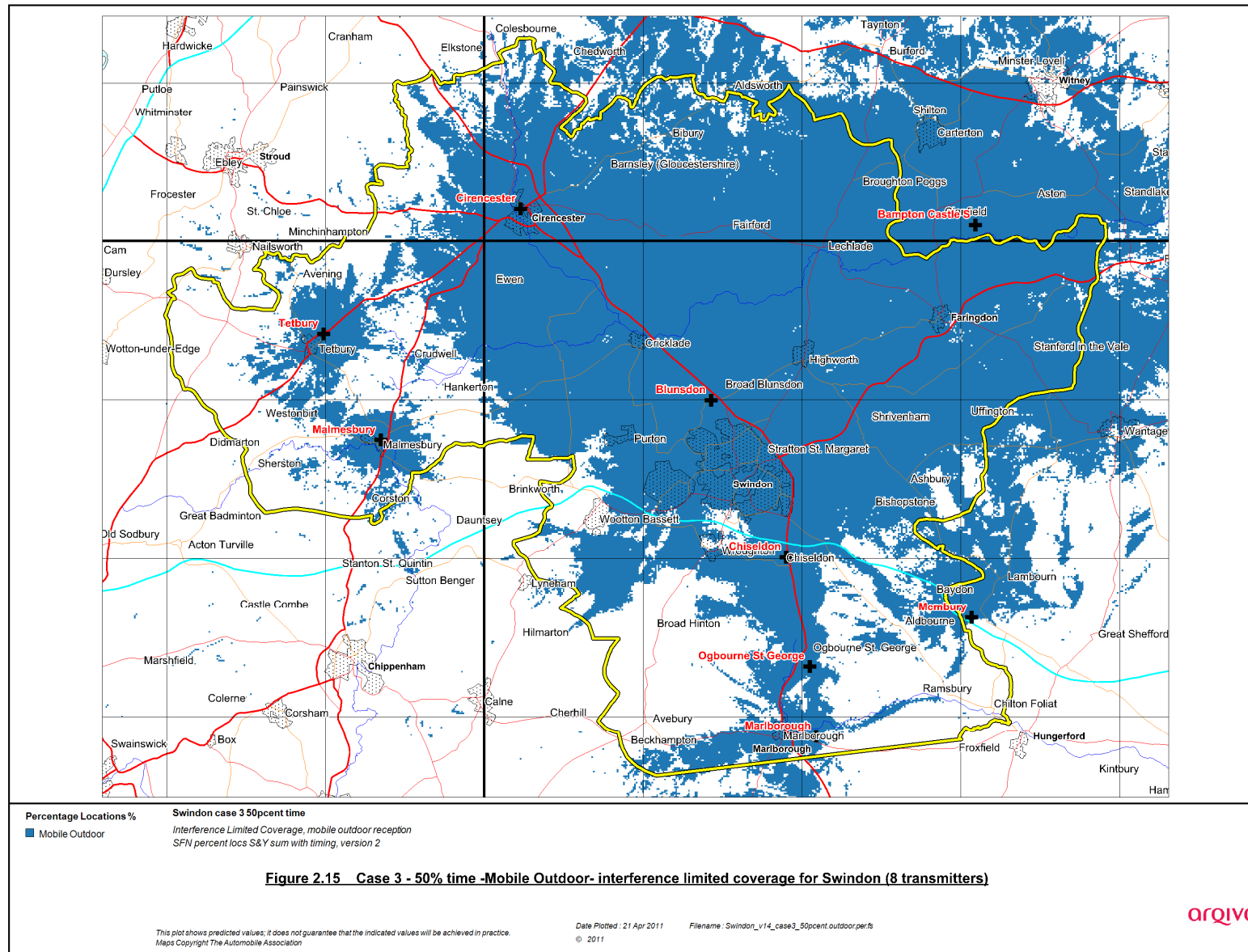












2.2 Population Coverage Tables

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

Existing Swindon

Case 1	Existing Network (<i>3 transmitters</i>) Light Yellow = Existing sites unchanged)
Case 2	Modified Network 1 - (<i>3 transmitters</i>) Lilac
Case 3	Modified Network 2 - (<i>8 transmitters</i>) Lilac + light green = modified network 2
No Case 4	

Table 2-1. Population coverage proportional indoor 99%T Total 143,661

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 (3 Tx)			115249			80.22
Case 2 – Marlborough increase in ERP	Existing DAB sites		98305	-17000	-11.8	68.4
Cirencester	New Site	10905 (7.59%)	109929	1131	0.79%	76.52
Tetbury ST884944	New Site	2643 (1.84%)	112889	2960	2.06%	78.58
Bampton Castle S	New Site	2800 (1.95%)	118245	5356	3.73%	82.31
Malmesbury	New Site	2913 (2.03%)	121534	3290	2.29%	84.60
Chiseldon	New Site	18087 (12.59%)	124986	3451	2.40%	87.00
Ogbourne St George	New Site	430 (0.30%)	125468	482	0.34%	87.34

Table 2-2. Population coverage proportional indoor 95%T Total 143,661

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 (3 Tx)	Existing DAB sites		120438			83.8
Case 2 – Marlborough increase in ERP	Existing DAB sites		107696	-12754	-8.37%	74.97
Cirencester	New Site	12111 (8.43%)	117131	9434	6.57%	81.53
Tetbury ST884944	New Site	2752 (1.92%)	120411	3281	2.28%	83.82
Bampton Castle S	New Site	4484 (3.12%)	125410	4999	3.48%	87.30
Malmesbury	New Site	2986 (2.08%)	129221	3811	2.65%	89.95
Chiseldon	New Site	25573 (17.80%)	131607	2386	1.66%	91.61
Ogbourne St George	New Site	469 (0.33%)	132014	407	0.28%	91.89

Table 2-3 Road coverage 99% locations, 99%T Total 332.5 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 (3 Tx)	Existing sites	171.4			51.57
Case 2 – Marlborough increase in ERP	Existing DAB sites	83.6	-87.8	-26.43	25.15
Cirencester	New Site	121.1	-7.3	-2.19%	36.43
Tetbury ST884944	New Site	126.5	5.3	1.60%	38.03
Bampton Castle S	New Site	151.6	25.1	7.55%	45.58
Malmesbury	New Site	154.8	3.2	0.98%	46.56
Chiseldon	New Site	172.3	17.5	5.25%	51.81
Ogbourne St George	New Site	178.1	5.9	1.76%	53.57

Table 2-4 Road coverage 99% locations, 95%T Total 332.5 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 (3 Tx)	Existing sites	188.9			56.81
Case 2 – Marlborough increase in ERP	Existing DAB sites	121.7	-67.2	-22.11%	36.59
Tetbury ST884944	New Site	169.5	6.5	1.95%	50.98
Bampton Castle S	New Site	192.2	22.7	6.83%	57.80
Malmesbury	New Site	195.8	3.6	1.08%	58.89
Chiseldon	New Site	208.9	13.1	3.95%	62.83
Ogbourne St George	New Site	213.8	4.8	1.45	64.28

Table 2-5. Summary of Coverage within Editorial Area for Each Case – 1% time

Case	Indoor Household (& percentage coverage)	Mobile Road Coverage (& percentage coverage) 99% locations
1	115249 (80.2%)	171.4 (51.6%)
2	98305 (68.4%)	83.6 (25.2%)
3	125468 (87.3)	178.1 (53.57%)
4 (Same as Case 3)	125468 (87.3)	178.1 (53.57%)

- Case 1 - Light Yellow = Existing sites unchanged
Case 2 - Lilac = Modified Network 1
Case 3 - Lilac + light green = modified network 2
Case 4 - No Case 4

Table 2-6. Summary of Coverage within Editorial Area for Each Case – 5 % time

Case	Indoor Household (& percentage coverage)	Mobile Road Coverage (& percentage coverage) 99% locations
1	120438 (83.8%)	188.9 (56.8%)
2	107696 (75%)	121.7 (36.6%)
3	132014 (92%)	213.8 (64.8%)
4 (Same as Case 3)	132014 (92%)	213.8 (64.8%)

Table 2-7. Summary of Coverage within Editorial Area for Case 1 & 3 – 50 % time

Case	Indoor Household (& percentage coverage)	Mobile Road Coverage (& percentage coverage) 99% locations
1	119785 (83.4%)	261.4 (78.6%)
3	136577 (95.1%)	280.7 (84.4%)