
Digital Switchover (DSO) Programme

Radio DSO Block 12D Edinburgh

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Company Confidential

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1 Edinburgh (12D) DSO Narrative

Block 12D assigned to Edinburgh is an existing allocation with five, existing, 'on-air' transmitters' :-

Transmitter	ERP (kW)
Black Hill	0.500
Braid Hill	0.170
Knock Hill	1.500
Craigkelly	1.000
Penicuik	2.500

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

N. Ireland

Leeds

Stoke-on-Trent

West & Mid Wales

Coventry

Reading & Basingstoke

Southend & Chelmsford

Peterborough

Edinburgh

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. By virtue of the terrain and distances between multiplexes, the only 12D multiplexes having any affect upon Edinburgh are N Ireland and Leeds; although even these have very little impact upon Edinburgh (12D). Similarly, Edinburgh (12D) has very little effect upon N Ireland (12D) & Leeds (12D) and almost no impact upon the other distant 12D multiplexes.

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

The proposed Editorial Area of Edinburgh (12D) has changed significantly to that of the existing service; it is proposed to include the (eastern) Border Region within the new Editorial Area. Part of Perthshire, previously covered by Edinburgh (12D), is now within the sole area of Tayside (11B). The two Editorial Areas (existing & proposed) are show Figure 2.1

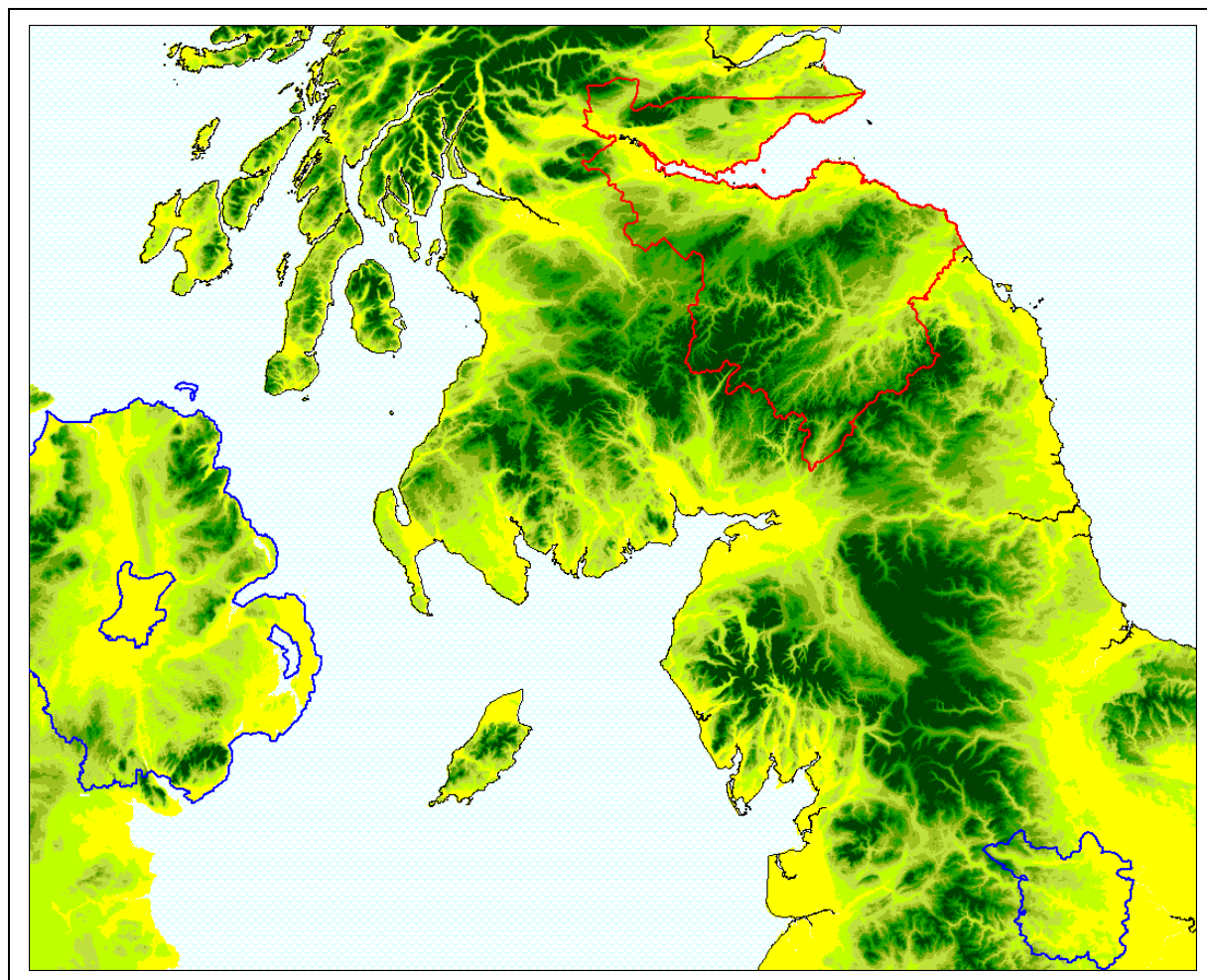


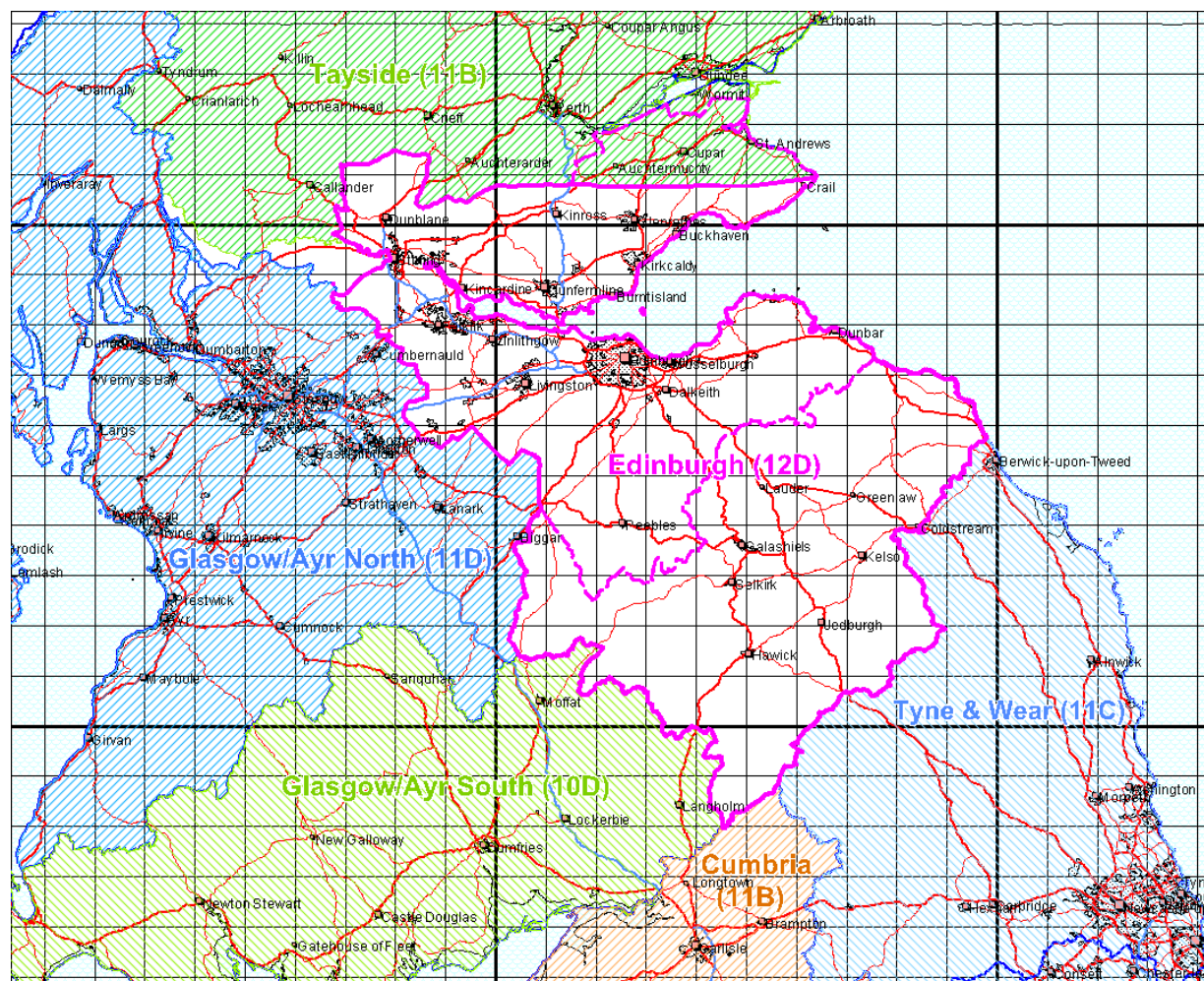
Figure 1.1: Proposed Block 12D Allocations

There are no Editorial Area overlaps with any other local multiplexes. The following five multiplexes about Edinburgh (12D) :-

- Tayside (11B) to north
- Glasgow N (future 11C) to west
- Glasgow S (future 10D) to south-west
- Cumbria (11B) to south
- Tyne & Wear (11C) to south

These are shown on map, Figure 1.2 overleaf :-

FM Radio coverage is currently provided by BBC Radio Scotland (from *Black Hill, Penicuik, Peebles, Innerleithen, and Ashkirk*, transmitters). Independent Radio is provided by Forth 1 (from *Black Hill, Craigkelly and Penicuik*). Considering the mountainous terrain, predictions show the area as relatively well served by these combined FM services; some deep valleys remain poorly served.



Map Copyright: The Automobile Association

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

Solid Purple Contour
Broken Purple Contour

Proposed Editorial Area
Existing Editorial Area

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 five transmitters on-air and these are listed at beginning of *Section 1*. The antenna horizontal radiation patterns (HRP) are overlaid onto these maps. Interference limited coverage includes the nine co-block interferers including West Wilts (12D), although only N Ireland (12D) and Leeds (12D) impact Edinburgh (12D) – and even these have very little affect because of their distance and interposing terrain.

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

The current Edinburgh (12D) coverage is essentially limited by terrain rather co-block interference; it's coverage is reasonable for the original Editorial Area but will require many more transmitters to cover the expanded Editorial Area

For case 2: Modified network 1

It proposed to increase the maximum effective radiated powers (ERP) of Craigkelly to 4kW and, additionally, utilise the more omni-directional antenna in use on this mast for the National BBC & Digital One services.

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 relatively well served by combined FM services; exceptions being some of the deep valleys in the more remote areas.

Thirteen further sites are required to emulate the FM coverage, although it will still not match the predicted FM coverage. Many more cellular-like transmitters will be required to complete coverage in these deep valleys along which many of the smaller roads run. *Figures 2-5 and 2-6* shows the 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).

With 18 transmitters, indoor coverage was predicted to be 96.86% of the Editorial Area (1% Time interference). Outdoor (Road) coverage is 92.75% (1% Time interference).

The plan remains unchanged from that for Case 3 (previous page). Further transmitters may be added for small communities – as is the case with terrestrial TV relays - but in order to complete road coverage within some of the remote valleys, many more transmitters would be required; most likely be of the size and density of cellular phone masts.

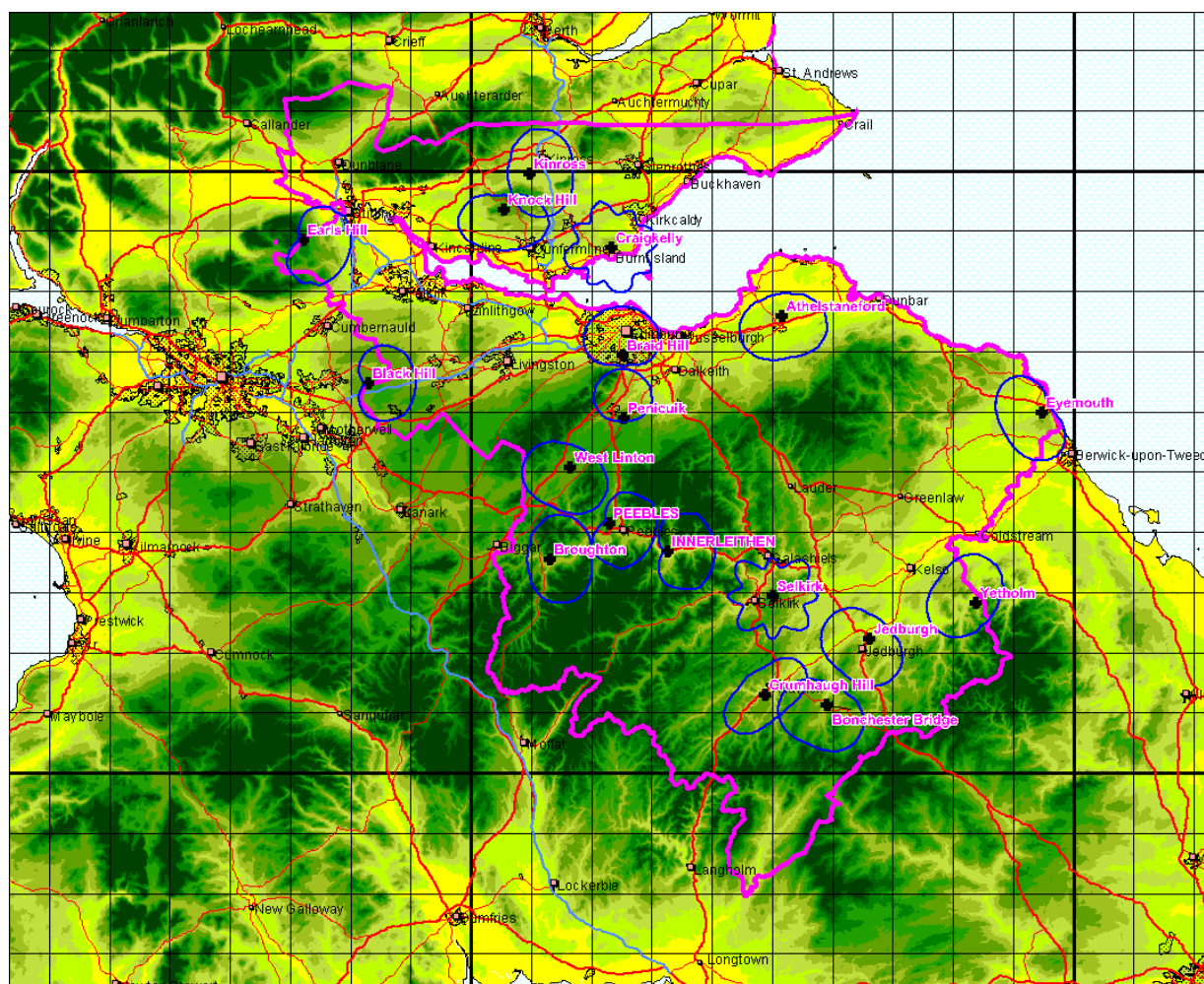
1.1 Incoming interference and sensitivity to other co-block multiplexes

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.

There is no significant co-block interference issues associated with this plan.

1.2 Outgoing interference to other co-block multiplexes

The terrain and remoteness of this multiplex precludes any significant outgoing interference, consequently, there is virtually no impact to other co-block allocations from the proposals contained in this report.



Map Copyright: Ordnance Survey 1: 625,000

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

Solid Purple Contour Editorial Area

Antenna Horizontal Radiation Patterns (HRP) are shown for the 18 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

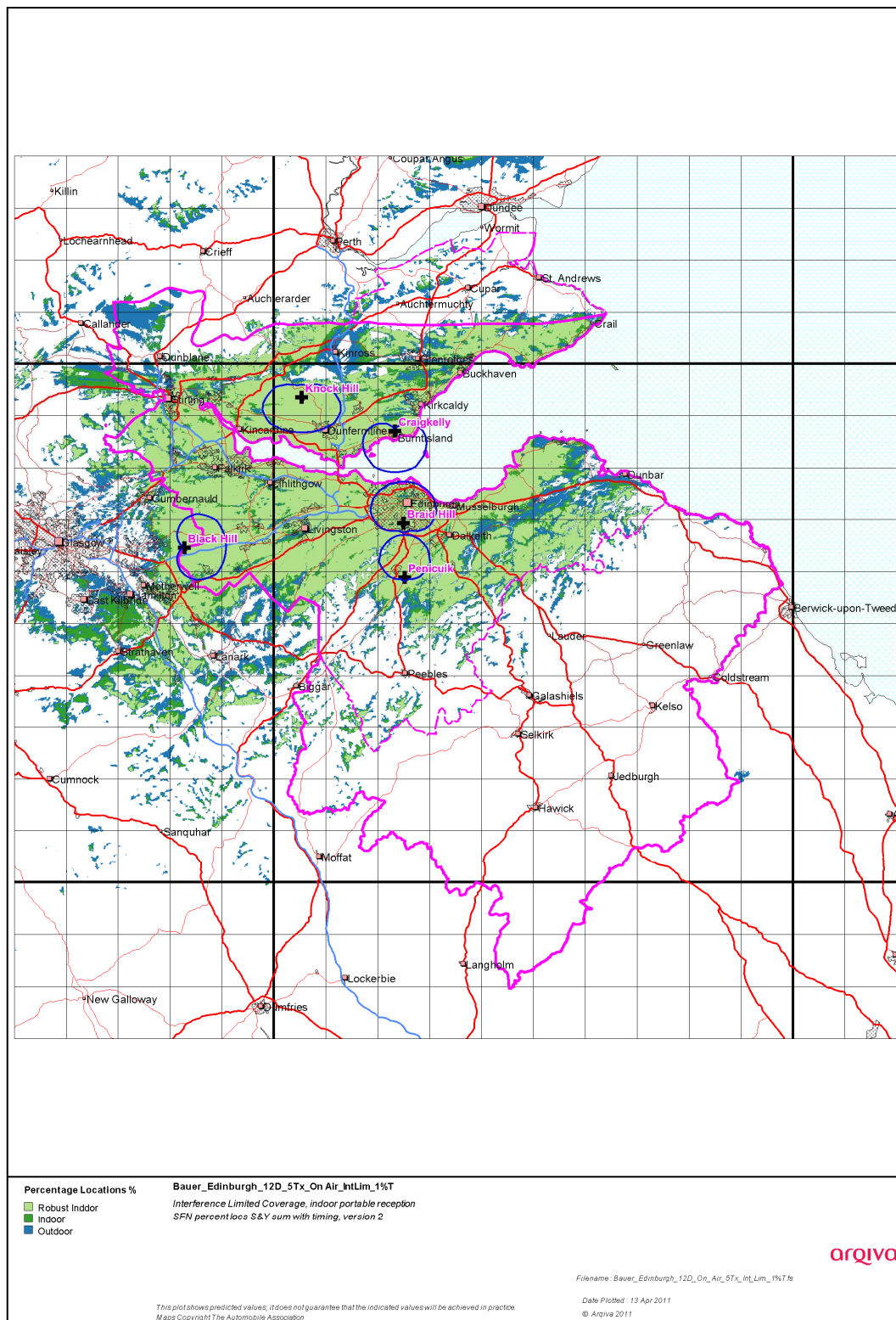


Figure 2-1. Current Situation

Broken Purple Contour shows the Existing Editorial Area

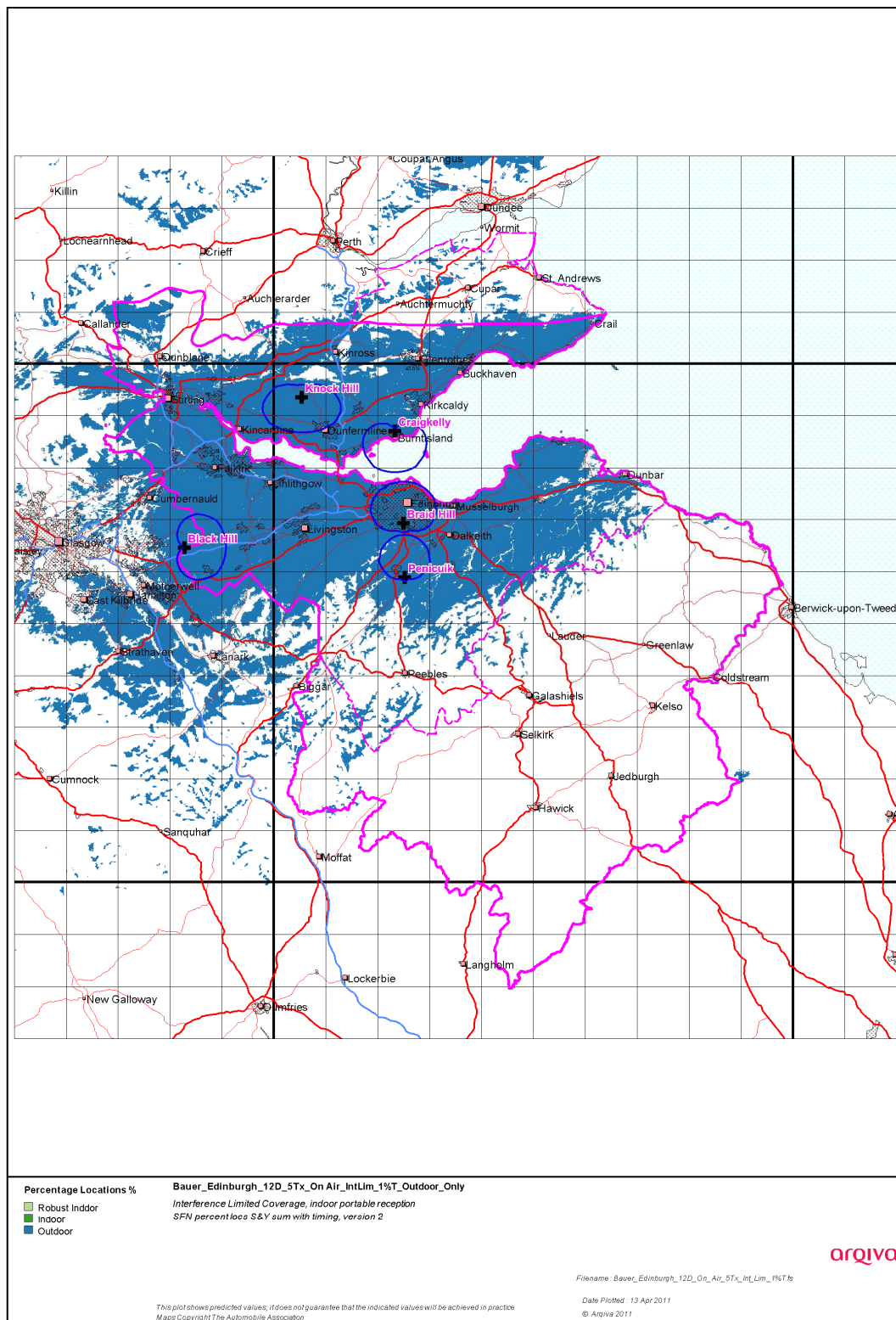


Figure 2-2. Current Situation – Outdoor Only, 1% Time Interference

Broken Purple Contour shows the Existing Editorial Area

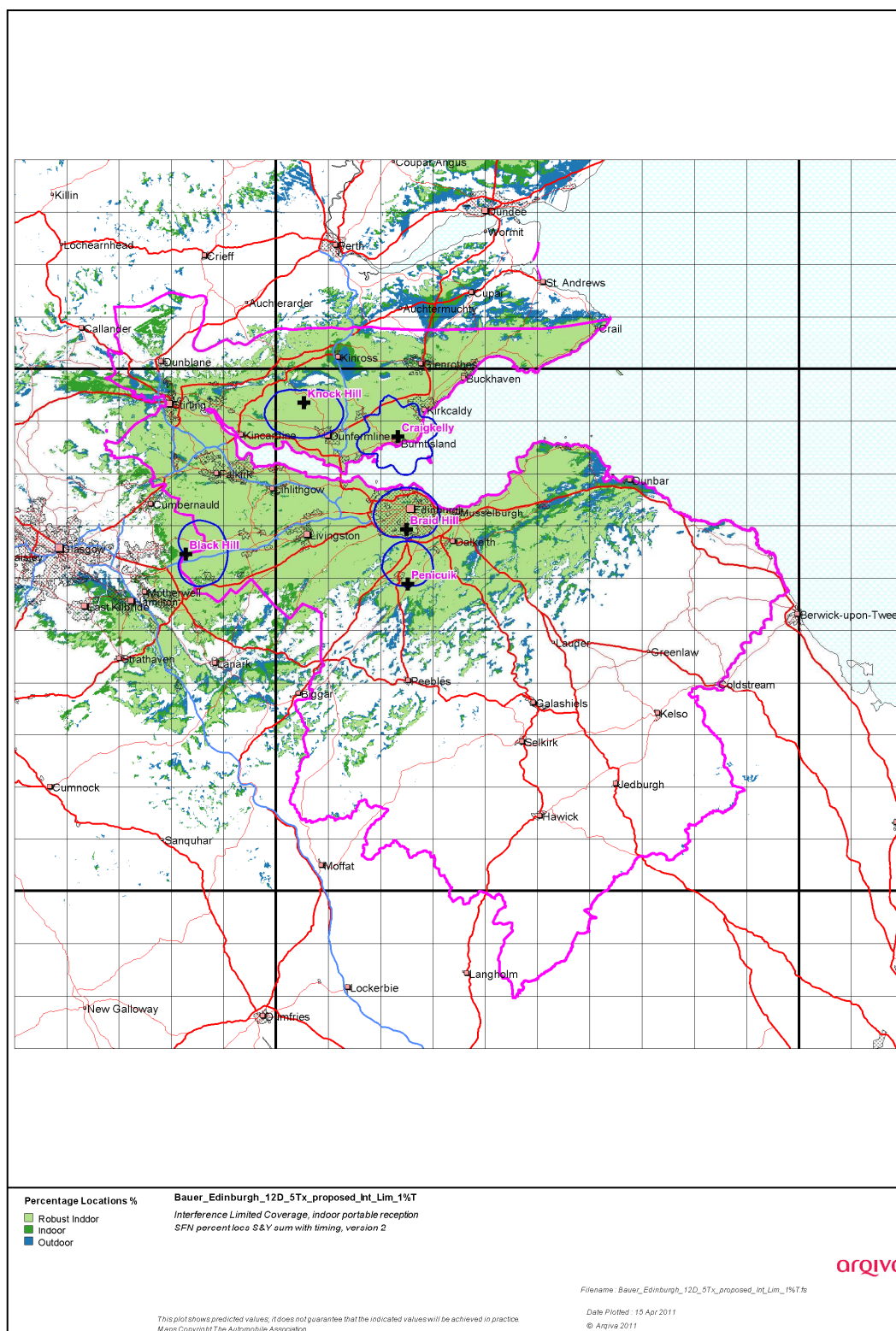


Figure 2-3. Modified Network 1

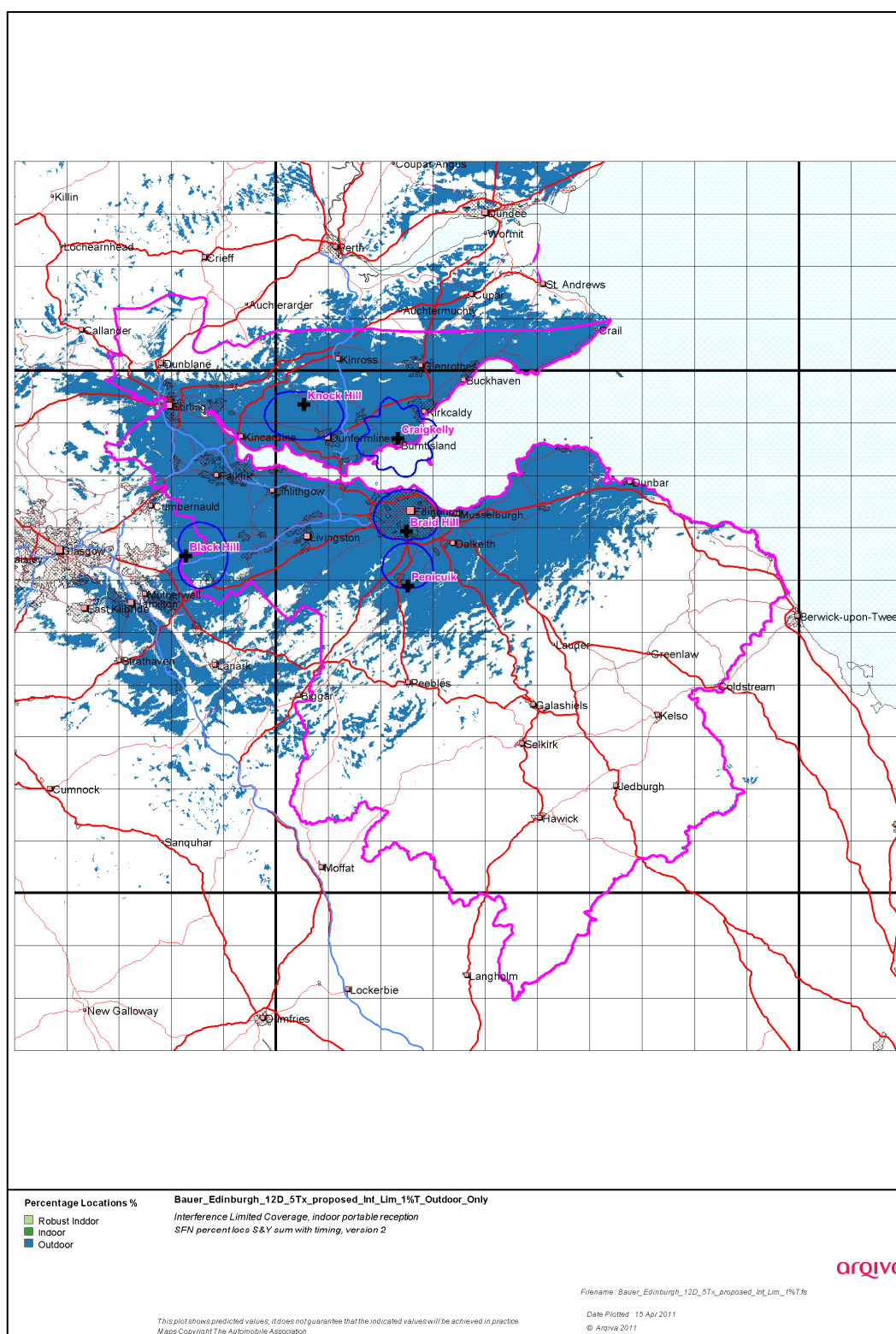


Figure 2-4. Modified Network 1 – Outdoor Only, 1% Time Interference

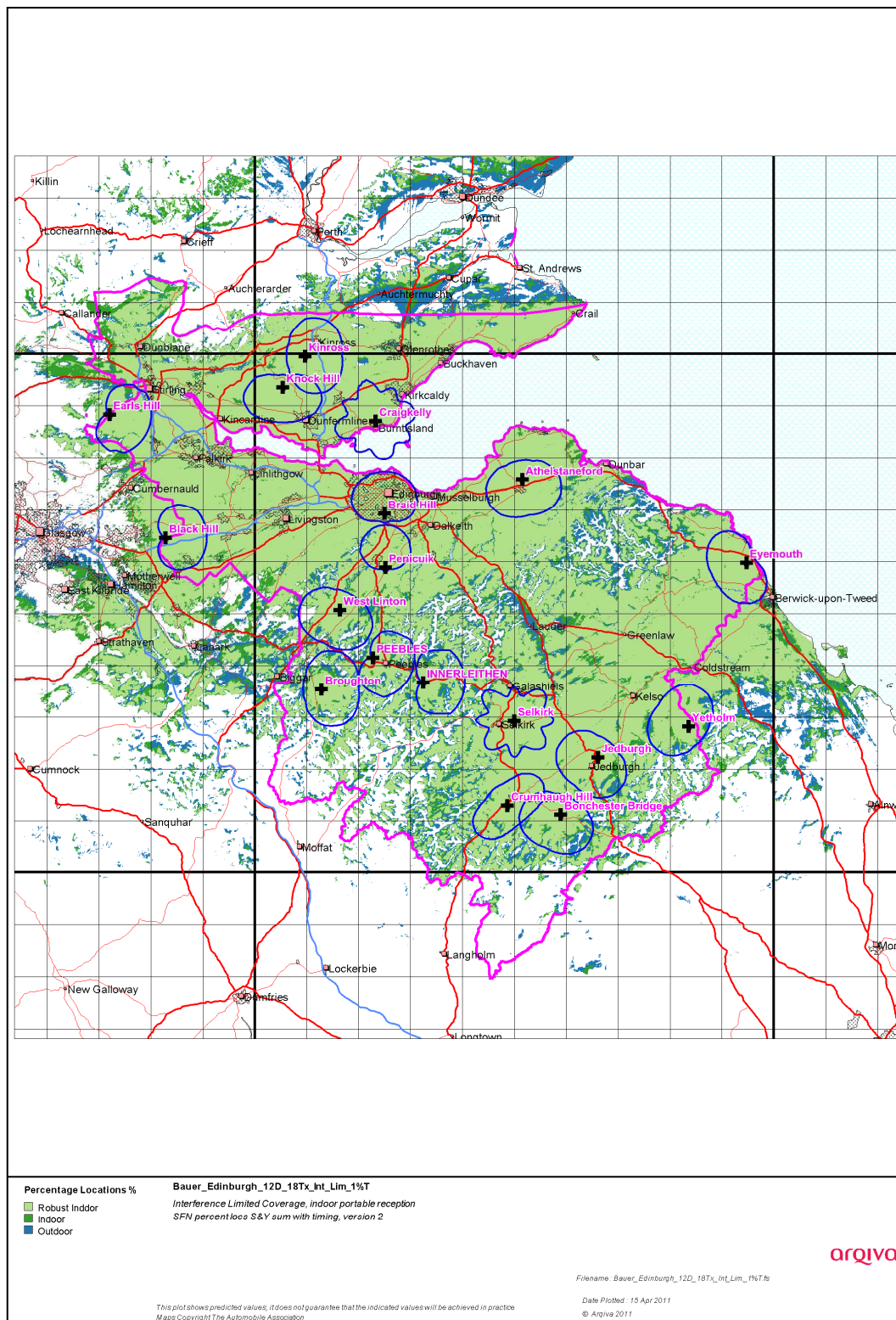


Figure 2-5. Modified Network 2

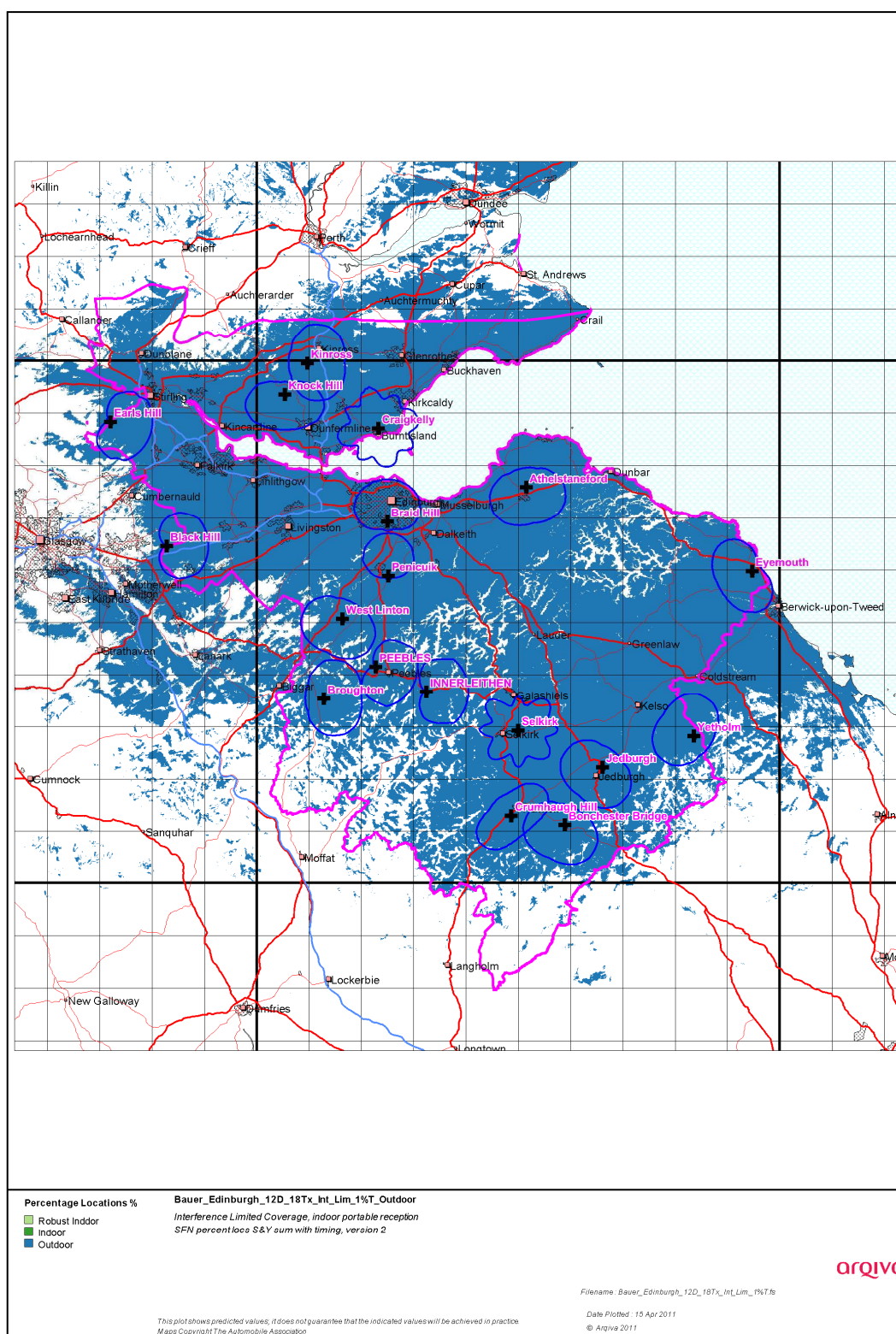


Figure 2-6. Modified Network 2 – Outdoor Only, 1% Time Interference

2.2 Population Coverage tables within Editorial Area

Table 2-1 Population - Proportional Indoor Coverage: Total households 1,906,164

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 (5Tx)	Existing	-	568,756	-	-	77.24
Current (5Tx)	Existing	-	637,148	68,392	9.29	86.53
Selkirk	New, Existing Infrastructure	25,692 (3.49%)	663,766	26,618	3.62	90.15
Earls Hill	New, Existing Infrastructure	104,909 (14.25%)	676,876	13,110	1.78	91.93
Athelstaneford	New, Existing Infrastructure	76,249 (10.36%)	686,705	9,829	1.33	93.26
Crumhaugh Hill	New, Existing Infrastructure	8,727 (1.19%)	693,327	6,622	0.90	94.16
Eyemouth	New, Existing Infrastructure	7,675 (1.04%)	699,915	6,588	0.90	95.06
Peebles	New	4,618 (0.63%)	704,555	4,640	0.63	95.69
Kinross	New	7,561 (1.03%)	705,796	1,241	0.16	95.85
Jedburgh	New	3,227 (0.44%)	708,081	2,285	0.31	96.16
Innerleithen	New	2,113 (0.29%)	710,312	2,231	0.31	96.47
West Linton	New	1,320 (0.18%)	711,500	1,188	0.16	96.63
Yetholm	New	3,358 (0.46%)	712,725	1,225	0.16	96.79
Broughton	New	303 (0.04%)	713,022	297	0.05	96.84
Bonchester Bridge	New	218 (0.03%)	713,221	199	0.02	96.86

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 1,906 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 (5Tx)	Existing	1,210.0	-	-	63.48
Current (5Tx)	Existing	1,237.2	27.2	1.43	64.91
Selkirk	New, Existing Infrastructure	1,562.8	325.6	17.1	82.0
Earls Hill	New, Existing Infrastructure	1,588.5	25.7	1.3	83.3
Athelstaneford	New, Existing Infrastructure	1,594.0	5.5	0.3	83.6
Crumhaugh Hill	New, Existing Infrastructure	1,615.9	21.9	1.2	84.8
Eyemouth	New, Existing Infrastructure	1,669.3	53.4	2.8	87.6
Peebles	New	1,697.0	27.7	1.4	89.0
Kinross	New	1,697.7	0.7	0.1	89.1
Jedburgh	New	1,708.1	10.4	0.5	89.6
Innerleithen	New	1,720.7	12.6	0.7	90.3
West Linton	New	1,751.4	30.7	1.6	91.9
Yetholm	New	1,754.9	3.5	0.2	92.1
Broughton	New	1,766.3	11.4	0.6	92.7
Bonchester Bridge	New	1,767.9	1.6	0	92.7

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 Edinburgh (12D) Editorial Area for each case

Case	Indoor Households & (percentage coverage) <i>Proportional & 99% Time Interference Protection</i>	Mobile Coverage km & (percentage coverage) <i>99% Locations & 99% Time Interference Protection</i>
1	568,756 (77.24%)	1,210 (63.48%)
2	637,148 (86.53%)	1,237.2 (64.91%)
3	713,221 (96.86%)	1,767.9 (92.7%)
4	713,221 (96.86%)	1,767.9 (92.7%)

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