

An STV scheme for Westminster

Denis Mollison, February 2023

This paper presents a specific scheme for implementing STV for the UK parliament, using constituencies based on Local Authority areas, each (with a few exceptions) electing 3-6 MPs.

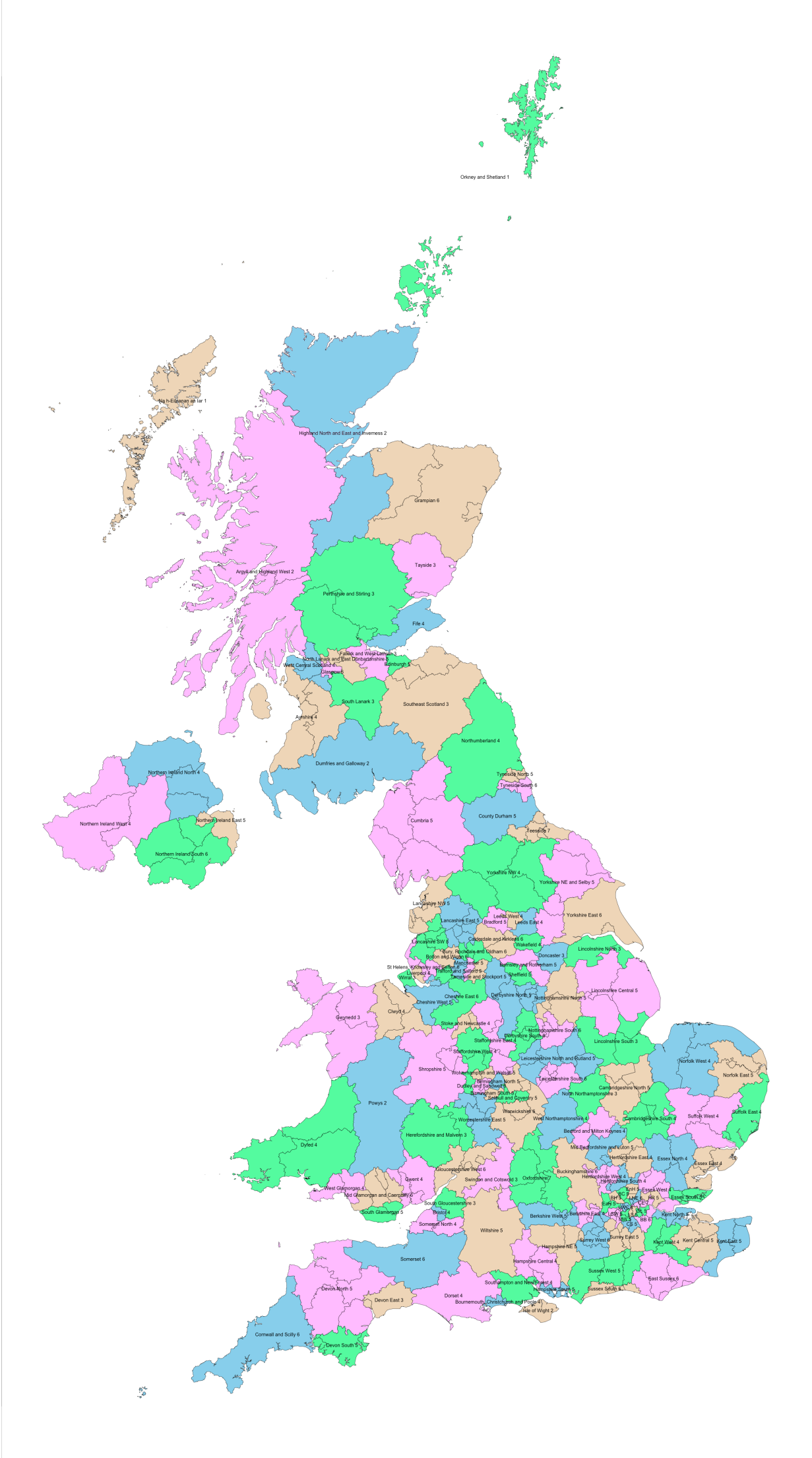
This scheme has the well-known advantages of STV, including:

- It scores highly on all the main good system criteria of fair results, voter power and choice, local representation, and ease of use.
- In particular, it avoids the problems of safe seats, wasted votes, and thus the incentives for tactical voting, which significantly affect alternative proportional representation systems, and make them vulnerable to public and media criticism.
- Votes that would otherwise be wasted can be transferred, thus encouraging more collaboration between parties.

Additionally, basing constituencies on local government areas has advantages of identity and clarity of responsibility for both voter and MP. Boundaries will only rarely need changing, as demographic changes can normally be allowed for by changing the number of MPs rather than the boundaries.

A major advantage of this scheme is that the seat allocation can be updated very simply whenever the electoral roll is updated. Drawing boundaries to fit communities inevitably means that parity (the number of voters per MP) will vary significantly at the local level (by on average around $\pm 6\%$). However the likely effect at the national level, crucially on whether or not a potential government has a majority, can be shown to be well under 1%. This is significantly less than the political bias that can arise when an initially more equal seat allocation is only revised once every 10 years or more, as happens with a traditional boundary revision process.

[More details on methodology are given in a technical appendix at the end of this paper.]



SCHEDULE OF CONSTITUENCIES

ENGLAND (533 seats)

NORTH EAST (27 SEATS)

1 Northumberland

electorate 248062, seats 4

LAs: Northumberland

2 Tyneside North

electorate 343966, seats 5

LAs: Newcastle upon Tyne; North Tyneside

3 Tyneside South

electorate 463667, seats 6

LAs: Gateshead; South Tyneside; Sunderland

4 County Durham

electorate 388779, seats 5

LAs: County Durham

5 Teesside

electorate 490611, seats 7

LAs: Darlington; Hartlepool; Middlesbrough; Redcar and Cleveland; Stockton-on-Tees

NORTH WEST (73 SEATS)

6 Cumbria

electorate 386052, seats 5

LAs: Allerdale; Barrow-in-Furness; Carlisle; Copeland; Eden; South Lakeland

7 Lancashire NW

electorate 359783, seats 5

LAs: Blackpool; Fylde; Lancaster; Wyre

8 Lancashire SW

electorate 352961, seats 5

LAs: Chorley; Preston; South Ribble; West Lancashire

9 Lancashire East

electorate 389125, seats 5

LAs: Blackburn with Darwen; Burnley; Hyndburn; Pendle; Ribble Valley; Rossendale

10 Bury, Rochdale and Oldham

electorate 461828, seats 6

LAs: Bury; Oldham; Rochdale

11 Tameside and Stockport

electorate 386172, seats 5

LAs: Stockport; Tameside

12 Manchester

electorate 349726, seats 5

LAs: Manchester

13 Trafford and Salford

electorate 341258, seats 5

LAs: Salford; Trafford

14 Bolton and Wigan

electorate 435405, seats 6

LAs: Bolton; Wigan

15 St Helens, Knowsley and Sefton

electorate 469910, seats 7

LAs: Knowsley; Sefton; St. Helens

16 Liverpool

electorate 322441, seats 5

LAs: Liverpool

17 Wirral

electorate 240866, seats 3

LAs: Wirral

18 Cheshire West

electorate 362639, seats 5

LAs: Cheshire West and Chester; Halton

19 Cheshire East

electorate 456175, seats 6

LAs: Cheshire East; Warrington

YORKSHIRE AND THE HUMBER (54 SEATS)

20 Yorkshire NW

electorate 277046, seats 4

LAs: Craven; Hambleton; Harrogate; Richmondshire

21 Yorkshire NE and Selby

electorate 340980, seats 5

LAs: Ryedale; Scarborough; Selby; York

22 Yorkshire East

electorate 442571, seats 6

LAs: East Riding of Yorkshire; Kingston upon Hull, City of

23 Leeds West

electorate 268981, seats 4

LAs: the parts of Leeds in the current single-member constituencies of Leeds NE, Leeds NW, Leeds W and Pudsey

24 Leeds East
electorate 293796, seats 4
LAs: the parts of Leeds not in Leeds West

25 Bradford
electorate 358903, seats 5
LAs: Bradford

26 Calderdale and Kirklees
electorate 456875, seats 6
LAs: Calderdale; Kirklees

27 Wakefield
electorate 252412, seats 4
LAs: Wakefield

28 Sheffield
electorate 393974, seats 5
LAs: Sheffield

29 Barnsley and Rotherham
electorate 372136, seats 5
LAs: Barnsley; Rotherham

30 Doncaster
electorate 216359, seats 3
LAs: Doncaster

31 Lincolnshire North
electorate 238961, seats 3
LAs: North East Lincolnshire; North Lincolnshire

WEST MIDLANDS (57 SEATS)

32 Stoke and Newcastle
electorate 261253, seats 4
LAs: Newcastle-under-Lyme; Stoke-on-Trent

33 Staffordshire East
electorate 301824, seats 4
LAs: East Staffordshire; Lichfield;
Staffordshire Moorlands; Tamworth

34 Staffordshire West
electorate 262745, seats 4
LAs: Cannock Chase; South Staffordshire;
Stafford

35 Shropshire
electorate 370861, seats 5
LAs: Shropshire; Telford and Wrekin

36 Herefordshire and Malvern
electorate 202079, seats 3
LAs: Herefordshire, County of; Malvern Hills

37 Worcestershire East
electorate 383812, seats 5
LAs: Bromsgrove; Redditch; Worcester;
Wychavon; Wyre Forest

38 Dudley and Sandwell
electorate 454969, seats 6
LAs: Dudley; Sandwell

39 Wolverhampton and Walsall
electorate 366535, seats 5
LAs: Walsall; Wolverhampton

40 Birmingham North
electorate 353590, seats 5
LAs: the parts of Birmingham in the current
single-member constituencies of Birmingham
Erdington, Birmingham Hodge Hill,
Birmingham Ladywood, Birmingham Perry
Barr and Sutton Coldfield

41 Birmingham South
electorate 362670, seats 5
LAs: the parts of Birmingham not in
Birmingham North

42 Solihull and Coventry
electorate 374562, seats 5
LAs: Coventry; Solihull

43 Warwickshire
electorate 425143, seats 6
LAs: North Warwickshire; Nuneaton and
Bedworth; Rugby; Stratford-on-Avon;
Warwick

EAST MIDLANDS (47 SEATS)

44 Lincolnshire Central
electorate 333349, seats 5
LAs: East Lindsey; Lincoln; North Kesteven;
West Lindsey

45 Lincolnshire South
electorate 211342, seats 3
LAs: Boston; South Holland; South Kesteven

46 Nottinghamshire North
electorate 343107, seats 5
LAs: Ashfield; Bassetlaw; Mansfield; Newark
and Sherwood

47 Nottinghamshire South
electorate 454550, seats 6
LAs: Broxtowe; Gedling; Nottingham;
Rushcliffe

48 Derbyshire North

electorate 346603, seats 5
LAs: Bolsover; Chesterfield; Derbyshire Dales; High Peak; North East Derbyshire

49 Derbyshire South

electorate 440256, seats 6
LAs: Amber Valley; Derby; Erewash; South Derbyshire

50 Leicestershire North and Rutland

electorate 372206, seats 5
LAs: Charnwood; Hinckley and Bosworth; Melton; North West Leicestershire; Rutland

51 Leicestershire South

electorate 402342, seats 5
LAs: Blaby; Harborough; Leicester; Oadby and Wigston

52 West Northamptonshire

electorate 279313, seats 4
LAs: Daventry; Northampton; South Northamptonshire

53 North Northamptonshire

electorate 242263, seats 3
LAs: Corby; East Northamptonshire; Kettering; Wellingborough

EASTERN (61 SEATS)

54 Cambridgeshire North

electorate 323426, seats 4
LAs: Fenland; Huntingdonshire; Peterborough

55 Cambridgeshire South

electorate 261042, seats 4
LAs: Cambridge; East Cambridgeshire; South Cambridgeshire

56 Norfolk West

electorate 298098, seats 4
LAs: Breckland; King's Lynn and West Norfolk; North Norfolk

57 Norfolk East

electorate 376131, seats 5
LAs: Broadland; Great Yarmouth; Norwich; South Norfolk

58 Suffolk West

electorate 269734, seats 4
LAs: Babergh; Mid Suffolk; West Suffolk

59 Suffolk East

electorate 282411, seats 4
LAs: East Suffolk; Ipswich

60 Essex East

electorate 299187, seats 4
LAs: Colchester; Maldon; Tendring

61 Essex North

electorate 309260, seats 4
LAs: Braintree; Chelmsford; Uttlesford

62 Essex West

electorate 326903, seats 5
LAs: Brentwood; Epping Forest; Harlow; Thurrock

63 Essex South

electorate 399640, seats 5
LAs: Basildon; Castle Point; Rochford; Southend-on-Sea

64 Hertfordshire East

electorate 268695, seats 4
LAs: East Hertfordshire; North Hertfordshire; Stevenage

65 Hertfordshire South

electorate 282240, seats 4
LAs: Broxbourne; Hertsmere; Watford; Welwyn Hatfield

66 Hertfordshire West

electorate 281817, seats 4
LAs: Dacorum; St Albans; Three Rivers

67 Bedfordshire

electorate 461241, seats 6
LAs: Bedford; Central Bedfordshire; Luton

LONDON (75 SEATS)

68 Ealing and Hillingdon

electorate 398393, seats 5
LAs: Ealing; Hillingdon

69 Brent and Harrow

electorate 357652, seats 5
LAs: Brent; Harrow

70 Barnet and Camden

electorate 373028, seats 5
LAs: Barnet; Camden

71 Enfield and Haringey

electorate 354719, seats 5
LAs: Enfield; Haringey

72 London North East
electorate 468566, seats 6
LAs: Hackney; Islington; Waltham Forest

73 Havering and Redbridge
electorate 370407, seats 5
LAs: Havering; Redbridge

74 London South West
electorate 406164, seats 6
LAs: Hounslow; Kingston upon Thames;
Richmond upon Thames

75 London West Central
electorate 309643, seats 4
LAs: Hammersmith and Fulham; Kensington
and Chelsea; Westminster

76 City and East
electorate 487881, seats 7
LAs: Barking and Dagenham; City of
London; Newham; Tower Hamlets

77 Merton and Wandsworth
electorate 338061, seats 5
LAs: Merton; Wandsworth

78 Lambeth and Southwark
electorate 406960, seats 6
LAs: Lambeth; Southwark

79 Greenwich and Lewisham
electorate 357354, seats 5
LAs: Greenwich; Lewisham

80 Croydon and Sutton
electorate 396729, seats 5
LAs: Croydon; Sutton

81 Bexley and Bromley
electorate 404928, seats 6
LAs: Bexley; Bromley

SOUTH EAST (91 SEATS)

82 Kent North
electorate 342899, seats 5
LAs: Dartford; Gravesham; Medway

83 Kent Central
electorate 321344, seats 4
LAs: Ashford; Maidstone; Swale

84 Kent East
electorate 374645, seats 5
LAs: Canterbury; Dover; Folkestone and
Hythe; Thanet

85 Kent West
electorate 269107, seats 4
LAs: Sevenoaks; Tonbridge and Malling;
Tunbridge Wells

86 East Sussex
electorate 409854, seats 6
LAs: Eastbourne; Hastings; Lewes; Rother;
Wealden

87 Sussex South
electorate 447686, seats 6
LAs: Adur; Arun; Brighton and Hove;
Worthing

88 Sussex West
electorate 388290, seats 5
LAs: Chichester; Crawley; Horsham; Mid
Sussex

89 Surrey East
electorate 386953, seats 5
LAs: Elmbridge; Epsom and Ewell; Mole
Valley; Reigate and Banstead; Tandridge

90 Surrey West
electorate 458283, seats 6
LAs: Guildford; Runnymede; Spelthorne;
Surrey Heath; Waverley; Woking

91 Milton Keynes
electorate 180294, seats 3
LAs: Milton Keynes

92 Buckinghamshire
electorate 396713, seats 6
LAs: Buckinghamshire

93 Oxfordshire
electorate 492268, seats 7
LAs: Cherwell; Oxford; South Oxfordshire;
Vale of White Horse; West Oxfordshire

94 Berkshire East
electorate 276726, seats 4
LAs: Bracknell Forest; Slough; Windsor and
Maidenhead

95 Berkshire West
electorate 349108, seats 5
LAs: Reading; West Berkshire; Wokingham

96 Hampshire NE
electorate 362511, seats 5
LAs: Basingstoke and Deane; East
Hampshire; Hart; Rushmoor

97 Hampshire South
electorate 388023, seats 5
LAs: Fareham; Gosport; Havant; Portsmouth

98 Hampshire Central
electorate 288522, seats 4
LAs: Eastleigh; Test Valley; Winchester

99 Southampton and New Forest
electorate 297602, seats 4
LAs: New Forest; Southampton

100 Isle of Wight
electorate 109891, seats 2
LAs: Isle of Wight

SOUTH WEST (58 SEATS)

101 Bournemouth, Christchurch and Poole
electorate 282845, seats 4
LAs: Bournemouth, Christchurch and Poole

102 Dorset
electorate 298106, seats 4
LAs: Dorset

103 Wiltshire
electorate 371728, seats 5
LAs: Wiltshire

104 Swindon and Cotswold
electorate 223414, seats 3
LAs: Cotswold; Swindon

105 Gloucestershire West
electorate 405187, seats 6
LAs: Cheltenham; Forest of Dean; Gloucester; Stroud; Tewkesbury

106 South Gloucestershire
electorate 214339, seats 3
LAs: South Gloucestershire

107 Bristol
electorate 320825, seats 4
LAs: Bristol, City of

108 Somerset North
electorate 298793, seats 4
LAs: Bath and North East Somerset; North Somerset

109 Somerset
electorate 423778, seats 6
LAs: Somerset

110 Devon East
electorate 207013, seats 3
LAs: East Devon; Exeter

111 Devon North
electorate 340471, seats 5
LAs: Mid Devon; North Devon; Teignbridge; Torridge; West Devon

112 Devon South
electorate 361441, seats 5
LAs: Plymouth; South Hams; Torbay

113 Cornwall and Scilly
electorate 431501, seats 6
LAs: Cornwall; Isles of Scilly

WALES (32 SEATS)

114 Gwynedd
electorate 226626, seats 3
LAs: Conwy; Gwynedd; Isle of Anglesey

115 Clwyd
electorate 285767, seats 4
LAs: Denbighshire; Flintshire; Wrexham

116 Powys
electorate 103433, seats 2
LAs: Powys

117 Dyfed
electorate 292719, seats 4
LAs: Carmarthenshire; Ceredigion; Pembrokeshire

118 West Glamorgan
electorate 283958, seats 4
LAs: Neath Port Talbot; Swansea

119 Mid Glamorgan
electorate 327805, seats 4
LAs: Bridgend; Merthyr Tydfil; Rhondda Cynon Taf

120 South Glamorgan
electorate 350435, seats 5
LAs: Cardiff; Vale of Glamorgan

121 Gwent West
electorate 252108, seats 3
LAs: Blaenau Gwent; Caerphilly; Torfaen

122 Newport and Monmouthshire
electorate 181789, seats 3
LAs: Monmouthshire; Newport

SCOTLAND (57 SEATS)

123 Orkney and Shetland

electorate 34387, seats 1

LAs: Orkney; Shetland

124 Na h-Eileanan an Iar

electorate 21151, seats 1

LAs: Eilean Siar

125 Highland and Argyll

electorate 245440, seats 4

LAs: Argyll and Bute; Highland

126 Grampian

electorate 418605, seats 6

LAs: Aberdeen; Aberdeenshire; Moray

127 Tayside

electorate 191982, seats 3

LAs: Angus; Dundee

128 Perthshire and Stirling

electorate 217796, seats 3

LAs: Clackmannanshire; Perth and Kinross; Stirling

129 Fife

electorate 276211, seats 4

LAs: Fife

130 West Central Scotland

electorate 334919, seats 4

LAs: East Renfrewshire; Inverclyde; Renfrewshire; West Dunbartonshire

131 Glasgow

electorate 437909, seats 6

LAs: Glasgow

**132 North Lanark and East
Dunbartonshire**

electorate 336687, seats 5

LAs: East Dunbartonshire; North Lanarkshire

133 South Lanark

electorate 249304, seats 3

LAs: South Lanarkshire

134 Ayrshire

electorate 289592, seats 4

LAs: East Ayrshire; North Ayrshire; South Ayrshire

135 Falkirk and West Lothian

electorate 253055, seats 3

LAs: Falkirk; West Lothian

136 Edinburgh

electorate 349398, seats 5

LAs: Edinburgh

137 Southeast Scotland

electorate 241000, seats 3

LAs: East Lothian; Midlothian; Scottish Borders

138 Dumfries and Galloway

electorate 114993, seats 2

LAs: Dumfries and Galloway

NORTHERN IRELAND (18 SEATS)

139 Northern Ireland West

electorate 288485, seats 4

LAs: Derry and Strabane; Fermanagh and Omagh; Mid Ulster

140 Northern Ireland North

electorate 295456, seats 4

LAs: Antrim and Newtownabbey; Causeway Coast and Glens; Mid and East Antrim

141 Northern Ireland East

electorate 341826, seats 5

LAs: Ards and North Down; Belfast

142 Northern Ireland South

electorate 369921, seats 5

LAs: Armagh City, Banbridge and Craigavon; Lisburn and Castlereagh; Newry, Mourne and Down

Appendix: Methodology

The overall methodology is "boundaries first, allocation second". Thus, using the electoral quota for the UK (electors/650) of about 73 K as a guide, constituencies based on LAs were identified with electorates of 250-400 K where possible, but allowing 200-500 where necessary. That corresponds roughly to "prefer 4 or 5 member constituencies, but 3, 6 or 7 are allowed where necessary. The 3-7 seat range is widely agreed to work best for STV, and is recommended more generally for electoral systems by the electoral experts Carey and Hix (2011).

This roughly 1:2 range of sizes gives sufficient flexibility to draw up boundaries entirely based on LAs, and where grouping several together is required doing so in a way that fits local ties. It is interesting to note that current government guidelines for the size of new Unitary Authorities agree not only in having a 1:2 range of allowed sizes, but choosing almost exactly the same size range - population 300-600 K, which corresponds to roughly 200-400 K electorate.

Once boundaries have been drawn, seats can be allocated by any of the well-established sharing algorithms. The US Huntington-Hill (HH) method for allocations of congressional seats between states is used here; St Lague would give very similar results. Each works in terms of a quota: St L gives seats equal to the nearest whole number of quotas arithmetically, HH does the same in proportional terms. There is very little difference, but conceptually HH seems preferable - certainly its adoption in the US came after careful consideration and after trying out d'Hondt, St L and at least one other method previously. In either case the maximum discrepancy in parity (at the borderline between allocating 3 and 4 seats) is around 15%. But the standard deviation in parity is only around 6%, and the overall effect on the key question of whether a party or coalition has a majority is less than 1%.

A key advantage of the present scheme is that it can be updated very easily to current electorates. Traditional boundary revisions may give a smaller variation in parity initially, but with revisions at best at around 10 year intervals they can easily drift to much greater variability - and importantly, such drift may be biased, if (for example) there is a shift in the balance of population between urban and rural areas. A more theoretical point - worth mentioning because it may seem counter-intuitive - is that having varying seat sizes (here mainly 3 to 6), which is obviously necessary to fit communities, can actually be expected to give a better fit to the national vote distribution than having fixed seat size. Confirmatory evidence for this is that Ireland, with its 3-5 seat constituencies, has slightly better proportionality than the Northern Ireland Assembly with its all-6-seat (now all-5-seat) constituencies.

A small number of geographically special cases are allowed: the two Scottish island constituencies and the Isle of Wight, plus two very extensive rural LAs, that do not group easily with a neighbour. These are Dumfries and Galloway and Powys, which each have electorates close to that of the Isle of Wight. An allowance of "+10%" has also been made for the geographically huge area of the Highlands and Argyll which would otherwise fall just short of getting 4 seats. For the 1 and 2-seat cases a 1-sided limit on unfairness is used, so that no seat can have more than 15% electors above quota.

Wider issues, including alternative ways of doing STV, and comparison of STV with alternative PR systems, are discussed in Mollison (2023).

References

Carey, John M and Hix, Simon (2011) 'The Electoral Sweet Spot: Low-Magnitude Proportional Electoral Systems', *American Journal of Political Science*, **55**, 2, 383-397.

Mollison, Denis (2023) 'Fair votes in practice' (*available in draft*)