

Work Session on Geographical Information Systems  
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**UK STANDARD GEOGRAPHIC BASE - CONCEPTS AND  
IMPLEMENTATION PLANS**

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## **I. Background**

1. Unlike many other countries within the EC, the UK has a number of government departments involved in providing geographically referenced statistics throughout Northern Ireland, Scotland, England and Wales. The UK also has two mapping agencies, covering Great Britain and Northern Ireland. The distribution of GIS interests therefore provides the UK with a standardisation problem, the extent of which may not be mirrored elsewhere.
2. Within the Office for National Statistics (ONS), we have a geographic support service (OGSS) which provides geographic metadata, i.e. names, codes, descriptions and presentation orders for many different geographies in the UK. It also provides linking mechanisms between a number of these geographies, with the help of information from our colleagues from the other countries within the UK. This information is provided to a wide range of customers, within central and local government, the National Health Service, Academia and the private sector.
3. OGSS however is not the only source of this type of geographic information within the UK and many other government departments provide names and codes for their users. In late 1995, it was suggested to the government-wide group on geography information (IGGI) that benefits would be gained throughout government, and potentially in the wider geographic community, if the OGSS became the standard service. A consortium was funded by members of IGGI to carry out a research project to propose a framework for describing spatial units, a core set of spatial units and to make recommendations on standardisation and implementation of this core set, taking into account the costs and benefits.
4. In April 1996 the concept of the UK Standard Geographic Base (UKSGB) was formed. The research project recommended that benefit would be gained from a published collection of widely used spatial units as a UKSGB. Although this recommendation was accepted, the proposed implementation provided a comprehensive multi-million pound sterling solution, which was thought unlikely to be achievable in the current financial climate.
5. Subsequently ONS were asked to review the findings of the research project and to lead a small inter-departmental project group to identify a pragmatic and achievable approach which could be implemented in the short term. The proposed solution was required to meet the UK core requirements and demonstrate the commitment to, and capability of, the UKSGB. In assessing the way forward, the project group sought options which would be attractive to the statistical users, the physical geographers and to those with interests in land and property. These options were then assessed, supported by a business case and outline implementation plans were produced. These plans have now been agreed in principle and implementation is about to start.
6. This paper will outline the need for a standardised approach in the UK, will describe briefly the concepts of the UKSGB and will outline how we hope to implement it over the next few years.

## **II. WHY DO WE NEED A STANDARDIZED GEOGRAPHY IN THE UK**

7. There are many reasons why we need to standardise our approach to geography in the UK. Three reasons have already been mentioned, i.e. there are four independent countries, two mapping agencies and many government departments providing geographically referenced statistics. There are many other problems also, mainly because:
  - a) the geographies are wide ranging and extremely complex
  - b) the commonly used geographies, administrative and postal, do not align
  - c) there are frequent boundary changes and occasional major reorganisations
  - d) there is currently no accurate way of defining stable areas required for time series statistics

- e) area names change frequently and different versions are used
- f) there are many different coding systems
- g) there is no central authoritative source of geographic reference information.

8. The result is that there is often an incomplete understanding of the different geographies, and how they link, particularly when comparing different geographies and seeking stable areas for time series statistics. Inaccurate statistics can be produced because of the use of best fit links between a number of different geographies. The lack of understanding and the possibility of inaccuracy is now being recognised, particularly by those organisations which use GIS technology and are aware of the likely incompatibilities between data sets and available digitised boundaries.

9. There is often little compatibility between different users and systems and the result is confusion, duplication of effort, particularly in keeping systems up to date with changes, and lost opportunities for the use of geographic data.

10. The UK therefore urgently needs a mechanism to:

- a) provide an authoritative source of geographic reference information
- b) act as a bridge between different geographies
- c) provide standards for naming and coding
- d) disseminate and ease the use of standards
- e) improve compatibility between users
- f) help integrate data held in separate systems
- g) encourage the stability of boundaries.

### **III. THE UK STANDARD GEOGRAPHIC BASE - CONCEPTS**

11. The UK Standard Geographic Base attempts to provide the mechanism required. Current plans for the base attempt to achieve this by providing:

- a) a recognised standard set of UK core spatial units
- b) published details about this standard set
  - list of core spatial unit specifications
  - details of every instance of each area type, including name, code, links with parent and other geographies
- c) accredited data sets
- d) an on-line service and customer support.

#### ***A recognised standard set of UK areas***

12. The standard set of core areas selected will cover the UK and will provide detailed building blocks, pivotal units, hierarchical areas and links with other commonly used geographies. The units proposed for the UKSGB are shown in Figure 1.

**Figure 1. The core spatial units of the UK Standard Geographical Base**

13. The BLPU is a new unit called the Basic Land and Property Unit, which currently exists in selected Local Authorities. It provides a reference to a single address or land parcel. Other units are either postal geography, e.g. postal address, unit postcode and postcode sector, or administrative, e.g. ward and above. Because of the differences in the counties within the UK, the model has separately identified areas in all four countries.

14. Links between core spatial units are provided. Links with other standard or commonly used geographies, can be provided if they can easily be defined in terms of core spatial units. Examples which can be included are:

- a) electoral constituencies
- b) government office regions and
- c) NUTs areas.

***Published details about this standard set***

15. The list of core spatial unit specifications, referred to as the UK Directory, will be created to provide details of each different unit type to include:

- a) description of unit, its owner or custodian
- b) defined boundary and owner
- c) defined grid referencing system
- d) coverage and life cycle of the spatial unit.

An example of a spatial unit specification for the UK Directory is shown in Table 1.

**Table 1. Example of Spatial Unit Specification for UK Directory**

Characteristics	Details	
<b>Descriptor</b>  <b>ELECTORAL WARD IN ENGLAND</b>	<b>Meaning</b>	<i>A logical grouping of contiguous community areas with little restriction on size. An electoral subset of LA District.</i>
	<b>Format</b>	<b>Name</b>
	<b>Owner</b>	<i>Local Government Commission</i>
	<b>Custodian</b>	<i>Local Government Commission</i>
	<b>Range of values</b>	
<b>Theme</b>	<i>Electoral Statistical</i>	<b>Main Use(s)</b>
<b>Parent Class</b>	<i>County District or Unitary Authority</i>	
<b>Spatial representation - Type</b>	<i>Contiguous</i>	
<b>Spatial representation- Definition</b>	<b>Representative Point</b>	
	<b>Textual description</b>	
	<b>Derived Polygon</b>	
	<b>Explicit Polygon</b>	✓
<b>Spatial representation- Attributes</b>	<b>Co-ordinate system</b>	<i>National Grid</i>
	<b>Co-ordinate precision</b>	<i>Basic scales mapping</i>
	<b>Co-ordinate resolution</b>	<i>Basic scales mapping</i>
	<b>Source</b>	<i>Local Government Commission</i>
	<b>Authority for issue and maintenance</b>	<i>Ordnance Survey map boundary</i>
<b>Spatial representation Life cycle</b>	<b>Event date</b>	<b>Event Description</b>
	?	Creation date
	<i>Within 6 months of Statutory Instrument</i>	Ordnance Survey map boundary
<b>Coverage</b>	<b>United Kingdom</b>	✓
	<b>Great Britain</b>	
	<b>Country</b>	<i>England</i>
	<b>County</b>	
	<b>Other</b>	
<b>Life cycle</b>	<b>Event Date</b>	<b>Event Description</b>
	Decennially, last one 1994	Creation date
		Major Review date
<b>BSI/CEN/ISO standards applicable</b>	<b>Name</b>	<b>Date/Status</b>
	No standards	
<b>Contact point</b>	<b>Organisation</b>	<b>Address and Tel No.</b>

16. The proposal is that this UK Directory of core spatial unit specifications will be maintained by a UK Guardian and will be made available on the Internet.
17. The published file of details of every instance of each area type, including name, code, parent and links with other coding systems and geographies, is referred to as the UK Gazetteer. This is a much more complex file or series of files. The UK Gazetteer, provides a page of detail for every instance, for example one page for each of the 10,200 wards in England.
18. For every instance, the UK Gazetteer, or the series of Unit Gazetteers, will provide:
- a) the official name, code and boundary
  - b) any previous name code or boundary for the same area
  - c) a description of the parent
  - d) alternative commonly used codes or names
  - e) links to other geographies.
19. An example of a gazetteer page is given at annex A.

#### *Accredited data sets*

20. There are a number of sources of data for the UKSGB and implementation will need to determine whether these can form part of the hub of the UKSGB, as the UK Gazetteer, or form part of the overall UKSGB service as accredited datasets.
21. The datasets concerned are:
- a) Official names and codes from the Office for National Statistics
  - b) Postal addresses and unit postcodes from Royal Mail
  - c) Address points, area centroids, boundaries and contextual map bases from the mapping agencies.

#### *On-line service and customer support*

22. The provision of an on-line service to the UK Directory has already been mentioned. Ideally, the UKSGB should also provide an on-line service to the UK Gazetteer, containing all the data required. With the current approach, based primarily on goodwill, this is unlikely. A more realistic approach could include:
- a) on-line access to Local Authority Gazetteer, i.e. ward level and above in the diagram at para. 12
  - b) links to accredited building block gazetteers, of unit postcode, postal address, centroids and boundaries, and
  - c) easy user interface via keyword searches or drill down maps.

23. If the UKSGB is to act as the authoritative source of names, codes etc. and be the focal point for notification of changes, a strong responsive Customer Support area is required. The OGSS already provides this service and could act as the focal point of the UKSGB.

#### **IV. IMPLEMENTATION PLANS FOR THE UKSGB**

24. The project group has assessed the options for providing a UKSGB and carried out an evaluation of the business justification for the chosen option. It became clear that the best way forward, which would deliver benefits in the first three years, was to target work on the standard,

the UK Directory and the datasets. A proposal was put forward to key potential users and suppliers of the UKSGB. This identified the work ahead, their potential contribution in terms of resource and data, and the likely time scale. Additional funding was also requested.

25. The replies to the proposal demonstrated a strong commitment and willingness to help, but no funding was offered. As a result, the approach was modified to make best use of the offers of assistance and of relevant initiatives which already exist within the geographic arena and could move us forward.

26. Work was split into two phases and nine blocks of work were identified. These projects, which required effort and data from a number of government departments, from local government and support from the British Standards Institute (BSI) are given below:

27. **Phase 1, by April 1999**

1. Setting the standard
- 2- 4. Providing the consistent data for
  2. Standard LA codes and gazetteer
  3. Postcode and postal address gazetteers
  4. Centroids, boundaries and map bases
5. Defining and procuring the service

28. **Phase 2, by April 2001**

- 6- 8. Providing data for enhanced UKSGB
  6. Preparation of full coverage Basic Land & Property Units
  7. Provision of unit postcode boundaries
  8. Alignment of boundaries
9. Enhancing the UKSGB service

***Phase 1 projects***

29. Project 1, setting the standard is a key activity which underpins all the other projects. This project includes four main activities:

- a) define and publish the UKSGB standard, with the aid of the BSI
- b) define accreditation arrangements
- c) publish and promote the standard and UK Directory
- d) define minimum service provision.

30. The data supply for phase 1, ie. projects 2 to 4, will need careful handling. There are a number of similar, although not identical, data products on the market. Owners of these products are conscious of their commercial value. Whilst the UKSGB provides the opportunity to achieve consistent data from different suppliers, it can only realise this with the co-operation of all the key suppliers and a sensitive approach to copyright and charging issues.

31. Due to the lack of funding, we are unable to develop an on-line service (project 5), without the support of the private sector and the Private Finance Initiative. We therefore need to consider the best way forward. The activities proposed are to:

- a) investigate the scope of service and feasibility of providing it
- b) expand minimum service provision provided by project 1
- c) procure the service - Internet?
- d) provide the Service, including the user interface, the charging mechanisms and the Service Level Agreements with data suppliers.

### *Phase 2 projects*

32. Phase 2 provides the opportunities for enhancing the data and service within the UKSGB. This phase will be planned early but is unlikely to be implemented until 2001 or possibly later, particularly in the case of full coverage Basic Land and Property Units.

33. Work has already started on the definition of unit postcode boundaries, although finding a standard approach for all applications is not an easy task. Because of the lack of funding, this work may need to be allied to other major initiatives, such as the 2001 Census.

34. Work on the alignment of boundaries is currently seen as unlikely to result in full common alignment. However, the UKSGB initiative may inspire a lobbying force capable of influencing the boundary commissions and achieving improved alignment. Alternatively it could provide guidance and a standard approach to boundary change which could go some way to reducing the complexities of geography in the UK.

## **V. CONCLUSION**

35. There are many difficulties in the UK which restrict the efficient use of GIS, not least of which is the complexity of the geographies we use and the lack of standardisation. The UKSGB is a worthwhile initiative which, if it can be successfully implemented, will go a long way towards solving some of these difficulties.

36. However the success of the UKSGB is currently dependent on the goodwill of the key suppliers of geographical data. Some of these suppliers have strong commercial interests and we await the results of the work which attempts to bring them together to provide consistent data.

37. There is strong interest in the initiative from the commercial sector and many of these organisations, although not providing resources or data themselves, will reap the benefits. By the time of the GIS Work Session, we will be able to review the outline plans and the timetable and be in a better position to tell if the initiative is likely to deliver a UKSGB.

**CORE UNIT INSTANCE DESCRIPTION FOR GAZETTEER: EXAMPLE**

<b>Characteristics</b>	<b>Details</b>	
<b>Class</b>	<i>ELECTORAL WARD</i>	
SGB ref. number	<i>W123456</i>	Date of creation : <i>1/4/96</i>
Current name	Name : <i>Crosby and Park</i>	Date of creation : <i>1/4/96</i>
	Abbreviated name : -	
Current code	Code : <i>ME</i>	Date of creation : <i>1/4/96</i>
Boundary data	Source : <i>S45</i>	Revision : -
Legal basis		
Previous SGB ref. Number	<i>W123431</i>	
Previous Name	Name : <i>Crosby Town North</i>	Dates when valid: <i>10/3/93 - 31/3/96</i>
Previous Code	Code : <i>MF</i>	Dates when valid: <i>10/3/93 - 31/3/96</i>
Previous boundary data	Source : -	Revision :
<b>Parent class</b>	<i>UNITARY AUTHORITY</i>	
Current parent name	Name : <i>North Lincolnshire UA</i>	Date of creation : <i>1/4/96</i>
Current parent code	Code : <i>FD</i>	Date of creation : <i>1/4/96</i>
Previous parent name(s)	Name : <i>Scunthorpe District</i>	Dates when valid : <i>10/3/93 - 31/3/96</i>
Previous Parent code(s)	Code : <i>27UK</i>	Dates when valid : <i>10/3/93 - 31/3/96</i>
<b>Links to other coding systems</b>		
Name of system	DoE Code	
Code used	L5809	
<b>Links to Other Geography 1</b>		
Other Geography - type	<i>GOR</i>	
Other Geography- parent code	<i>D</i>	
Other Geography parent name	<i>Yorkshire and the Humber</i>	
Boundary data	Source : <i>S43</i>	Revision :
<b>Links to Other Geography 2</b>		
Other Geography - type	<i>Parliamentary Constituency</i>	
Other Geography- parent code	<i>179</i>	
Other Geography parent name	<i>Glanford and Scunthorpe</i>	
Boundary data	-	Revision
<b>Links to Other Geography 3</b>		
Other Geography - type	<i>European Parliamentary Constituency</i>	
Other Geography- parent code	<i>6</i>	
Other Geography parent name	<i>York</i>	
Boundary data	-	Revision
<b>Metadata available</b>	Source : -	Revision :
<b>Custodian contact details</b>	ONS Geographic Support Service (OGSS) 01329 813477	