

Case Study

British Standard 7666:2006
(Parts 0, 1 and 2) and its impact and use
within English and Welsh local government



Summary

This case study explores the ways in which British Standard (BS) 7666:2006 has added real value for local government in England and Wales.

This is demonstrated through specific examples of the National Land and Property Gazetteer (NLPG) and National Street Gazetteer (NSG). This paper proves how the conformance to British Standards has improved data collation; data management and ultimately the sharing and use of data across different local government services.



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Background to British Standard (BS) 7666

BS7666:2006 is one of around 27,000 British Standards. BS7666:2006 refers specifically to the standards for geographical referencing. It comprises of parts one to five. The table below summarises the different parts of BS7666:2006.

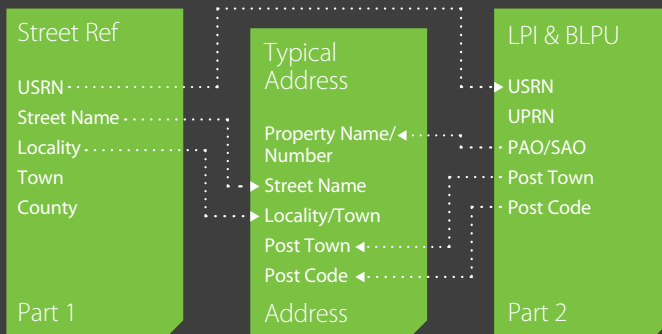
Part BS 7666-0:2006	Name General model for gazetteers and spatial referencing Contents <ul style="list-style-type: none">• defines the essential components of a gazetteer of geographic locations, and• provides a general model of spatial references based upon named spatial units in the United Kingdom• defines the attributes of each geographic location and defines the metadata associated with the gazetteer• provides the basis for the other parts of BS 7666 by defining general structures
Part BS 7666-1:2006	Name Spatial datasets for geographical referencing. Specification for a street gazetteer Contents <ul style="list-style-type: none">• specifies the data to be maintained in a gazetteer of streets, consistent with Part 0 of this standard• enables different users of street information to use the same data with consistency of content, accuracy, currency and format• different ways of referencing a street are defined so that data can be accessed by street name, description, route number, unique reference number or external cross-reference• specifies the means of representing the geometry of the street in terms of coordinates• intended for use by those compiling street gazetteers for purposes of highways and streetworks management, property addressing and navigation
Part BS 7666-2:2006	Name Spatial datasets for geographical referencing. Specification for a land and property gazetteer Contents <ul style="list-style-type: none">• specifies the logical data structure for a gazetteer of land and property, consistent with Part 0 of this standard• based upon the concept of a basic land and property unit (BLPU), and specifies the data to be recorded and maintained in a gazetteer• specifies the way in which the boundary of a BLPU may be represented and linked to the gazetteer• does not provide a database design or a transfer format• intended for use by those compiling land and property gazetteers, for a range of purposes including property records and addressing• enables different users of land and property information to link different land and property identifiers (LPI) via a common unique property reference number (UPRN)
Part BS 7666-5:2006	Name Spatial datasets for geographical referencing. Specification for a delivery point gazetteer Contents <ul style="list-style-type: none">• specifies the logical data structure and data content for a gazetteer of delivery points• for purposes of identification, access and validation of service requests• provides a method of referencing delivery points by means of unique references and descriptive delivery addresses• does not provide a database design or a transfer format• intended for use by suppliers of delivery and collection services, such as distribution organizations• facilitates data sharing to enable the provision of collaborative services• provides a consistency of references for analysis and planning purposes

Source: <http://www.bsigroup.com/en/>

BS7666 has been revised several times since its inception in 1994, the last revision being in 2006. The NSG and NLPG conform to parts 0 and 1, and additionally the NLPG conforms to part 2. BS7666:2006 specifies a standard format for holding details on every property and street.

In terms of streets information, each street may be recorded at a simple or complex level. The simple level provides a street name or description and location elements, such as locality and town, together with spatial extremity points – all referenced to a unique street reference number (USRN). At the complex level, additional section detail (Elementary Street Units) is added to each street including all the coordinate information required to represent the full geometric centre-line representation of that street. Additional street information is recorded against each elementary street unit such as status, restrictions, etc.

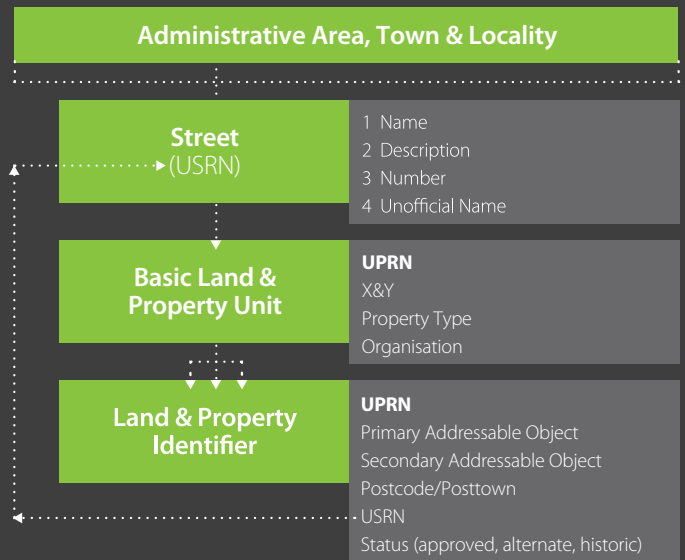
BS7666 – Land, Property and Streets



As far as properties are concerned, the standard is based on the concept of a land parcel unit known as a Basic Land and Property Unit (BLPU). A BLPU is defined in BS7666 part 2 as “an area of land in uniform property rights or, in the absence of such ownership evidence or where required for administration purposes, inferred from physical features, occupation or use”. Examples of BLPUs include residential houses, commercial units, parks and statues.

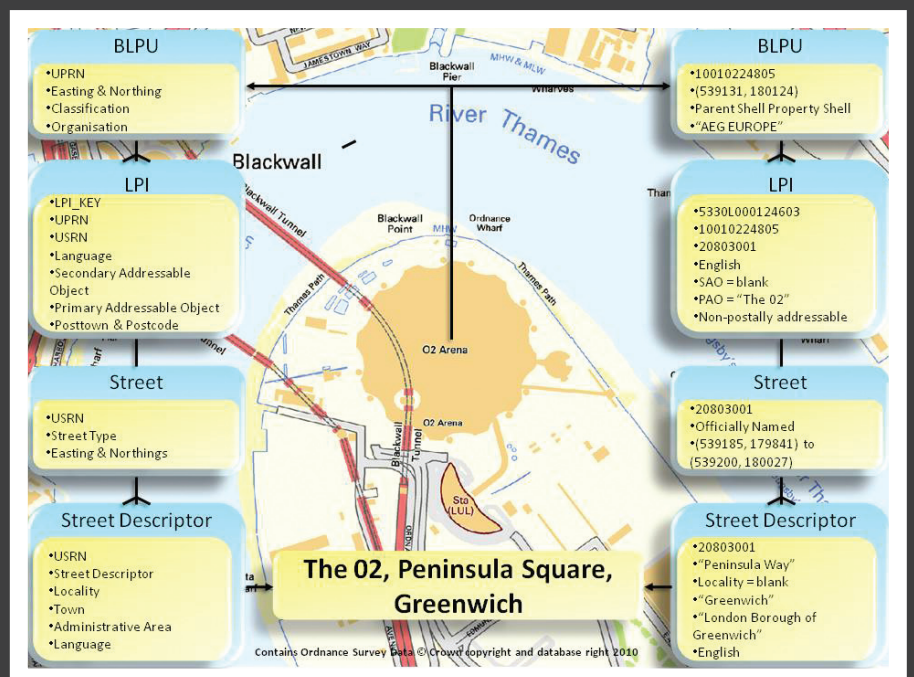
Each BLPU has a unique property reference number (UPRN), a spatial reference (easting and northing) and one or more Land and Property Identifiers (LPI). The LPI is basically the address of the BLPU in a standard format that uniquely identifies the BLPU and references each one to a street as defined and held in the National Street Gazetteer (NSG). The principal components of the LPI are the UPRN from the BLPU, the Unique Street Reference Number (USRN) from the NSG and sufficient elements from the hierarchy of Primary and Secondary Addressable Objects (PAOs and SAOs) which contain for example house names and numbers, necessary to uniquely identify the BLPU.

The following diagram demonstrates how this works in terms of recording of data:



Similarly, as the diagram above demonstrates, the standard enables both a typical address to be created for use as well as more detailed information which is then available as a national resource.

The following diagram demonstrates how this works in practice using the example of the O₂ Arena.



About the NLPG and NSG

The objective of the NLPG and NSG is to create an intelligent, comprehensive and up to date record of land, property and streets in England and Wales and to be able to share it between local authorities and other local government organisations such as police forces and fire and rescue services for example. The data are created by local authorities under street naming and numbering statutory duty. The data are collated from local authorities into a national hub thereby creating a national address resource. Key to the facilitation of this data sharing is the basis of the NLPG and NSG on British Standards.

Every local authority in England and Wales provides their Local Land and Property Gazetteer (LLPG) to the national hub, the NLPG, for collation and verification. The data is updated by every authority at the very least every month, but more often weekly or daily, making the NLPG the most up-to-date address and property dataset in England and Wales.

On a monthly basis, data from all local highway authorities across England and Wales is made available to third party organisations such as utilities companies and statutory undertakers to meet their statutory requirements to provide appropriate street works notifications.

Each highway authority has a statutory obligation to submit street and ASD data to the NSG hub on a monthly basis so that the information can be validated and checked for errors.

The NLPG is built upon an implementation of BS 7666-1:2006 and BS 7666-2:2006 and in essence is an index of geographically referenced real world objects utilising the concept of Records for a Street, a Basic Land and Property Unit (BLPU) and a Land and Property Identifier (LPI). BS 7666:2006 extends the scope for the recording of LPI and Street information to support the Welsh Language Act.

The common specification is designed for local implementation to enable aggregation of data at a national and transnational level. It provides a framework for sharing and integration of data from a range of local and cross government

applications using a unique address key – the Unique Property Reference Number (UPRN). This supports policy making and monitoring as well as direct shared delivery of services.

Standards in action

BS7666 forms the base level of standardisation within the NLPG and NSG implementations and across the whole NPLG and NSG processes. Additional provisions required, in order to ensure the success of the initiatives, are published including the Data Transfer Format Specification (DTF) and Data Entry Conventions (DEC). These specify the conventions with which each local authority should create and distribute their data.

The fundamental concepts provided by BS7666 are adhered to at all times and are invaluable in ensuring the datasets are utilised on the widest possible basis. Some additional requirements laid out in the NLPG and NSG can be proposed in the BS7666 review process to be considered for adoption in the wider standard.

Overall, BS7666 facilitates the identification and introduction of a series of improved work flows centred on the exchange of Address Change Intelligence (ACI) and provides a reference for how all types of real world land and property objects must be captured, entered and compiled in a consistent manner across England and Wales. Similarly the flexibility of the standard means that local instances can be recorded and used in a way which is of benefit for local service delivery.

Example:

The Traffic Management Act

The Traffic Management Act was introduced by the Department for Transport in 2004 to tackle congestion and disruption on the road network. The TMA mandates the use of the NSG to coordinate roadworks between authorities and utility companies. Detailed street information helps utility companies to accurately pinpoint the location of their proposed works and the associated street data gives them advance notice of any restrictions that may be in force on that street at any particular time. At present, over 660 organisations are able to use the

NSG to manage street related activities on over 1,178,000 streets in England and Wales. All this information is held in a standardised format which is transferable and interoperable between organisations due to BS7666 as its standard.

Example:

Co-ordinated Online Register of Electors (CORE)

The key objective of CORE was to facilitate effective checking of political party donations and to assist in the detection of certain types of electoral fraud. In April 2008, the Ministry of Justice (MoJ) issued new data standards which move towards implementing the CORE initiative. Through CORE, MoJ aims to develop online voting further.

The standards result in a consistent electoral register across England, Wales and Scotland, based in part on information gained through the NLPG. The standards affect the way an individual's name, date of birth and address are held and recorded in the electoral register. Some financial support is available from MoJ for local government to support this work. Furthermore, CORE further mandated the use of the BS7666 address within local government service delivery.

Example:

INSPIRE

The European Inspire directive aims to harmonise a range of spatial data across Europe. It is an ambitious project which involves developing a series of data specifications mandating how the various data sets should be recorded and shared. Early in the process, the value of BS7666 was again demonstrated after the address data specification were released. The value is that address data is already collated to a standard which makes it easier to convert into INSPIRE. Furthermore, the INSPIRE team considered elements of BS7666 in their address specification which again demonstrates its strength as a mechanism for cross border data sharing.

Essentially, local government has future proofed its work and its intelligence because it is able to output the NLPG in an INSPIRE compliant format based on the BS7666 standard.

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Benefits of standards

Overall, the benefits of BS7666 to local government include:

- sharing of data according to a common standard reduces costs in duplication, data processing, and enables interoperability.
- written by experts and based on national/international best practice
- breadth and flexibility of the system means that the wide variety of street and property information can be recorded in a standard way across England and Wales
- encourages common understanding and terminology at point of creation and use
- facilitates interoperability through data sharing and compatibility
- single data model reduces duplication of software development and future-proofs investment
- compatibility with other standards (e.g. ISO 19112) is managed by BSI and ISO at the standards level, reducing similar effort at implementation level
- provides a basis for excellent data quality and consistency
- provides a well recognised and trusted source of reference
- has official approval and has a robust change management process which enables continuity within the local government sector
- provides the opportunity to develop robust processes for the creation and maintenance of data.

Through standardised information referenced through a unique property reference number, councils across the country have realised savings. The gazetteers bring intangible as well as tangible financial benefits. A study carried out by CEBR concluded from improvements in data quality, currency and efficiency there is evidence of savings in excess of £50m per annum. In terms of tangible benefits: Plymouth identified savings of around £150,000pa simply by avoiding the duplication of addresses; Huntingdonshire increased tax receipts by around £180,000pa through the elimination of unbilled council tax and non domestic rates; savings from the use of the NSG in Cambridge are estimated at around £130,000pa from better refuse collection routing.

Further best practice case studies can be viewed here:

<http://www.iahub.net/docs/1270828962203.pdf>



Conclusion

Local government in England and Wales has been at the forefront of a standards based approach to creating street, land and property information for over a decade. The NLPG and NSG enable the different organisations to share a common language, enhancing interoperability and data sharing. The format of the NLPG and NSG enables local councils and police and fire authorities to share intelligence in a common format between their various functions. This includes customer services; environmental services; planning and disaster management. Sharing of a data according to a common standard reduces costs in duplication, data processing, etc. The NLPG also has the function to be multi-lingual, the proof of concept for this is the transference between English and Welsh.

Further information

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