ANNEXES to THE CASE FOR AN OPEN NATIONAL ADDRESS DATASET

ODUG (Open Data User Group)

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This paper represents the views of the Open Data User Group, on behalf of the Open Data Community. The views contained are independent of government bodies and private sector organisations. It has been shared with the Data Strategy Board for information.

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Annex A: Addresses and addressing background

Why are addresses so important?

Across society it is necessary to reliably identify places, people and organisations. Addresses provide the means by which we locate and reference a property or dwelling, are the most frequently used way of identifying places and are also the key to identifying people and organisations by associating names with particular addresses

There are very wide ranges of uses for which addresses are necessary for public and private purposes, whether delivering mail or other items, locating an emergency incident, recovery from natural disasters (e.g. floods), electoral registration, for central and local government administration, for businesses to locate their customers and suppliers and for individuals to source products or services they need.

Delivery of services, including utilities, can be significantly impaired where properties have not been allocated an address, or where the address is not clear. For some it may mean that a package is not delivered, is delayed, or is delivered to the wrong address. But in other cases it might mean that an ambulance is sent to the wrong place, with possibly dire consequences.

Addresses, with other personal information, are extensively used to validate the identity of an individual when making enquiries about personal matters, such as to tax, bank and credit card authorities. Addresses also form the basis of any property identification linked to property valuation, property transactions and conveyancing.

The postal variant of the address is the most frequently used form and the one that most people recognise and use. This comprises a building name or house number, a street name, sometimes a locality, and a post town followed by a postcode. A postcode[1] is restricted to a single street and refers to an average of 14 properties and a maximum of 100. Usually a house number or building name together with a postcode, will identify a single unique postal address.

However, postal addresses, with or without a postcode, have one serious limitation. They are related only to the postal delivery system. Designed to be a mail routing instruction they do not, directly, identify what ward, local authority, region or even country an address may be in. A separate look-up table is required to identify those.

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[1] Technically the most detailed version; a postcode unit

Postcodes are so useful that they have become part of our everyday language in terms such as 'postcode lottery'. However, to use postcodes, or postal addresses, as a location tool they need to be located on a map. Ordnance Survey has maintained a map grid reference for every postal address since 1993. Postcode units are located by using the map reference of the address nearest to the centre of the group of addresses covered by the postcode. This makes postcodes usable as a key to enable an address to be *approximately* located on a map, an *approximate destination* for in-vehicle navigation. Postcodes are also used as a means of rapidly entering a full address into an on-line application, a shortcut into a customer account and to match an address to a statistical or administrative area or to permit geodemographic[2] mapping.

Therefore the requirement is for a single definitive nationally consistent address gazeteeer which combines the key elements of postal, administrative and geographic addresses. *To maximise use and benefit to society this should consist of the address, postcode and geographic coordinate.*

The complexity of our society and economy is such that it is impossible to imagine how it could operate effectively or efficiently without addresses; address datasets are fundamental core-reference data, which is defined by the June 2012 Open Data White Paper – Unleashing the Potential[3] as: *"Authoritative or definitive data necessary to use other information produced by the public sector as a service in itself due to its high importance and value".* National addresses, including the postcode, are the single most fundamental set of core-reference data we can identify.

Forms of addresses

There are a number of forms of address. The most common and widely recognised is that used for postal delivery. Postal addresses are in effect routing instructions to a postal delivery point for efficient delivery of mail. However about 40% of buildings that appear on Ordnance Survey maps do not have a postal address. While the majority of those are outbuildings, extensions or agricultural buildings, many are conventional dwellings, workplaces or other functional buildings which simply happen not to receive mail. The Office for National Statistics found that these had to be taken account of to ensure that all dwellings were included in the delivery list for census forms.

These non-postal addresses are referred to by Ordnance Survey as *Objects Without a Postal Address* (OWPAs) for example, churches, outbuildings, parks and even Automatic

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[2] Allowing social characteristics to be mapped to local areas
[3] Cm8353 June 2012

Teller Machines (ATM) and bus stops must be referenced for valuation purposes but may not have a postal address, as they do not receive mail. Other non-postal addresses include *rateable hereditaments*[4] defined as address for valuation purposes and not necessarily the same as postal delivery points also *property or objects* connected into utility supply network which utility suppliers will often want to associate with billing addresses. Local Authorities also have a need for addresses that cover a much wider range of uses than just the delivery of mail including grounds and building maintenance, incidence reporting, taxation, etc.

Who owns addresses?

An individual address cannot be owned although anybody can use their own address and give it to anyone they choose to. Any organisation can compile a list of addresses received through transactions in the course of their business and the Intellectual Property Rights in maintained compiled lists of addresses is protected under Database Rights, defined in European and UK legislation[5].

The National Address Gazetteer (NAG) is the definitive single address register for England and Wales[6] providing sources of publicly-owned spatial address and street data and is recognised by the Government as the "*definitive single address register*"[7]. Given its importance to society it is essential that the NAG (or an equivalent national address register) should be solidly held in public ownership. For reasons of history, this is currently not the case in the United Kingdom.

In fact our societies in the United Kingdom operate against a myriad of different collections of address data in a tangled and inefficient network of datasets and sub-sets, involving multiple data providers and users. The legacy of allocating different aspects of address management to different bodies without an overall management framework, allowing these public bodies to claim individual database rights to the data they aggregate on behalf of the public and to restrict access to all or part of the subsequent dataset through complex licensing arrangements has resulted in an over-complex, restrictive environment which makes this core-reference data inaccessible and costly to use.

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[4] Rateable units of property
[5] http://ec.europa.eu/internal_market/copyright/prot-databases/index_en.htm
[6] In Northern Ireland the National Address Gazetteer is called Pointer.
[7] Open Data White Paper, Cm8535, June 2012

Annex B: Who has current responsibility for addresses and address datasets?

Address allocation powers have been granted in several disparate items of legislation to multiple parties. Local Authorities are responsible for naming streets and numbering properties along streets. Meanwhile, to support its Universal Service Obligation (USO) [8], regulated by Ofcom, an independent unit[9] within the Royal Mail allocates postcodes to new addresses, including some delivery points which are not recognised or provided with an address by a Local Authority. Local communities have the legal right to challenge the postal addresses allocated by Royal Mail, whose primary driver is to address locations in relation to their sorting office network[10]. On top of this, the Valuation Office Agency (VOA) has a statutory obligation to include all property subject to council tax or non-domestic business rates to the relevant address registers.

As a result of these multi-agency responsibilities the mechanisms in place to aggregate and deliver addresses have grown organically over time with multiple public bodies working on different address datasets at different times. The overall address management ecosystem is consequently a jumble of datasets and subsets, shared inefficiently from organisation to organisation for aggregation, modification and disaggregation to deliver different forms of address data for different purposes. The ultimate result across the public sector is that multiple address databases are constructed and maintained - often with different versions of the same address in use for the same location; this is a huge public inefficiency[11].

Delivering national addresses as open core-reference data should leverage readily available technology to deliver improvements in data quality, maintenance and dataset delivery. The address of a given location will be added to or changed by different bodies at different points in the lifespan of the location's address[12].

Following the creation of GeoPlace[13], a commercial joint venture set up between Ordnance Survey (OS) and Local Authorities, there has been some streamlining in the aggregation of address data through the delivery of a National Address Gazetteer (NAG)

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[8] http://www.royalmail.com/customer-service/universal-service
[9] The Address Management Unit (AMU)
[10] So a village in a rural location may be allocated a local town postal address
[11] In Northern Ireland, in 2002, over 200 different public sector address databases were found to be in use
[12] For example a building plot will be given a planning reference, when the buildings are constructed the same location will be given a Street Name, and so forth
[13] http://www.geoplace.co.uk

for England and Wales. This is delivered by the Royal Mail licensing the Postcode Address File (PAF) to GeoPlace who combine it with Local Authority addresses and the geographic co-ordinates for each address provided by OS to deliver the NAG, which is then updated by the VOA and others. PAF is separately licenced to Local Authorities under the PSMA (see below), whilst NAG is marketed and licenced by OS as AddressBase which also incorporates a PAF licence into each product.

The NAG has the potential to be a robust core-reference dataset but it, and its derivative products, are severely under-used (both publicly and commercially) as they are hampered with costly and complex licensing arrangements. For example despite GeoPlace having a PAF licence, NAG users are also required to obtain their own PAF licence from the Royal Mail.

The Public Sector Mapping Agreement (PSMA) for England and Wales[14] was put in place to allow public sector organisations to make (non-commercial) use of core geographic datasets from OS. PSMA datasets are made free at the point of use to allow the public sector to share information. This is helpful to public sector organisations and gives OS commercial protections. However, restrictions and reservations around embedded PAF data drive many public sector bodies to source address and geographic data from elsewhere, rather than the publicly funded address and geographic data which should be our national core-reference.

As there is no definitive core-reference address data which public sector bodies can use without having to consider complex licensing issues, multiple address databases are constructed and maintained, a huge public inefficiency.

For example, the Office of National Statistics (ONS) could not rely on the predecessor datasets to NAG: the Local Authority produced and aggregated NLPG (National Land and Property Gazetteer), the PAF, AddressPoint and other OS products; to produce a reliable addressed list of all dwellings in England and Wales in order to conduct the 2011 Census. This situation was overcome by ONS investing £12 million to quality assure, compare and correct these data sources and to field check 15% of the addresses listed. This resulted in a reliable national address register which appears to have contributed to an accurate census and avoided the challenges following the 2001 Census.

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[14] http://www.ordnancesurvey.co.uk/oswebsite/public-sector/mapping-agreement/index.html

ONS's plans for alternative ways of estimating population post-2011 are predicated on the maintenance of the national address register, or an equivalent resource. Sir Michael Scholar, the Chair of the UK Statistics Authority, two House of Commons Committees and a number of other bodies called for the maintenance of the national address register after the census or for it to become the basis of the NAG.

However, the data from Local Government, OS and Royal Mail supplied to and paid for by ONS was licenced on a single use basis under an agreement which prevents the data from being exchanged between the parties or re-used. The motivation for this appears to have been the wish of each of the data 'owners' to protect their intellectual property rights and their opportunities to exploit those commercially. The commercial interests of public bodies appear to override the national interest which would be best served by a single definitive national address dataset.

In 2002, a survey found that over 200 public sector address sets were in use across Northern Ireland. This situation has been overcome by an agreement between local government, Ordnance Survey Northern Ireland and Royal Mail. The resulting product is the Pointer national address dataset for Northern Ireland. This has resolved many issues, but use of the dataset is limited as it is only available on a commercial basis.

The proliferation of multiple address datasets in both the public and private sectors is inefficient and has wide implications for society; for example limiting the potential efficacy of initiatives such as *Tell Government Once or Midata*[15].

Private sector reservations around the PAF and OS licensing arrangements are also a barrier to the wide use of NAG address data. The cost and complexity of licensing AddressBase (the commercial derivative of the NAG which can be purchased under licence from OS) drives many UK private sector organisations to either use free address data sources, or to collect their own address data from customers and manage their own address datasets.

There is a strong case that a national address dataset should be delivered under government's Open Data Policy. The production of one common national address dataset supports the three key elements of this policy: of *holding government to account, driving choice and improvements in public services* and *inspiring innovation and enterprise that spurs social and economic growth*.

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[15] http://www.bis.gov.uk/news/topstories/2011/Nov/midata

Annex C: The cost and ownership issues for an Open National Address Dataset

Costs

Current NAG funding arrangements

The proposal that the NAG or AddressBase can be provided as open data free at the point of use and re-use is underpinned by the principle that the underlying costs of delivering and maintaining the components of these products are already covered within the remit or public task of various publicly owned or funded bodies.

For example, The Local Government Finance Act 1992[16] requires Local Authorities and the Valuation Office Agency to maintain a Council Tax Register of dwellings on a daily basis for the purpose of levying and collecting the tax. This register would have to exist even if the addresses from it were not used for any other purpose. Therefore the entire cost of this register is part of the cost of collecting Council Tax. On that basis this register could be made available for use and re-use under an Open Government Licence, at no additional cost.

In addition, over the last few years, many local authorities have started to levy a charge for their naming or numbering service. So developers or members of the public who need to have an address created or changed are paying a fee for that service. It is our view that that fee should contribute to the maintenance of the national address dataset. It would be efficient to part fund the dataset from such fees as well as land registration fees or, perhaps, utility connection fees which require the confirmation of an address and the matching of a meter reference.

Similarly, Royal Mail devised the Postcode system for operational reasons, and created the PAF in order to maintain the system before it was apparent that there would be a commercial demand for the file. Ofcom, the current postal regulator, has applied a number of regulatory requirements to Royal Mail which are dependent on the continued maintenance of the Postcode system. The costs incurred by Royal Mail in maintaining the PAF are the operational costs it incurs as part of holding the Universal Service Obligation (USO) to deliver to every address in the United Kingdom.

GeoPlace's role includes creating and maintaining the NAG database. GeoPlace takes the PAF, under licence from Royal Mail and data from OS which it combines to create

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[16] http://www.legislation.gov.uk/ukpga/1992/14/contents

AddressBase products which are then marketed and licenced by OS. In 2011-12 GeoPlace returned £3.1m profit on revenue of £9.4m; £2.4m of which was returned to OS under the joint venture agreement[17]. GeoPlace is funded via OS from a proportion of the revenue OS derives from AddressBase and by the Public Sector Mapping Agreement (PSMA), a ten year agreement under which government pays OS to provide address data to public sector organisations. From the evidence available there appears to be systemic evidence that the costs associated with delivering the PAF and the NAG have become overly inflated over time. We suggest that the PSMA fee, of £55m annually[18] should be redefined to cover the costs associated with making the NAG available to all parties, so no additional funding would be necessary to deliver a national address dataset as open data.

PAF costs summary

In the mid-1980s, When Royal Mail were developing the PAF and products associated with it the cost of running the Address Management Unit (AMU) were in the order of £3m per annum[19]. The current turnover of the AMU, based on maintaining and distributing the PAF, and regulated to make a surplus of no more than 10%, now approaches £30m per annum[20]. It is difficult to understand how £30m is the reasonable cost of maintaining a relatively stable file with 28.2 million addresses in it. Our research indicates that no more than about 1.2m entries in the PAF change each year and, of those, only about 300,000 are completely new addresses.

It is our estimate that the AMU, if it was putting the PAF out as open data, should cost no more than £5m p.a. to run and this should be absorbed as an operational cost within the Royal Mail, associated with its Universal Service Obligation (USO)

Not only is PAF licensing complex and overpriced but there is evidence of multiple PAF licensing within the same supply chain since PAF is separately licenced to GeoPlace for internal purposes and then to Local Authorities under the PSMA. Meanwhile NAG is marketed and licenced by OS as AddressBase which also incorporates a PAF licence into each product.

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[17] http://www.ordnancesurvey.co.uk/oswebsite/docs/annual-reports/ordnance-survey-annual-report-and-accounts-2011-12.pdf
[18] http://www.ordnancesurvey.co.uk/oswebsite/docs/annual-reports/ordnance-survey-annual-report-and-accounts-2011-12.pdf
[19] Robert James Tweet @geographer52.
[20] PAF Advisory Board http://www.pafboard.org.uk/

Royal Mail should make the Postcode Address File (PAF) available as open data under an Open Government Licence. We argue that paid for PAF licensing should be removed in its entirety because the current PAF licensing regime is over-complex, costly to manage, an unnecessary administrative burden across the public sector and both a burden and a barrier to private sector innovation.

Similar conclusions have been drawn in other European countries, most notably the Netherlands, where the government sold their equivalent to the PAF to the new private owner of their Post Office and recently fought and won an EU court case[21] to enable them to buy it back in order to create a national address and buildings register.

The Danish Government evaluated the advantages and disadvantages of different ownership models for address data and concluded that a publicly owned free to use address data set served their national interest best; free-of-charge address data was released in 2002.

The current PAF licensing regime is complex, costly, restricts growth and innovation and should be simplified. However, ODUG is not proposing that the public should buy the PAF back from the Royal Mail. Our proposal is that the Royal Mail should simply release the PAF, under Open Government Licence, for free. Making the PAF open data would reduce one (relatively small) area of Royal Mail operating costs and the Royal Mail would have equal access to the open data PAF, alongside all other users.

NAG costs summary

GeoPlace is reported by OS as making £3.1m profit on £9.4m revenue. We question the current policy which allows a publicly owned entity to generate some 30% profit on the delivery of definitive core-reference data products, derived from publicly funded data for which they have a monopoly since local government is the only source of definitive address data under legislation, also the rationale that 75% of these profits should be passed back to OS. These profits effectively constitute a tax levied on the use of essential address information and, we presume, are then used to support other activities within OS.

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[21] www.prlog.org/11794884-dutch-data-from-the-key-register-of-addresses-and-buildings-bag-now-available-for-re-use.html

Ordnance Survey AddressBase Products

OS generates its revenue through licensing intellectual property rights in data under Crown copyright[22] including three AddressBase products: AddressBase with commercial and residential Royal Mail PAF addresses, matched to the local authority Unique Property Reference Number (UPRN); AddressBase Plus adding objects addressed by Local Authorities and those without postal addresses, such as subdivided properties, places of worship and community centres; and AddressBase Premium including information relating to an address or property from creation to retirement or demolition.

From available information, including OS itself acknowledging in its 2011-12 Annual Report that, 'the increase of £11.2m in trading revenue is principally as a result of the 1 April 2011 commencement of the PSMA,' we believe that OS could deliver an open data AddressBase dataset, as part of its open data commitments, without undue financial detriment to its business.

We evidence this from the Annual Report where £86m (62%) of OS's 2011-12 revenue of £139m came from the government, including £55m to deliver the PSMA. OS clearly has a strong high-end business delivering value-add products to the private sector where revenues for the year remained stable at £53m, 'due to growth in new markets offsetting the continued effect of product substitution following the 2010 launch of OS OpenData'. OS, a Trading Fund, has a Return on Capital Employed (ROCE) target of at least 6.5% set by the Treasury. Its operating surplus for 2011-12 was 26%. We suggest that there is plenty of financial scope within the PSMA funding envelope and the current OS business model to facilitate an open data AddressBase product to deliver an open national address dataset.

We propose that the Ordnance Survey AddressBase Plus solution, together with a free PAF licence, should be made open data under the Open Government Licence to deliver an open national address dataset. We also propose that the National Street Gazetteer, which underpins the current National Address Gazetteer (NAG) should be made open data.

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[22] http://www.ordnancesurvey.co.uk/oswebsite/docs/annual-reports/ordnance-survey-annual-report-and-accounts-2011-12.pdf

How much *should* it cost to deliver an open national address dataset?

Our best estimate, based on the figures we have available, of the full *reasonable* costs of delivering and open national address dataset could be a little as:

- the cost of running the data maintenance functions of the Royal Mail AMU[23] at around £5m p.a.;
- the GeoPlace costs of aggregating Local Land and Property Gazetteers (LLPGs) into the National Land and Property Gazetteer (NLPG) at around £3m p.a.; and,
- OS costs of geocoding (providing a map reference) for new and changed addresses of around £2m p.a.

These estimates indicate that an open national address dataset could be maintained for as little as £10m p.a. A further estimate of costs at £17m p.a. also falls easily within the existing £55m funding envelope provided by government under the current PSMA.

Our research and analysis reveals that there is scope for considerable efficiency in the infrastructure currently in place to deliver the NAG and AddressBase products. ODUG is convinced that an open national address dataset could be provided, at no additional cost, from within existing publicly funded resources. Our estimates indicate that an open national address dataset could be maintained for as little as £10m p.a. A higher estimate of costs at £17m p.a. also falls easily within the existing £55m funding envelope provided by government under the current Public Sector Mapping Agreement (PSMA)[24].

Ownership

Rights Issues

All the data under consideration here is Crown copyright data. Intellectual Property Rights (IPR) in the NAG vest in GeoPlace. The NAG is built using IPR from the Royal Mail Postcode Address File (PAF) which belongs, according to the Postal Services Act 2000 to Royal Mail plc "for the time being". Effectively the ownership of the NAG lies in the hands of agencies which can and do operate as private companies. As a result their obligation is to manage the NAG in order to maximize shareholder value (narrowly defined as maximizing the revenue), rather than maximizing the use of a national address dataset for the more broadly defined public interest of delivering maximum economic benefit. This conflict has been central to disputes over IPR in addresses, and underlying street files, for some 20 years. This is a red herring since the key point is that

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[23] Without the PAF licensing overhead
[24] www.ordnancesurvey.co.uk/psma

the bodies involved are all in public ownership, and the data collected and maintained is funded and owned by the public.

Other issues

National ownership of public address data

As serious issue will arise for the UK as and when the Royal Mail is privatised if the Royal Mail continues to make a claim on the PAF as its 'own' intellectual property to be sold into private ownership in the event of a privatisation. This will put this national core-reference data in private ownership[25], which carries a high level of risk to the UK.

It is our view that trading in core-reference data has proved counter-productive, and that privatising such a right would be very much against the national interest. The Netherlands Government made the mistake of privatising their postal address file along with their Post Office. They soon realized that this was undermining the government's ability to maintain an open national Address and Buildings Register. It took action in the courts to return their postal address file to public control[26].

Royal Mail is likely to argue that the PAF is central to their value as an organisation. We do not concur with this view. In 2011-12 Royal Mail, a £1.5bn publicly owned corporation, made £9.5bn in revenue[27], of which only £27.1m (0.3%) is attributed to the PAF[28]. Royal Mail is regulated to make no more than 10% surplus and the PAF contribution to RM 2011-12 operating profit is £2.6m or 1.2% of realised 2012 profit[29]. We believe that the costs of maintaining and licensing the PAF, currently running at £24.5m per annum, should be reduced by introducing efficiencies and by removing the current licensing regime.

ODUG recommends that the Royal Mail should be relieved of its 'ownership' of the PAF prior to any forthcoming privatisation, and that the delivery and maintenance of the PAF should be carried out by a single body which is entirely responsible for delivering and maintaining a national address dataset as open core-reference data.

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[25] Probably into the hands of a global conglomerate

[26] http://www.prlog.org/11794884-dutch-data-from-the-key-register-of-addresses-and-buildings-bag-now-available-for-re-use.html

[27] www.royalmailgroup.com/sites/default/files/Annual_Report_2012.pdf.

[28] www.pafboard.org.uk/documents/PAF(12)24%20Estimating%20the%20Economic%20Value%20of%20PAF.pdf

[29] £2.6m as a % of £211m 2012 operating profit. Note this is a rather high percentage in comparison with the ROI of the bulk of the Royal Mail's business.

Competing address datasets

GeoPlace aims to exploit the NAG produced commercially, through its relationship with OS, who also benefit. Meanwhile Royal Mail has recently announced its intention to enhance the PAF with a pilot project[30] to produce a geographic coordinate for every postal address in East Anglia and is expected to roll this out more widely. We estimate that the cost of this activity, which replicates data already provided by OS is at least £35m.

Creating competition in the creation of address data is pointless; public bodies are the only ones (so far) who have the resources; scope and reach to produce a national address dataset so, at present, publicly funded or mandated bodies competing with each other is a waste of public money.

ODUG recommends that:

1. *The emphasis needs to shift from creating competition in the creation of addresses to one of creating opportunity in the exploitation, enhancement and innovation in the use of addresses.*
2. *A national address dataset should be set up in a central data repository, as open data, with the data available under the Open Government Licence to all users.*
3. *Oversight and delivery of the open national address dataset should be the responsibility of a single public sector organisation.*
4. *Organisations with the statutory responsibility for creating or modifying address data should each have direct access to the National Address Dataset.*
5. *The rights to this dataset should continue to vest as crown copyright, since all the data contained therein is collected, collated and managed by publicly owned or publicly financed organisations to fulfill their various public tasks and duties.*

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[30] www.royalmail.com/customer-service/pinpoint

Annex D: The benefits of an Open National Address Dataset – thematic

The benefits of an open national address dataset
The creation, implementation and use of an open national address dataset will deliver the following benefits:

Intrinsic:
- A definitive core-reference dataset – removing the potential for duplication and overlap in address data and increasing its overall *quality, reliability and ease of use*.
- Direct *efficiencies in the management, delivery and support* of address data – one central dataset is easier to maintain and update.
- *Protects investment in data collection* – the use of standards will ensure the quality and value of the data are preserved across evolving systems and services.
- *Open data benefits* – providing the ability to access address data for whatever purpose opens up innovation, growth and efficiency opportunities in all sectors.

Transparency and efficiency in public service delivery:
There will be improved efficiency in public service delivery in a number of areas: including savings on the input side, in the creation, management, marketing and distribution of data products, improved transparency and efficiency in the delivery of services to the public and efficiencies in the use of other public datasets.

In the creation of the dataset – rather than multiple public agencies collecting address data, managing changes to addresses and adding enhancements in competition with each other, there will be efficiencies achieved through the definitive management of the collection of the data, which can be collected once and used many times.

In the management of the dataset - again, as for the data collection, one organisation would become responsible for managing the database centrally. At present there are multiple public agencies doing this, resulting in unnecessary publicly funded cost multiples across software, hardware and staff resources. A single dataset is less error prone, allows for more timely data updates and provides a single point of feedback for users.

In the marketing and distribution of products – there are significant costs being expended by public agencies in the creation of multiple competing products and their marketing and distribution.

In the delivery of services to the public – the creation, implementation and use of a national address dataset will make a significant contribution to efficiency and innovation in the delivery services by government departments and in the wider public sector through:

Improving joined-up Government:
- As addresses are created or changed (for example, street re-naming or post code changes) there will be a *single point of entry* onto the shared register thus keeping all bodies as up to date as possible.
- Removing the barrier to the *free exchange of address based information* will support decision making processes and service delivery. For example central government agencies that use addresses in their day-to-day business (such as the Valuation Office Agency and the Land Registry) can exchange them with local authorities.
- *Improved citizen experience* as access to different government services will not require the re-inputting of address information; all public sector bodies work from standard address information.
- Extending '*Tell us Once*'[31]. As people move house there is the potential to tell government only once of a change in address.

Exploiting address data in geospatial and geodemographic analysis:
- The ability to *link geographic and postal addresses* is a key requirement of the national address dataset so address based information can be linked to its geographic location, to improve the analysis of geographic (eg: floods) and demographic (eg: local employment) data.
- Easier *dissemination of information* to the citizen, and commercially, through access to a rapidly growing market for geographic information.

Future proofing:
- New systems introduced throughout the public service will use the agreed, public sector wide addresses including links to a geographic location.

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[31] http://www.direct.gov.uk/en/Nl1/Newsroom/DG_188740?CID=GCR&PLA=url_mon&CRE=death_tuo

Opportunities for innovation and growth:
The creation, implementation and availability of a national address dataset will reduce uncertainty for entrepreneurs, innovators and businesses. This will deliver benefits through:

Efficiency improvements - for organisations who currently expend significant resources cleaning or replicating address data for their own business use.

Reducing risk - providing a definitive dataset, free at the point of use and re-use *lowers the risk* and resources necessary to include national address data in the design and delivery of new products or services.

Delivery time and resource efficiencies - by reducing the number of deliveries, or journeys, which do not reach their intended destination effectively due to poor address/location data. On top of the costs of not arriving on time (or at all) reducing the unnecessary mileage lost (private and commercial) drivers would free up resources for more beneficial use and reduce carbon emissions. Deliveries where a member of the public waits for a delivery which does not arrive on time, or at all carry opportunity costs if that person has taken time off work to await a delivery. According to MoneySupermarket[32] it is possible to get compensation for extra time off work, additional costs, and even inconvenience and distress caused by late delivery problems. Large supermarkets therefore assume a potential annual cost of £100,000s for address data not being up to date. This is based on giving ~£10 to customers who cannot order online groceries, or where a delivery is late due to poor addressing. This baseline figure easily multiply up to £millions of direct costs on businesses. For small companies and tradesmen who need to make deliveries or travel to a particular location the pro-rata impact on their businesses is even more critical.

Increasing business confidence - by delivering definitive and reliable address and geographic information to encourage its use with other datasets and information enabling innovative new products and robust tailored and localised services to be developed and delivered.

Maximising use – there is considerable evidence that the cost and licensing complexity of address data reduces beneficial use. For example in the high-growth mobile location based services sector the providers of in-car navigation systems and street mapping,

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[32] www.moneysavingexpert.com/shopping/delivery-rights

take data which is now free to use (e.g. Bing, Google, Open Street Map) but do not include address information such as property names or numbers even though such information would be very helpful to users and would improve point to point navigation or delivery services. An open national address dataset would ensure maximum beneficial use and drive further growth in this sector.

Annex E: The benefits and costs of an Open National Address Dataset – further analysis

The National Audit Office has noted[33] that the Government cannot maximise the net benefits of transparency without an evaluative framework for measuring the success and value for money of its transparency initiatives. It recommended that government should build on its plans to identify economic and public service benefits and develop:

- A better understanding of the drivers and scale of additional costs of implementing different types of public sector information release;
- Clearer means of determining demand to support objectives of greater accountability, service improvement and economic growth, to prioritise the programme of data release; and
- A structured, objective evaluation of the emerging effects of transparent public data, so that efforts are focused on high-value activities, with unintended consequences mitigated.

In the absence of a standardised evaluation framework, the ODUG has considered the benefits and costs of an open national address dataset under a number of headings, based on the Public Data Group Business Case[34], and its own members experience and expertise in the creation and management of address gazetteers.

BENEFITS

Benefit 1: Reduced duplication

Royal Mail, Ordnance Survey and Local Authorities all collect, manage and distribute addresses. Each, to differing extents, has data collection systems, data creation and database management systems, and resources deployed to manage the products created, and market and distribute the data. ODUG does not have the data to quantify the exact costs involved in these activities, but asserts that it is self evident that there are duplicated costs in the separate systems involved. The following indicators may help to demonstrate the scale of the costs involved:

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[33] "Cross-government review: Implementing transparency" HC1833, 18 April 2012. See http://www.nao.org.uk/publications/1012/implementing_transparency.aspx
[34] Published on MMY web site at http://www.hm-treasury.gov.uk/foi_130212.htm

Data Collection costs

There are approximately 29 million postal addresses in the UK. The Royal Mail has recently announced that it will collect delivery point map coordinates using GPS, and is piloting this in East Anglia. This will require postmen to be given GPS receivers and associated equipment in order to this to a sufficient accuracy. Entry-level equipment of this nature is on the market in the US at $433 each[35], but excludes the associated recording device. A separate estimate suggests that the kit Royal Mail are using for Pinpoint is costing about £1000 per operative and that 700 sets have been purchased.

Collecting 29 million GPS points is not a trivial task, and will take time. If each point were to take 10 minutes (a conservative estimate), then based on the average hourly wage of a postman (approximately £8.00[36]), this would cost £1.33 per point, or £34.6m.

The Royal Mail is not at present proposing to carry out this work across the whole country so these reduced costs need not be included as a benefit at this stage. However, it demonstrates the inefficiency in the situation where competing public bodies are essentially carrying out the same task.

Data updating costs

Addresses change regularly, with new buildings, demolitions and changes of business occupants. Royal Mail alone makes 5,000 changes to address details and business names held within the PAF on a daily basis[37]. This is approximately 4.5% of the total per annum[38]. Even at 4 minutes per address change the cost of keeping the data up to date is of the order of £672k per annum.

Operating costs

Having collected the data it is necessary to hold it in a database, with associated hardware, software and staffing costs. It is likely that these will vary from organisation to organisation, depending upon the legacy systems, processes and procedures. As ODUG does not have these costs to hand estimates have been made, based upon the business case for the Northern Ireland (NI) Pointer national address dataset (estimated

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[35] http://www.amazon.com/Bushnell-Hybrid-Pinseeker-Laser-Rangefinder/dp/B004LY3UV2
[36] http://www.royalmail.com/royal-mail-jobs/working-operations/can-you-deliver-goods
[37] http://www.poweredbypaf.com/end-user/products/postcode-updates/

[38] assumes 250 working days per year.

in 2002). This included the costs of maintaining and operating systems within the Ordnance Survey of Northern Ireland, Royal Mail and the Valuation and Lands Agency, and the costs of maintaining and operating the Common Address File and established the OSNI operating costs at £160k per annum and the Royal Mail costs at £50k per annum. With approximately 1 million addresses in NI, this can be scaled up to estimate the operating cost of for Ordnance Survey/Geoplace at ~16p per address, or £4.16m, and the cost for Royal Mail at £13m.

There will be economies of scale, particularly in hardware and software costs. Scaling up by comparing the size of the business – OSGB is approximately 10 times the size of OSNI and would realise 10x £160k of benefit, or £1.6 m per annum; and if scaled by the same ratio, Royal Mail costs would be £0.5 m per annum.

Marketing and Distribution Costs
Both Royal Mail and Ordnance Survey maintain a marketing and distribution function. Centralising this activity into one organisation would remove duplicate costs, and achieve benefits to the overall cost to these public bodies. Making the data open will reduce these costs further. By utilising pre-existing web portals to make the data available, such as data.gov.uk, it is possible to argue for their complete removal.

In summary our best estimate of the benefits that could be realised through reductions in the costs of compiling, maintaining and delivering address data could be as high as £17 million per annum. Of course, costs of replacing these through one integrated system would have to be applied to the costs side of this analysis (see below).

If it were possible to establish more precisely the costs of data collection, update, data management, marketing and distribution for each organisation it would be possible to arrive at a more realistic estimate of the savings to be achieved by de-duplicating.

Benefit 2: Reduced costs to end-users
Charges
Making the National Address Gazetteer open (i.e. free at the point of use) will have immediate benefit to current commercial users of both the PAF and OS AddressBase products. Further benefits arise through the re use of such savings by the organisations concerned into further product development activity, and the consequent benefit to these organisations bottom line, and increased tax revenues to the Exchequer. These savings would be balanced by the cost side of the analysis (see costs section below).

Complex licensing

A review of the AddressBase licensing terms suggests that the current licensing regime is complex and restricts usage, creating both direct and indirect financial burdens on private sector companies, requiring them to spend time resolving complex licensing issues and providing information about anticipated usage, which it is not always easy to predict. Users have difficulties understanding licences and derived data issues, creating uncertainty around these matters, which in turn inhibits innovation.

There will be further savings available to these organisations from removal of having to deal with complex licensing arrangements by each, and the need to consult with the licensing organisation separately if a new use for the address data is contemplated. However, without the relevant information (for example the number of commercial customers for OS and Royal Mail products) it is difficult to even estimate this.

Quality and confusion and multiple addresses

There is evidence of quality issues between the PAF and OS data. OS not only collect additional information, but also correct identified the PAF issues.

There is also some evidence that licensing and charging is a barrier to use; it is therefore possible that a number of users utilise their own address databases collected through customer supplied data, rather than have to pay and comply with OS or Royal Mail terms. By having a single definitive address data base this would no longer be necessary.

The efficiency gains throughout the public and private sector from having the one single definitive version of every address is difficult to quantify, but the example used in the Pointer Business case (the address file for NI) found that in 2002 over 200 different address databases were found to be in existence in NI alone. It would not be surprising to discover a similar level of usage of 'informal' address databases not only in the public sector, but also in the private sector.

Benefit 3: The growth argument

The Public Data Group (PDG) Business Case[39] recognised that forecasting the net value – especially the growth potential – of open data is not an easy task due to the wide range

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[39] Published on MMY web site at http://www.hm-treasury.gov.uk/foi_130212.htm

of estimates. The Office of Fair Trading (OfT) estimate of net value (£590m annually) was constrained by unduly high pricing (of existing products), restrictions in downstream pricing and failures to exploit public sector information, which if resolved could generate a total net value of £1.1 billion. The Government's estimate of the value of public sector information to the UK economy in 2011 is reported as being £16bn.

The National Audit Office has also stated that estimates of additional value are based on highly uncertain assumptions about usage, demand and impacts on the wider economy. In its recent report[40] on Transparency the NAO concludes that Government's ability to maximise economic growth from traded data is constrained by current charging and licensing arrangements, and recognises the limited understanding of potential benefits. It also noted that the business case for the releases of free data announced in the Autumn Statement 2011 estimates net benefits of £49m over 20 years.

The PDG Business case did not make the case for an open national address dataset. Identifying the full economic potential of a national address dataset is therefore as difficult as any other open data proposal. However, the importance of addresses is recognised in this business case. It included steps to be taken to improve accessibility, including the release of postcode information, and the ability to freely test, evaluate and develop new products based on the NAG, as well as asking OS and the Royal Mail to improve licence terms for development and testing, and providing greater support and ease access for developers and innovators and both Companies House and Land Registry address based data were included.

Ordnance Survey has recently concluded a study into the impact of OS Open Data. It is understood that this report demonstrates a net benefit. However, OS has not yet made it publicly available, and will present it first to the Data Strategy Board.

In the absence of hard evidence of how the release of open data drives growth in the economy we are left with the intuitive assumption that it must. However, there are recent indicators from related activity that may help support this intuition until such time as further evidence emerges.

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[40] "Cross-government review: Implementing transparency" HC1833, 18 April 2012. See
http://www.nao.org.uk/publications/1012/implementing_transparency.aspx

o The benefits from open data are already being felt by the public sector in Great Britain. The Public Service Mapping Agreement (PSMA) has removed barriers to use by the public sector across the UK. For example, West Devon District Council "Really appreciates the shorter contractor / end user licence forms." The Mersey Forest has stated: "without PSMA the Mersey Forest wouldn't have been able to afford the data to do all the innovative GIS work". More significantly than these anecdotes (quoted in a PSMA marketing sheet) has been the exponential growth in public sector users of OS data since April 2011 - there are now over 2,500 members of the PSMA, from a base membership on 1 April 2011 of 577.

o At a recent conference, the use of OS data in the Olympics was presented by Transport for London (TfL). Extensive use was made of data collected from OS maps, positioning a range of information about Olympic lanes, temporary road closures, venues and so on. It was noted by the presenters that OS gave an exemption to its usual restriction on the release of data derived from its own information. TfL put the data derived in this way onto its web site, which resulted in over 700 downloads over a few weeks. Many of these reuses are still unknown, but it this is a good indicator of the potential for increased use of OS data when it is made freely open, without restriction.

o Even if some very prudent assumptions were made about the take up by the private sector of open address data, it can be assumed that growth is highly probable.

o Tangible savings have also been identified: OS has identified that central and local government, NHS organisations, emergency services and parish, town and community councils achieved savings of more than £18m last year as a result of PSMA. The range of benefits of opening up data to the public sector in this way are set out in further detail on the PSMA web site.[41]

Benefit 4: Wider social benefits

Wider social benefits arise from the ability of society as a whole to have a single, authoritative address register. The benefits arise from a number of perspectives:

For the individual citizen:

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[41] www.ordnancesurvey.co.uk/psma

- Being able to identify and unambiguously search local and central government registers for information related to the address or the locality.
- 'Tell government once' about a change of address. This is potentially extendable to private sector organisations too, for instance telecoms and utilities suppliers and insurance companies.
- Being able to assess availability of local services, schools, health centres, hospitals etc.
- Improved point to point navigation.

For many citizens problems can arise at the start of an address cycles when occupying a different property. New owners can be denied access to services because their address is not unambiguously recorded. Maintaining a single national address dataset allows all officially used addresses to be maintained and corrected in a single place, from pre-build onward.

For the government and public service providers:
- All the benefits of the Transparency Agenda are significantly enhanced by the ability to cross reference government data to a locality through an address; a single definitive national address register will enhance this.
- If all of the government uses the same address register the services and benefits used by occupants can more easily cross referenced, making it easier to identify who needs and uses which services, also improving the potential to detect fraud.
- A national address register would enhance the electoral register and has the potential to be used for the further development of parliamentary and other administrative boundaries.
- More accurate emergency service provision.

For the corporate sector:
- More accurate delivery services.
- Knowing where people are located also helps corporate tailor a customer offering, knowing where people who are not your current customers are is also extremely valuable.
- Based on the results of recent government run 'hackdays' access to a single definitive national address register is likely to drive further interesting applications of advantage to society. The development of location based applications of a social and local nature will be able to blossom.

For charity and third sectors:

- Charities working locally will be able to improve their services and to identify where new services are required.

COSTS

Determining the exact costs is challenging due to a lack of publicly available information about Trading Fund costs, disaggregated by product or dataset. Any requests under the Freedom of Information Act (FOIA) are declined on the grounds of commercial confidentiality. Any reports that are available publicly have the important cost information redacted.

This may be understandable viewed from the Trading Fund perspective, but there is a wider public interest case that cross-government a number of public bodies are essentially carrying out very similar activities; hence there is a duplication of effort from the whole of government perspective. Furthermore, each Trading Fund estimates the potential from such activities to grow their revenues further, making estimates for future growth their business, and yet are in potential competition with other public bodies.

Costs 1: Revenue Loss to the organisations involved

The first broad area of cost is the loss of revenue to the body currently providing the information. As noted earlier in the benefits section (Benefit 2: Reduced Costs to end-users) these costs would have an equal and opposite effect to the reduced costs to end-users.

Revenues generated by these products are not currently available to ODUG. But we can make certain deductions from publicly available information which evidence that the costs are easily bearable by the organisations concerned, without the need for additional funding.

We expect Royal Mail to argue that the PAF is central to their value as an organisation. We do not concur with this view. In 2011-12 Royal Mail, a £1.5bn publicly owned corporation, made £9.5bn in revenue, of which only £30m (0.3%) is attributed to the PAF; since Royal Mail is regulated to make no more than 10% surplus – thus limiting the PAF's contribution to Royal Mail's 2011-12 operating profit to 0.2%.

Ordnance Survey itself acknowledges in its 2011-12 Annual Report that, 'the increase of £11.2m in trading revenue is principally as a result of the 1 April 2011 commencement

of the PSMA,' money which flows into OS regardless of how many PSMA users there are. So we believe that OS could deliver an open data AddressBase dataset, as part of its open data commitments, without undue financial detriment to its business.

We can also evidence room for manoeuvre within OS's current financial remit. In the 2011-12 Annual Report[42] £86m (62%) of the revenue of £139m came from the government, including £55m to deliver the PSMA. OS clearly has a strong high-end business delivering value-add products to the private sector where revenues for the year remained stable at £53m, 'due to growth in new markets offsetting the continued effect of product substitution following the 2010 launch of OS OpenData'. OS, a Trading Fund, has a Return on Capital Employed (ROCE) target of at least 6.5% set by the Treasury. Its operating surplus for 2011-12 was 26%. We suggest that there is plenty of financial slack within the PSMA funding envelope and the current OS business model to facilitate an open data AddressBase product to deliver an open national address dataset.

Costs 2: A single system

The benefits analysis suggested the removal of duplicated costs. However, they are not entirely removed, as there is still the requirement for one body to collect, maintain, manage and distribute a national address dataset. It is possible to estimate what these costs might be. However, it may not be appropriate to entirely rely upon the data provided by either OS or the Royal mail, given their extensive reliance on legacy systems, processes and procedures. A ground-up analysis of the requirement, from a blank sheet may be appropriate. Using the NI Pointer Business case, estimates, (albeit from 2002) were that the overall annual costs of the preferred option of creating a single, definitive address database, with a unified data collection, management and distribution system was of the order of £210k - £250k per annum.

Costs 3: Loss of future revenue potential

There is an argument that opening the National Address Gazetteer reduces future revenue generating capacity in the bodies currently creating competing address products. This argument holds only if considered within the narrow terms of the bodies concerned. As the NAG will be freely available to all, including for these bodies to exploit and innovate themselves, albeit now in competition with others, that revenue generating potential still exists. The future revenue generating prospects of each organisation should not be modeled as a cost to the whole system.

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[42] http://www.royalmailgroup.com/sites/default/files/Annual_Report_2012.pdf

Annex F: Risks

NAO identified that government faced certain risks when implementing transparency:

- Risks to privacy when information is provided at more granular levels. Departments have conducted privacy risk assessments where they saw privacy as an issue. More generally, the Government commissioned an independent review to consider how transparency can proceed while privacy is protected. The Cabinet Office intends to respond to its recommendations in a forthcoming White Paper;

- Fraud risks with increased transparency around contracts and payment details – fraud attempts to a value of £7 million directly related to transparency releases have been found in local government, highlighting the need for effective anti-fraud measures; and

- Other potential unintended consequences of transparency. Given the breadth of information released as part of the transparency agenda, it is likely that wider unintended consequences might result, but the Government has done little to identify these.

None of these risks will be increased through the release of an open national address dataset.