Open Data User Group (ODUG)
Code-Point with Polygons
July 2013

Name of dataset: Ordnance Survey Code-Point with Polygons

Summary
A number of ODUG data requests have requested access to postcode related data, including a number of specific requests for Code-Point with Polygons, a product maintained and sold by the Ordnance Survey (OS).

OS already releases Code-Point Open, a dataset which includes a single point location for each postcode boundary as Open Data under an OS Open Data License. Code-Point with Polygons extends this dataset to include the boundary of each postcode area.

The Ordnance Survey, a number of their partners, independent SME's and data request individuals have been consulted as part of developing this benefits case. Commercial interests in the provision of this data were cited by stakeholders as the reason they could not provide ODUG with the estimated cost of providing Code-Point Open with Polygons as an Open Data. So this report does not include:

- The cost of manufacturing and maintaining Code-Point with Polygons, carried out by a 3rd party under contract to the Ordnance Survey.
- Current revenues generated from the sale of Code-Point with Polygons, and the mix of how the data is licensed. All OS licenses apply, only the terminal licensing price is publicly available.[1]

In the case of potential commercial users of this data the data requests are private – ODUG allows this to protect the commercial interests of pre-revenue start-up organisations.

Code-Point Open
Code-Point Open is already released under the Ordnance Survey Open Data License, demonstrating the value of release. Since release Code-Point Open has been incorporated into a wide range of solutions, for example it is referenced as a datasource in the TomTom navigation .

Code-Point Open defines the location of the 'point' as "The point is given the ADDRESS-POINT® coordinates of the nearest delivery point to the calculated mean position of the delivery points in the unit."

This means the point is based on the clustering of all points within the areas and therefore will not represent outliers or the 'catchment of all postcodes'. However, Code-Point Open does not provide the catchment of all Address Point locations with a common postcode Unit.
There are extensive use-cases for postcode boundaries:

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[1] See Annex A

Benefits of Open Release

- The Ordnance Survey outlines a range of example use-cases on their website.
    - Market analysis and profiling
    - Statistical analysis
    - Crime pattern analysis
    - Health/Epidemiology profiling
    - Resource allocation
    - Sales targeting

- Limited Competition
  Code-Point with Polygons is created from OS Address Point under license. In order to create this dataset a full commercial license of Address Point is required, that license would still limit onward sale and derivation.

  Examples of alternative products do exists, these are usually derived from Code-Point Open, but do not provide a unit level representation.

  In the absence of an Open Licensed address point level dataset (OS Address Base, NAG, or PAF with coordinates) releasing Code-Point with Polygons will provide a method of use that cannot be replicated any other way.

- Application to Mobile Applications and Services
  Mobile devices have seen an explosion in the use of location based servics. These services commonly require a conversion from a coordinate to an address, so a search for local services can be carried out. This process of converting a coordinate to an address is referred to as 'reverse geocoding'.

  Code Point Open does not provide a reliable way of assigning the correct Postcode Unit. Code-Point with Polygons, does provide a method of associating a coordinate with a Postcode Unit. This is the foundation of many reverse-geocoding services.

- Activities associated with Navigation
  TomTom refers to Code-Point Open in its copyrights statement, indicating that at some level the data is used either directly or as part of a process to enrich data used in TomTom navigation devices. When finding a location in the UK the postcode is the usual default reference over town, street and number. Code-Point Open is used to quickly narrow down the address search. Access to Code-Point with Polygons would further supplement these services by giving greater insight into the distribution of addresses within a postcode Unit.

- Transparency in service provision
  Currently Postcode boundaries are available to organisations that pay for them, however it is not clear to the consumers or consumer groups how these boundaries are determined.

Transparency in these boundaries will assist in the general public better understanding how and why business and service level decisions are made.

Code-Point with Polygons is essential for site catchment and site planning analysis. Essentially the technique of determining the customer demographic in an area, and the effect that demographic has on a retail or service delivery location.

Government and Commercial services are referenced based on Postcode. For public services such as Schools, Doctors, Libraries, Recycling and Waste services requests generally require a postcode either to discover, or to enable access to the service. Commercial services such as insurance, broadband, cable, phone, gas, electricity, etc use Postcode to determine the service levels offered. This leads to a range of examples where 'postcode lotteries' for services result due to the segmentation of services by postcode, rather than administration boundary. Examples can be found in Schools, Health, Insurance and Communications.

- Postal delivery or targeting
  Any services that require a catchment of potential customers, individuals to visit, or for communications to be delivered to a group of households will benefit from Code-Point with Polygons. These scenarios include:
    - Determining the catchment for new retail premises, assisting in determining the catchment, and associated demographics.
    - Building mailing lists to communicate relevant and targeted postal communications.
    - For planning service delivery including energy, communications and social services.

Risks and concerns around open release
- Direct Revenue
  The Ordnance Survey receives revenue for selling Code-Point with Polygons. The amount of revenue received is not public record.

- Indirect Revenue
  A number of partners receive margin from Ordnance Survey which would be affected by public release. In all cases the impact was referred to as 'minor or small'.

- Cost of maintenance
  The cost of maintenance will not be affected, the process to generate Code-Point with Polygons is well understood and the contract to maintain the data is outsourced by the Ordnance Survey to a third party. The costs of maintenance are not public record.

  The Ordnance Survey already have mechanisms in place for the dissemination of Open Data, so the additional costs of supply would be a minor increment based on services already supplied.

- Personal Information and privacy
  Code-Point with Polygons does not include personally identifiable information.

- Appropriate Use
  A number of organisations highlighted that Code-Point with Polygons is a derived dataset, and has been used in scenarios where administration boundaries would be more appropriate.

Observations

This section captures a number of points raised and details common themes that were discussed in interviews carried out as part of this work.

- Fees and Licensing
  Licensing, the fees are not transparent beyond terminal level pricing. Generally it was highlighted the cost was not a limiting factor, the additional terms were of more concern. Code-Point with Polygons has the same terms applied with respect to derivation and use as other OS products. During interviews with partners and end users, the derivation terms were highlighted as limiting factors of use.

  It was also discussed that access to Code-Point Open and the licensing under OS Open Data terms has resulted in Code-Point Open being used in preference to Code-Point with Polygons.
  This is further reinforced by organisations offering derivations from Code-Point Open to emulate Code-Point with Polygons.

- Authoritative sources
  Postal Boundaries are artificial features created from a process of deriving an area from Address Point level data. Code-Point with Polygons or an equivalent dataset can only be derived from a complete National point level address dataset.

  As such only organisations that own a commercial license, and who can supply a derived dataset under reasonable terms can create an equivalent product.

- Admin and Postal Alignment
  Postal Boundaries do not align with Administration boundaries, there are examples where postcode boundaries span national borders, and it is more common for them to span county and ward level features.

  Postcodes are used in preference to an administration boundary as end users are more familiar with their day-to-day use. It is very unlikely that users know their Lower Super Output Area code from the ONS Boundaries.

In a number of cases examples of where postal data is being used 'incorrectly' were outlined. The examples fell into 2 categories; Organisations using Code-Point Open, where Code-Point with Polygons would assist, especially in cases where derivations are being constructed directly from Code-Point Open; Organisations using postcodes where administration areas would be more appropriate, for example in indicating public services and government services which are aligned with administration boundaries rather than postal boundaries.

Key Benefits

Rates data release goals in the scope of ODUG key benefit areas.

	1	2	3	4	5
Efficiency				X	
Environmental		X			
Growth			X		
Social				X	
Transparency		X			

Data Theme Fit

Rates the Data Request in relation to the key themes identified by ODUG.

	1	2	3	4	5	6	7	8	9	10
Land and Property								X		
Environment				X						
Social								X		
Orgs and Companies							X			
Education								X		
Transport									X	
Financial					X					
Health						X				

ANNEX A – CODE-POINT WITH POLYGNOS

Code-Point with Polygons represents collections of postcodes down to unit level.
For example, the full unit postcode for the ODI is EC2A 4JE
65 Clifton Street, London EC2A 4JE

Code-Point Polygons are built using Thiessen and Voronoi algorithms from the underlying address point locations.
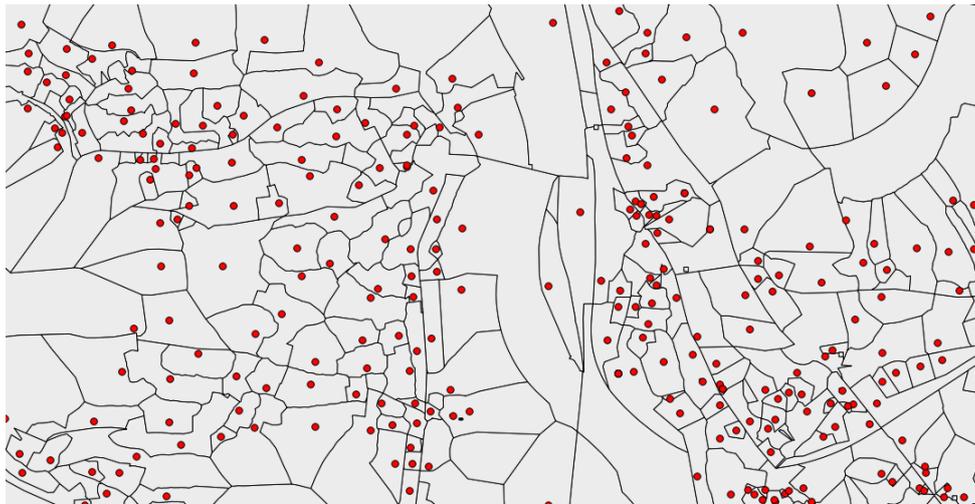http://en.wikipedia.org/wiki/Voronoi_diagram

Image 1: Code-Point Open and Code-Point with Polygons.
Sample data supplied by the Ordnance Survey

As can be seen in image 1, the red points (Code-Point Open) represent an arbitrary location within the area (Code-Point Polygons). Observe how in many cases the point is not located in the center of the Code-Point Polygon, but is on the edge, or to one side. This is less significant when the polygons are very small, but emphasised significantly for larger areas.

Code-Point with Polygons is a Product from the Ordnance Survey published under the OS OpenData Licence, and Commercial License.

Data.gov Code-Point listings. (UK Location Programme)
http://data.gov.uk/data/search?q=Code-Point
Code-Point provides a precise geographical location for each postcode unit in the United Kingdom. It also contains additional information, for example, PO boxes and the total number of addresses, both domestic and non-domestic, in each postcode unit.
Code-Point includes Gridlink® data. Gridlink is a consortium initiative involving a number of government agencies that have cooperated to improve the consistency and quality of spatially referenced, postcode-based data.

Commercial License

http://www.ordnancesurvey.co.uk/oswebsite/licensing/index.html

Code-Point Open (UK Location Programme)

http://data.gov.uk/dataset/code-point-open

Code-Point Open is a dataset that contains postcode units, each of which have a precise geographical location. There are approximately 1.7 million postcode units in England, Scotland and Wales. Each postcode unit, such as KY12 8UP or PO14 2RS, contains an average of fifteen adjoining addresses. Northern Ireland postcodes are not available with Code-Point Open.

OS OpenData License

http://www.ordnancesurvey.co.uk/docs/licences/os-opendata-licence.pdf

Code-Point with Polygons

http://data.gov.uk/dataset/code-point-with-polygons

Code-Point® with polygons contains postcode boundaries for Great Britain.

These show the extent of each postcode unit, enabling you to analyse information by postcode.

Ideal for activities such as sales targeting or market profiling, as well as any statistical work.

Commercial Licenses

http://www.ordnancesurvey.co.uk/oswebsite/licensing/index.html

http://data.gov.uk/forum/general-discussion/Code-Point-open-and-postboxes

Pricing

Only terminal licensing is published into the public domain. The additional pertner, reuser and derivation licensing is commercially confidential. Ordnance Survey offers parters discount on sales, and as such this limits availability of this information.

This licensing is for internal business use only.

Code-Point with polygons - Licensed for Great Britain only.

No of terminals	Licence fee
101+	£26,342.50
51 to 100	£23,708.25
21 to 50	£21,074.00
11 to 20	£15,805.50
6 to 10	£11,854.13
3 to 5	£7,902.75
2	£5,268.50
1	£3,292.81

References:

[1] OS Code-Point Open
http://data.gov.uk/dataset/code-point-open

[2] ONS Boundary Layers
http://www.ons.gov.uk/ons/guide-method/geography/products/digital-boundaries/index.html

[3] Gov.UK
https://www.gov.uk/search?q=EC2A+4JE

[4] Police.UK for a given Postcode
http://www.police.uk/overview/?q=London+Borough+of+Hackney%2C+London+EC2A+4JE%2C+UK

[5] Alternatives
http://www.geoplan.com/Mapping_Solutions/GIS_Mapping_Data/Postcode_Unit_Boundaries

[6] TomTom Copyright declarations in regard to Code-Point Open Copyrights
http://www.tomtom.com/lib/img/us/legal/Copyrights_en_us_July_2011.pdf

[7] Postcode Lottery
http://en.wikipedia.org/wiki/Postcode_lottery

[8] Postcode Lottery - Education
http://www.guardian.co.uk/education/2008/may/23/schooladmissions.schools1
http://www.telegraph.co.uk/finance/personalfinance/2805548/Investing-against-the-school-postcode-lottery.html

[9] Postcode Lottery - Insurance
http://www.thisismoney.co.uk/money/cars/article-2105842/End-car-insurance-postcode-lottery-future-cut-costs.html

[10] Postcode Lottery - Healthcare
http://www.telegraph.co.uk/health/2700686/Healthcare-postcode-lottery-means-patients-losing-out-on-cancer-treatments.html