

# Assessing the Value of OS OpenData™ to the Economy of Great Britain - Synopsis

**A synopsis of the Full Study Interim Report prepared for Department of Business, Innovation and Skill by ConsultingWhere Limited and ACIL Tasman.**

**The synopsis has been authored by John Carpenter and Phil Watts of Ordnance Survey**

OS OpenData Economic Value Study

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## Preface

An independent Study “*Assessing the Value of Ordnance Survey OpenData (OS OpenData™) to the Economy of Great Britain*” was commissioned by Ordnance Survey on behalf of the UK Government from ConsultingWhere Limited and ACIL Tasman.

In conducting the analysis summarised in this report, the consultants (ConsultingWhere and ACIL Tasman) have endeavoured to use what they consider is the best information available at the date of publication, including information supplied by Ordnance Survey. Unless stated otherwise, ConsultingWhere and ACIL Tasman do not warrant the accuracy of any forecast or prediction in the report. Although ConsultingWhere and ACIL Tasman exercised reasonable care when making forecasts or predictions, factors in the process, such as future market behaviour, are inherently uncertain and cannot be forecast or predicted reliably.

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The case study material included in the interim full report is, in many instances, highly commercially sensitive. ConsultingWhere Limited and ACIL Tasman have given assurances to these organisations regarding confidentiality.

To ensure that such confidentiality is maintained and that readers may not infer company and individual names from the detail of the full report, this synopsis of the report’s approach, methodologies, headline analysis and conclusions and recommendations has been prepared to support wider dissemination of the messages from the Assessment.

Following compilation of the detailed workings, the Chief Analyst of BIS was asked to assess the work. The letter, giving her views on the methodology and validity of the findings, can be found in Appendix C

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# 1 Introduction

## 1.1 OS OpenData™

OS OpenData is a portfolio of eleven Ordnance Survey digital datasets of Great Britain. These were made available for free use and re-use by all, including commercially, from 1 April 2010. The data is delivered through an OS OpenData portal operated by Ordnance Survey, and this enables users to view maps and boundary information and download datasets direct to their computer, including for use in web-based mapping applications via the OS OpenSpace® API.

The datasets comprise:

- 1:10,000 scale OS Street-View®;
- Meridian™2; Strategi®;
- OS VectorMap® District;
- 1:250,000 Scale Colour Raster: and,
- MiniScale® topographic mapping datasets;
- Land-Form PANORAMA® height and terrain data;
- OS Locator™ and 1:50,000 Scale Gazetteer, gazetteer products;
- Boundary-Line™ electoral and administrative boundaries; and,
- Code-Point® Open address location data.

The data was made available in response to a Government initiative aligned to increasing transparency and stimulating innovation and the digital economy.

## 1.2 The Study

Ordnance Survey commissioned ConsultingWhere and ACIL Tasman on behalf of the Department for Business, Innovation and Skills to undertake a research study to evaluate the economic impacts, success or otherwise and benefits of OS OpenData and to inform any future developments relating to open data from Ordnance Survey. The research for the report was conducted between March 2011 and March 2012 – effectively the second full year of OS OpenData availability. All projections and forecasts were ‘benchmarked’ to 30<sup>th</sup> June 2011.

## 2 Economic modelling and survey work

### 2.1 Economic modelling

The purpose of the Study was to evaluate the impact of the release of OS OpenData in economic terms. The study focused on private and third sector impacts. The presence of the Public Sector Mapping Agreement, which makes all Ordnance Survey datasets to all central and local government, health and similar bodies, masks a meaningful analysis of public sector impacts.

The Study used ACIL Tasman's *Tasman Global* Computable General Equilibrium (CGE) model to assess the economic value arising from the release of OS OpenData. It predicts a new equilibrium in the overall economy arising from changes in a range of sectors, and provides a framework for consideration of the "counterfactual" – testing the economic value that might otherwise have been achieved by using alternative technologies or business models than releasing OS OpenData for free re-use. The particular version of CGE used is able to take into account trade flows with other countries as well as resource shifts within Great Britain.

The CGE model was also chosen as it overcomes problems with simple benefit / multiplier approaches. The model also allows analysis of changes in macro-economic aggregates resulting from task-related changes to e.g.: Gross Domestic Product, income, investment, wages and employment, as well as enabling a view of potential changes to government revenues from taxation and other sources.

In the study the economic outcomes resulting from OS OpenData release were used as the 'reference case' and were compared with a no-change continuation of previous pricing and licensing arrangements as the 'counterfactual'.

The Tasman Global CGE model builds on a Global Trade Analysis (GTAP) database (2008) developed by Purdue University, USA, and adds population and labour market dynamics, technology representation within key industries and the ability to repatriate labour and capital income as well as a detailed emissions abatement framework. The database used was disaggregated to enable separate identification of Great Britain from the United Kingdom using key statistical information published by Office for National Statistics.

A "bottom-up" technique was used for the inputs to the study based upon case studies and market intelligence which have been cross checked with information provided by Ordnance Survey and publicly available market statistics. Since, with the exception of OS VectorMap District, the OS OpenData products were already available prior to launch the analysis focused on:

- Costs and savings at Ordnance Survey related to releasing and disseminating open data;
- Costs and benefits among users in accessing and using the products;
- Wider economic and social impacts resulting from the release of OS OpenData.

Given that the experience of previous studies has indicated the greater difficulty in identifying benefits than costs, the study adopted a considered but cautious approach, and chose not to include wider social welfare benefits within the CGE model, but to present these qualitatively.

Due consideration was given to evaluating changes to the supply chain, using the approach outlined in the European Union MEPSIR study<sup>1</sup>, including the effects of, and on:

1. **Direct price** – related to the reduced costs of purchasing public sector information;
2. **Downstream price** – the potential for consequential reductions in prices farther down the chain as a result of decreased costs of information;
3. **Quantity** – the potential for increased acquisition and use due to easier and cheaper information;
4. **Entry** – the potential increase in businesses entering the value chain due to the removal of ‘exclusivity’;
5. **Diversification** – the creation and entry to market of new and diversified products and services enabled by the lower costs of information;
6. **Quality** – new entrants driving higher quality from pre-existing suppliers;
7. **Elimination** – the value-adding basis of some parts of the value chain may cease to exist;
8. **Competition** – national competitive strength will increase leading to increased exports;
9. **Income** – cash streams to government agencies selling the information will decrease;
10. **Revenue** – tax revenues to government will increase as economic activity is stimulated by the reduced costs of information.

## 2.2 Approach

The Study was conducted in stages to mitigate concerns that the timing, one year on from release of OS OpenData, would mean that impacts had not yet emerged sufficiently. These stages were:

- 1A – Feasibility: to establish whether sources of evidence were sufficient and robust;
- 1B – Independent Assessment: a peer review by independent economists to validate the approach being taken;
- 2A – Full Study Interim Report: an interim report on the full study, building on 1A into a broader variety of sectors and taking on board the comments from the stage 1B review;
- 2B – The planned Final Report – this was intended to be a summary of the findings that would be drafted so as to be accessible to a wider audience and to enable the further updating of conclusions through wider consultation. This stage has been superseded by this Synopsis of the Interim Report.

The study involved the following activities:

- **Literature review:** of economic value studies on public sector information in Australia, Canada, the EU, New Zealand and USA;

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<sup>1</sup> Executive summary of MEPSIR report:

[http://ec.europa.eu/information\\_society/policy/psi/docs/pdfs/mepsir/executive\\_summary.pdf](http://ec.europa.eu/information_society/policy/psi/docs/pdfs/mepsir/executive_summary.pdf)

- **Candidate case studies:** consisting of users with potential or actual strong business cases of innovative applications and new efficiencies through using OS OpenData;
- **Market sector identification:** using previous consultancy reports and Standard Industry Classifications<sup>2</sup>;
- **Interviews:** with over 100 individuals;
- **Net benefits:** assessed from the interviews to provide initial estimates for each business of value ranges for ultimate market size (turnover) from consequential new products, services and efficiencies;
- **Download analysis:** of data volumes and numbers from the OS OpenData portal, by market sector , to assess adoption rates and impacts in sectors with no suitable case studies;
- **Adoption rates:** estimated over a five year period to 2016, assessed from analysis of data downloads over the period April 2010 to January 2012;
- **Impact calculation:** calculating resultant impacts to sectors and sub sectors illustrated by the case studies, including value chain knock-on effects where feasible;
- **CGE Modelling:** using the impact analysis aggregated to the GB level as input to the Tasman Global CGE model;
- **Economic assessment:** developed from outputs from the Tasman Global model and interpreted by ACIL Tasman's economists;
- **Report:** the write-up and presentation of the findings and recommendations.

## 2.3 Independent economic review

The feasibility study was reviewed by independent economic consultants Prahbat Vaze and Patricia Seex, who are both members of the Advisory Panel on Public Sector Information. They confirmed the validity of the methodology for this Study and made recommendations on improvements to enhance the study. The sections headed in bold text below paraphrase relevant extracts from the report, whilst the italicised text that follows describes how the study addresses the recommendations:

- **Case studies:** A “bottom up” approach building on case studies of users of OS OpenData was conservative and hence unlikely to overstate impacts;
- **Analytical consultancies:** There would be merit in wider engagement with analytical consultants who provide analytical services to certain types of medium sized businesses to inform evidence of changes in spending or analytical services provisions;

*In response, the consultants did attempt to interview both of the major players cited. In one case without success in terms of financial evaluation but in the other case, we were able to get an economic assessment, albeit non-attributable.*

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<sup>2</sup> Standard Industry Classification (SIC) – is the standard method used by the Office for National Statistics (ONS) for classifying industrial activities into a common structure.



- **Price discrimination:** The full study needed to seek evidence of any price discrimination in Public Sector Information (PSI) that would indicate trends towards more informed and focused acquisition of premium products through use of OS OpenData;

*Two case studies were added as examples of price discrimination in services offering the embedding of OS OpenData.*

- **Data warehouse businesses:** There would be merit in a carefully structured approach to interviews with multi-national location information providers and large-scale data warehouse businesses to reflect their capability for greater levels of innovation and multi-national sourcing of location information;

*Such interviews were conducted by the consultants, in all cases they were unwilling to discuss financial impacts but comment is included in this synopsis.*

- **Grossing up for sector level estimations:** There should be greater clarity on how estimates were derived and evidence of sensitivity analyses on those assumptions, or that ranges should be provided for sector level and total economic impacts according to the assumptions used;

*The assumptions on which the grossing up of figures for each sector are based were explicitly defined in the study.*

- **CGE modelling using the GTAP model:** More evidence was required on the suitability of GTAP in modelling PSI impacts, including evidence from other methodology verification research;

*This is addressed in the Conclusions.*

- **Comparisons with the 'Cambridge' study:** There would be merit in seeking comment on the Study methodology and findings from the Cambridge researchers.

*The publication of this synopsis will facilitate that process.*

## 2.4 Literature review

There is extensive economic literature on pricing policies for public sector information and their implications for economic welfare and equity. The central concern of economists is the impact of different pricing policies on maximising economic welfare.

**Pricing Policy** was reviewed by reference to:

- **The Cambridge Study [Rufus Pollock, 2008]:** which used welfare analysis based upon partial equilibrium analysis, and a "willingness to pay" approach, with the application of a multiplier to address the limitations of this approach, and a discount factor to model the delay in delivery of benefits;

- **The Oxford Economic Associates Ltd (Oxera) Study [Oxera, 1999]:** which estimated the economic contribution to the national economy of Ordnance Survey's products and services. The report examined social gains resulting from the use of Ordnance Survey information and follows with a high level value added approach to estimating economic contribution by sector. This is aggregated to produce an overall estimate of national value linked to sectoral dependency on Ordnance Survey products. The adopted methodology is acknowledged by Oxera to be inferior to a "willingness to pay" analysis;
- **Economic Assessment of Spatial Information Pricing and Access [PriceWaterhouseCoopers (PwC) for Australian and New Zealand Land Information Council (ANZLIC), 2010]:** being an analysis of economic impacts of different pricing policies using a "willingness to pay" framework but including dynamic modelling of efficiency aspects of changes in competition and innovation over time. Elasticity of demand estimates were calculated for three pricing scenarios.

**Public Sector Information Re-use** implications were reviewed by reference to:

- **The Power of Information [Mayo and Steinberg, 2007]:** considered the emerging opportunities for creation, consumption and re-use of public sector information (PSI) in knowledge-based economies, and argued for new Government strategies to enable the opportunities to be grasped;
- **Measuring European Union Public Sector Information Resources (MEPSIR) [Dekkers, Mark et al, European Commission, 2006]:** which estimated the size of the PSI market within the EU, and analysed the degree to which the aims of the European PSI Directive had been realised in practice;
- **Pricing of Public Sector Information Study [Vries, Mark et al, European Commission, 2011]:** This included an analysis of several OpenData portals across Europe. It concluded that the measurable economic benefit to date was limited, but the potential indirect benefits to stimulate innovation did exist;
- **Review of recent studies on PSI re-use and related market developments [Vickery, 2011]:** No new research was undertaken and the study concluded that the benefits of opening up public sector information were substantial, but cautioned on the range of methodologies and sources used in these studies;
- **The re-use of public sector information: an economic optimal pricing model [Penin, Julien et al, 2011]:** Often referred to as "The Strasbourg Study" this academic paper concluded that many of the existing studies took a very simplistic approach to calculating the benefits of open data and overstated the economic impact. It proposed that in a period of restricted budgets for data producers, many of the economic benefits of greater data usage would still be achieved as long as charges reflected the users willingness to pay;
- **Costs and benefits of Data Provision (Australia) [Houghton, 2011]:** Uses a similar approach to this study and includes an analysis of the economic benefits of Geoscience Australia's OpenData initiative, although based principally on the increase in downloads and drawing assumptions from this. It estimated an increase (including social benefits) of AU\$15million annually.

These studies show that in varying degrees that the economic benefits of data reuse exceed the loss of government revenue. Therefore the business case for open data would appear to be clear. However, what is not evaluated is the effect of a gradual degrading of public sector information if governments do not continue to fund its maintenance and upgrade to reflect users' needs. On this particular point, the Strasbourg study gives a good explanation of alternative, so called "second best" approaches.

## 3 Economic Analysis

### 3.1 Economic impact on Ordnance Survey

The economic analysis in this study tests the impact of the change in policy with respect to the provision, as Open Data, of a component of the data products and services provided by Ordnance Survey. The CGE modelling is used to assess the net economic impact in 2016, of the difference between the reference case (the current position), and the counterfactual (no OS OpenData) scenario. There are two direct impacts that need to be considered in developing the impacts (shocks) to compare the economic impact of the two scenarios:

- The economic impact of the income shifts for users and for the Government;
- The productivity impacts for the users of greater use of OpenData.

In this section the study considers the effect of the payments to Ordnance Survey, originally administered by the Department of Communities and Local Government, but now from the Department for Business, Innovation and Skills, and referred to in the text as the OS OpenData contract. These payments are to compensate for the net loss of revenue and other effects attributed to the OS OpenData initiative.

#### 3.1.1 Income Shifts

##### a) Direct Compensation

This is compensation for direct loss of revenue from private and public sectors, but also to cover substitution, and competition effects, plus a fee for running a distribution service and royalties payable to Royal Mail for use of data embedded in OS OpenData products.

For the purpose of calculating the shocks in the CGE model, the impact of removing charges for purchasing OS OpenData is a positive shock for users as it increases their net income and a negative shock for Ordnance Survey and its resellers as they lose this revenue.

##### b) Export Impact

A negative shock, referred to elsewhere in the report as “overseas seepage”, needs to be applied to exports, to account for some revenues previously received being from companies operating in other countries<sup>3</sup> for tax purposes, as determined by their status as zero VAT registered. The cost to the British economy is estimated by Ordnance Survey as an average of £3.72m over the period. This is composed of £0.56m in direct sales and £3.16m in substitution<sup>4</sup>.

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<sup>3</sup> It should be noted that not all revenue will be reported abroad as work is undertaken on the OS OpenData in GB to make it suitable for use within their products. However, in the absence of evidence to the contrary, this approach is the best available.

<sup>4</sup> Information supplied to the consultants by Ordnance Survey.

These fees are income earned from exports, and are negative shocks to the UK government sector, and positive shocks to the rest of the world in the model. Tasman Global CGE is a global model and it would be possible to provide a positive shock to the rest of the world. This might feed back as a positive growth in demand for other products exported from the UK. However this is a subtlety that is beyond the scope of the project and has not been modelled. The loss of exports is therefore only recorded as a negative shock to the UK government sector.

## 3.2 Economic impact on users

### 3.2.1 Introduction

Analysis was undertaken of the economic impact upon the sectors of the economy that are the most significant consumers (or potential consumers) of the products covered by the OS OpenData initiative. The study has focused on the commercial and third sectors. This has been a deliberate decision, to avoid confusing the effects of OS OpenData with those related to the Public Sector Mapping Agreement (PSMA).

In the few cases where research is derived from public sector organisations, it relates specifically to OS OpenData products only.

The following approaches were used:

- **Sector-specific case studies** – examples of organisations making use of OS OpenData to either improve the efficiency of existing processes, improve sales or create new products or services;
- **Cross-sector case studies** – these cover efficiencies and negative effects that are not limited to a single or small group of sectors of the economy but have a wider effect;
- **Download analysis** – an extensive analysis has been undertaken of download records for the period between the OS OpenData launch in April 2010 and January 2012. These have been used to fill gaps in important sectors where no suitable case studies could be found;
- **Other evidence** – during the course of the interview activities, a number of significant qualitative observations were recorded that provide additional insight.

### 3.2.2 Case study summary

The case studies are the result of interviews, mostly conducted by telephone, with nearly 100 individuals. Case studies were written up and sent to the interviewees to check the veracity of the assumptions. It should be noted that it has not proved possible in all cases to get responses to these requests.

As expected, no single “killer app” was identified, but rather a whole series of incremental benefits across a wide range of sectors of the economy. They cover a mix of efficiencies realised by existing users and new innovations. The efficiencies are more prominent than completely new innovations. However, this is to be expected, since the initiative is only two years old and some of the most significant innovations are only now being released. Furthermore, the efficiency gains are found in existing customer organisations where the products are already in use, and so the “friction” associated with implementation is low.

Some significant cross-sector benefits are also identified, particularly significant being route optimisation for medium-size organisations. However, the biggest single area of cross-sector benefit is the reduction in administration and “policing” of OS OpenData products and services that the Open Government licence<sup>5</sup> brings. Negative impacts, from the experience of some value added resellers of Ordnance Survey data, are also included.

NB The case study material is, in many cases, highly commercially sensitive. ConsultingWhere Limited and ACIL Tasman have given assurances to these organisations regarding confidentiality. For this reason the details of the case studies have been omitted, as even without names it may still be possible for readers to identify the organisations by inference.

A brief anonymised description of those case studies included in the economic analysis is given below in Table 1.

<b>Company description</b>	<b>Solution Description</b>
Engineering consultancy	Mapping solution
Renewable energy consultancy	Site selection and design
Utility	Emergency call response Site selection and design
Utility	Background mapping
Data Vendor	Data as a Service Cloud Computing Platform
Data Product Company	New products for data analytics
Software provider	New entry-level product
Survey software	Data to support sales demonstrations
Transport Planning Consultancy	Cloud service
Software/Data Supplier	Improving currency/completeness/accuracy of networks by capture using OpenData
Insurance Company	General Insurance risk profiling
Geoanalytics company	Process efficiencies and improved product offering
Social Media App Developer	Use of OpenData for concept proving
Geospatial data provider	Mapping for iPhone app
Retailer	Use of OpenData products to improve quality of store location analysis over wider range of locations
Charity	Dataset accessibility - analyses relating to membership targeting, advocacy and assessment of major planning schemes facilitated by universal access to OS OpenData
Home delivery service	Improved Problem Analysis
Insulation Installer	Route Optimisation Scheduling, applicable across medium size transport fleets.

<sup>5</sup> <http://www.ordnancesurvey.co.uk/oswebsite/opendata/docs/os-opendata-licence.pdf>

<b>Cross Sector Case Studies (Productivity effects)</b>	
SME Value Added reseller	Processing Inefficiency resulting from multiple organisations undertaking the same task
Simplified Licensing	Saving resulting from reduced administration and license policing

**Table 1: Case Study List**

### 3.2.3 OS OpenData Downloads

As part of the study, the OS OpenData download records were analysed from launch (April 2010) to January (2012); the first 21 months of operation. As far as is known these are a complete set of download records, and include a total of 41,500 individual records.

The analysis was carried out for two purposes:

- To validate the sensitivity of the sector analysis and adoption levels used to “gross up”<sup>6</sup> the impacts from that observed from the case studies;
- To provide an indication of the level of impact already evident in those sectors where no suitable case studies were found.

The methodology and rationale is detailed in Annexe B. This approach has its limitations, given the need to gross up and the lack of detailed data from users, but the Consultants believe it is based on a set of sound principles, and real data in the form of the actual download statistics.

### 3.2.4 Other Evidence

In the course of the study a large body of additional information was gathered. Of particular note, and highlighted by the independent economists’ review, was the importance of data warehouse businesses. The following are relevant notes concerning Google, who are almost certainly the largest provider of geospatial data on a worldwide basis with an estimated 700k websites embedding their mapping data. It is acknowledged in their licensing legal notices<sup>7</sup> that they do make use of OS OpenData in their products. However, it has not been possible to evaluate the economic value of this type of third party use because of a lack of willingness amongst those users of the mapping data approached to discuss such financial matters.

The significance of Google’s user base is not limited to their direct revenue from advertising and enterprise systems supply but also their use as an underpinning geospatial base to the majority of apps now being developed for smartphones. As part of the study, the consultants undertook a sample survey of location apps featured on the data.gov.uk website. The consultants found that around 80% were based on Google maps and a further 10% on OpenStreetMap (OSM).

<sup>6</sup> The turnover of the case study organisation as a proportion of the overall market size has been used as a multiplier to “gross up” the impact.

<sup>7</sup> See para 4.10 of Google maps legal notices [http://www.google.com/intl/en\\_uk/help/legalnotices\\_maps.html](http://www.google.com/intl/en_uk/help/legalnotices_maps.html)

### 3.3 Social impacts of OS OpenData initiative

Broader social and environmental benefits for which there is no market price – so-called 'non-market impacts' – have not been considered up to this point. By their very nature, they are much more difficult to assess because they cannot be easily costed. Examples of such non-market impacts relevant to this study are:

- Valuing citizens' time savings,
- Avoidance of injuries or fatalities; and,
- Environmental gains.

A number of examples of social benefits have been found during the study. As they are difficult to calculate accurately they have not been included in the impacts applied in the CGE model. However, they are real and do add to the economic value realised from the OS OpenData initiative.

### 3.4 Modelling the impacts

#### 3.4.1 Summing up the Impacts

Table 2 below shows how the impacts, described as shocks in CGE modelling, are assembled to provide the overall inputs to the CGE model. Impacts from Tables 4 and 5 (Annexe A) are assigned to economic sectors based on the Office of National Statistics (ONS) Standard Industry Classification Codes (SIC classification). For instance:

- The market shock derived from a wind energy case study is allocated to SIC category D: Electricity, Gas, Steam and Air Conditioning supply sector.

The revenue impacts of OS OpenData as described in Table 2 below which are a positive effect on the commercial sector of the economy are assigned according to the consultants' estimate of the relative size of these sectors in respect to use of geospatial information. These estimates are drawn from the recent assessment of the size and growth prospects of the UK location market undertaken by ConsultingWhere<sup>8</sup>. The negative impact of the OS Open Data initiative on the Government sector is also shown in this column. The total shock columns (Last two columns – RHS) are calculated as follows:

**[ 2016 Low Bound Shock = Case Study benefit (lower bound) + Download Analysis (lower bound) + Private Sector Revenue Impacts ];**

**[ 2016 Upper Bound Shock = Case Study benefit (upper bound) + Download Analysis (upper bound) + Private Sector Revenue Impacts ].**

<sup>5</sup>ConsultingWhere (2012) The UK Location Market Survey 2012: An Assessment of the Current Size and Future Direction of the UK Market for Location Information Products and Services  
<http://www.consultingwhere.com/reports.html>



SIC Sector	Sector Description	Proportion of Commercial Market Size	Commercial + Consumer Product Revenue Impact (£m)	Commercial + Consumer Substitution Revenue Impact (£m)	Commercial + Consumer Competition Impact (£m)	Royal Mail (Royalty) Impact (£m)	Total Impact of Revenue Effects (£m)
A	AGRICULTURE, FORESTRY AND FISHING	2%	£0.03	£0.08	£0.00	£0.03	£0.14
B	MINING AND QUARRYING	1%	£0.03	£0.06	£0.00	£0.02	£0.12
C	MANUFACTURING	0%	£0.00	£0.00	£0.00	£0.00	£0.00
D	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY	14%	£0.29	£0.69	£0.02	£0.23	£1.23
E	WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES	15%	£0.32	£0.76	£0.03	£0.26	£1.36
F	CONSTRUCTION	7%	£0.15	£0.36	£0.01	£0.12	£0.64
G	WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	14%	£0.28	£0.67	£0.02	£0.23	£1.20
H	TRANSPORTATION AND STORAGE	14%	£0.29	£0.68	£0.02	£0.23	£1.22
I	ACCOMMODATION AND FOOD SERVICE ACTIVITIES	0%	£0.00	£0.00	£0.00	£0.00	£0.00
J	INFORMATION AND COMMUNICATION	3%	£0.06	£0.14	£0.00	£0.05	£0.26
K	FINANCIAL AND INSURANCE ACTIVITIES	8%	£0.17	£0.41	£0.01	£0.14	£0.73
L	REAL ESTATE ACTIVITIES	13%	£0.28	£0.66	£0.02	£0.22	£1.18
M	PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	6%	£0.11	£0.27	£0.01	£0.09	£0.49
N	ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES	0%	£0.00	£0.00	£0.00	£0.00	£0.00
O	PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY	0%	£0.00	£0.00	£0.00	£0.00	£0.00
P	EDUCATION	0%	£0.00	£0.00	£0.00	£0.00	£0.00
Q	HUMAN HEALTH AND SOCIAL WORK ACTIVITIES	0%	£0.00	£0.00	£0.00	£0.00	£0.00
R	ARTS, ENTERTAINMENT AND RECREATION	2%	£0.04	£0.10	£0.00	£0.03	£0.18
S	OTHER SERVICE ACTIVITIES	1%	£0.01	£0.03	£0.00	£0.01	£0.05
T	ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE	0%	£0.00	£0.00	£0.00	£0.00	£0.00
U	ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES	0%	£0.00	£0.00	£0.00	£0.00	£0.00
	Total	100%	£2.06	£4.91	£0.16	£1.67	£8.80
						Check:	£8.80

Table 2 Summary of Shocks by Industry Sector

## 3.5 Results of economic modelling

### 3.5.1 Model Outputs

Impact is assessed as the change in GDP as a result of implementing the policy. Table 3 below summarises the projected impacts for lower and upper bound scenarios on the economy of Great Britain. It also presents a detailed breakdown of the estimated changes in real GDP and real income. To simplify interpretation, all results have been presented as changes due to the effect of the OS OpenData Policy Initiative – that is the difference in economic indicators between the reference case and the counterfactual case.

Ref		Sensitivity - Lower bound	Sensitivity - Upper bound	Derivation
		2016	2016	
		2011 £m	2011 £m	
		Lower bound	Upper bound	
1	Change in real consumption	8.14	20.25	
2	Change in real investment	2.32	5.05	
3	Change in real exports	6.06	10.28	
4	Contribution of change in real imports	-3.56	-7.09	
5	<b>Change in real net foreign trade</b>	<b>2.50</b>	<b>3.19</b>	3+4
6	<b>Total change in real GDP (expenditure side)</b>	<b>12.95</b>	<b>28.49</b>	1+2+5
7	Change in value added	0.42	2.07	
8	Change in tariff revenue	-0.08	0.06	
9	Other tax revenue changes	4.51	8.20	
10	Productivity effects	8.10	18.16	
11	<b>Total change in real GDP (income side)</b>	<b>12.95</b>	<b>28.49</b>	7+8+9+10
12	Change in terms of trade	-2.76	-4.30	
13	Change in net foreign income transfers	-0.02	-0.08	
14	<b>Total change in real GNP</b>	<b>10.17</b>	<b>24.10</b>	11+12+13

Data source: Tasman Global modelling estimates

\* Note that an increase in real imports has a negative contribution to the change in real GDP.

**Table 3 Macroeconomic Impacts of OS OpenData Policy Initiative**

Notes:

- Changes in tax revenues are changes in the tax revenue at the existing specific tax rates. They are sometimes called changes in the 'real tax revenue' and, with some small caveats, they are first order estimates of the changes in the allocative efficiency of the economic system.
- As discussed in Pant (2007)<sup>9</sup>, the decomposition of the change in real GDP from the income side are approximations only as there are allocative effects induced by changes in domestic relative prices that have not been isolated correctly. Nevertheless, the decomposition is still useful to shed light on the first order contribution of the different sources of change.

#### a) Real GDP

Drawing from the discussion presented earlier in the report, the OS OpenData Initiative is projected to result in a range of productivity improvements throughout the economy of Great Britain (albeit also resulting in reduced direct exports by Ordnance Survey and some transfer payments).

<sup>9</sup> Pant, H.M. 2007, *GTEM: Global Trade and Environment Model*, ABARE Technical Report, Canberra, June.

Based on the study's conservative estimate of the productivity improvements, the *Tasman Global* model result predicts that, by 2016, Great Britain's real GDP will have increased by between a lower bound of £13.0 million, and an upper bound of £28.5m. This is as a direct result of the OS OpenData Initiative.

While this is a small proportion of GDP, it is however an indication of the positive net economic impact of a relatively small policy change.

The net increase in real taxation revenue lies between a lower bound of £4.4 million and an upper bound of £8.3 million.

#### **b) Real income and terms of trade**

Although the decline in terms of trade offsets the growth in real GDP, total welfare of Great Britain residents is still projected to be greater as a result of the OS OpenData Initiative.

In particular, real income (real GNP) in 2016 is estimated to increase by between a lower bound of £10.1 million and an upper bound of £24.1 million as a direct result of the OpenData Initiative.

#### **c) Other macroeconomic variables**

Real consumption (by £8.1 million – £20.3 million) and real investment (by £2.3 million – £5.1 million) are also projected to increase as a result of the OS OpenData Initiative.

Also associated with the OS OpenData Initiative is a net increase in total real exports of between £6.1 million and £10.3 million despite the direct loss of an estimated £3.7 million from reduced revenue from companies based overseas.

The increased exports will enable British residents to purchase more foreign goods and services with real imports projected to increase by between £3.6 million and £7.1 million.

The modelling assumption, that labour supply and unemployment remain constant between the scenarios, means that the modelling results show no employment change. If this constraint were relaxed, employment would grow, provided there was spare capacity in the labour market. This would be offset by lower increases in wages and salaries than shown in this model result.

### **3.5.2 Summary**

Overall these effects are likely to increase the projected increase in real GDP and real income, with the size of the increase, compared to the projections presented in this analysis, dependent on the amount of spare capacity in the labour market.

## 4 Conclusions and Recommendations

### 4.1 Conclusions

#### 4.1.1 Economic Assessment

The study estimates that the OS OpenData initiative will deliver a net £13.0 million - £28.5 million increase in GDP in 2016. The main components of this increase are net productivity gains (£8.1 million – £18.2 million) and additional real tax revenues (£4.4 million – £8.3 million).

The increase is also net of £3.7 million per annum, applied as a negative shock to GB exports, to account for OS OpenData being integrated in to products of companies paying taxes abroad. Despite the fact that GB loses this export income, overall the value of exports to the economy increases by £6.1 million – £10.3 million as other sectors of the economy expand.

Another important metric is the increase in real national disposable income (real GNP) in the range £10.2 million – £24.1 million by 2016. This is an indication of the increase in economic welfare for British society as a whole.

The change in policy to provide OS OpenData free at the point of delivery is argued by the study to be a specific form of implementation of a wider policy of marginal cost pricing. This is argued to be a “first best” option that avoids the need for segmented or structured pricing frameworks.

The results of the CGE modelling demonstrate an improved level of productivity in the economy, and higher overall levels of output, directly attributable to making OS OpenData free at the point of delivery.

However, it important to recognise that the analysis assumes that Government will continue to fund the organisation to ensure that it can meet its responsibilities to maintain and this data to ensure it continues to have value for the users.

#### 4.1.2 General equilibrium verses partial equilibrium analysis

The consultants conclude that recent literature has acknowledged that both partial and general equilibrium modelling have a place in assessing economic impacts of public sector data. However, partial equilibrium modelling is more suited to assessing the impacts of a specific product or service where policy change is not likely to result in resource shifts in elsewhere in the economy. Where the policy change applies to a number of services as is the case with OS OpenData, and where there are material implications for value added in many other sectors of the economy, general equilibrium modelling is a more robust approach.

#### 4.1.3 Pricing policy

The change in policy to provide OS OpenData free at the point of delivery implemented a policy of marginal cost pricing. This is a first best option that avoids the need for segmented or structured pricing frameworks.

The results of the CGE modelling demonstrate an improved level of productivity in the economy, and higher overall levels of output, directly attributable to making OS OpenData free at the point of delivery.

However, it is important to recognise that the analysis assumes that Government will continue to fund the organisation to ensure that it can meet its responsibilities as custodian of this data.

The theory of the "second best" implies that if Government does not continue to fund the organisation at a level to meet these responsibilities a less optimal outcome is likely for economic welfare as a whole as well as for the ability of Ordnance Survey to continue to provide the services necessary to realise the economic benefits potentially available.

## 4.2 Recommendations

### 4.2.1 Standardisation of Economic Evaluation

Much of the discussion in the report has centred on establishing the validity of different economic approaches, and acceptance of the metrics which underpin the assessment of value. It is evident that the transport industry, led by the DfT, has invested much effort in standardisation of approaches and creation of tools to facilitate economic appraisal of proposed policy interventions. Their experience could usefully be applied within the geospatial industry.

**The consultants recommend that OS, in conjunction with the geospatial industry, sponsor an initiative to establish common methodologies for evaluating economic value from proposed policy initiatives ideally before rather than after the political decisions have been made.**

### 4.2.2 UK-wide Approach

Many of the interviewed organisations are operating across the whole of the United Kingdom. The lack of an equivalent initiative in Northern Ireland means that the benefits of OS OpenData are less than would otherwise be the case. In some sectors this has caused them not to use OS OpenData in many of their products. One interviewee estimated that 85% of their customers operated UK-wide and they had decided not to change their embedded licensing terms for OS data to avoid confusion.

**It is recommended that the results of this study are shared with the Northern Ireland government in order to attempt to persuade them to adopt a similar policy.**

### 4.2.3 Product Maintenance

Many organisations are concerned that OpenData will not be maintained to the same degree of currency as paid-for products and hence its value will decline over time. They need to be reassured that this is not the case. This would be facilitated by OS clearly publishing and publicising details of the maintenance regime for OpenData.

**The consultants recommend that OS publicise commitments to maintenance and currency of the OS OpenData products.**

### 4.2.4 Awareness

There is a lack of awareness in certain sectors of the benefits of OS OpenData. The B2C application developer community is currently over-represented by "social applications" designed to support political or social campaigns. It is the belief of the Consultants that the smaller app development companies are not sufficiently aware of the potential of

OS OpenData. Other sectors identified as lacking the awareness of the free authoritative content now available include the agricultural sector.

**The consultants recommend renewed publicity for the OS OpenData initiative, focusing particularly on parts of the private sector where this study has identified significant gaps in awareness.**

#### **4.2.5 Database Supply**

A number of interviewees expressed frustration with the need to download and stitch together multiple tiles. This has been a discouragement to use of OS OpenData and in one case had meant that the potential user had abandoned investigation of the products.

**The consultants recommend that OS OpenSpace is enhanced to enable a complete download option for the tiled datasets.**

# Annexe A: Detailed modelling of financial impact of OS OpenData

## A.1 Impact of Case Studies

The impact of the productivity improvements from the case studies outlined in section are calculated according to a common set of metrics as shown in Table 4 overleaf.

The table is structured as follows:

- **Standard Industry Classification (SIC)** - each case study is assigned to a sector, or where multiple sectors will be impacted, each is identified. The sector classification used is the Standard Industry Classification<sup>10</sup> used by the Office of National Statistics.
- **Sub-sector** - the SIC sub-sector reference is also identified where possible; the significance of the sub-sector is that few case studies cover all sector activities where OS OpenData could potentially be used.
- **Annualised net benefits** - estimated from interviews, annualised on the basis of the predicted growth from implementation to March 2016.
- **Sector size multiple** – derived from calculating the organisation’s turnover from activities that relate directly to their use of OS OpenData identified in the case study as a proportion of our estimate of the overall size of the sector to which the OpenData use could be applied.
- **Sensitivity** – a percentage range representing the confidence in the net benefits and size of sector multiplier. For the lower bound calculation, half the sensitivity is applied as a reducing factor to the net market benefit and for upper bound it is applied as an increasing factor.
- **Adoption Level** – is a percentage of implementation that might be achieved for the application cited in the case study over the period through to 2016. Lower and upper bound estimates are provided.
- **Net Market Benefits** in 2016 (p.a.) – calculated from the formulae:  
[ Net market benefit (lower bound) = Annualised net benefit x Sector size multiplier x (1 – 50% Sensitivity) x Lower Bound Adoption Level ];  
  
[ Net market benefit (upper bound) = Annualised net benefit x Sector size multiplier x (1 + 50% Sensitivity) x Upper Bound Adoption Level ].

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<sup>10</sup> See <http://www.statistics.gov.uk/statbase/product.asp?vlnk=14012>

# OS OpenData Economic Value Study

Case Study Name	Description	SIC	SIC sub-sector	Annualised Net Benefits	Sector Size Multiplier	Multiplier Estimate Sensitivity	Adoption Lower Bound (by 2016)	Adoption Upper Bound (by 2016)	Net Market Benefit 2016 (lower bound) (£m)	Net Market Benefit 2016 (upper bound) (£m)	
Engineering Consultancy	Mapping Solution	M	74.90/1	75000	24	10%	75%	100%	£1.28	£1.89	
Renewable Energy Consultant	Site selection and design	D	35.11	15887.5	64	10%	75%	100%	£0.73	£1.07	
Utility	Emergency Call response	D		5577	7	20%	80%	100%	£0.03	£0.04	
	Site selection and design	D		35640	1	0%	100%	100%	£0.04	£0.04	
Utility	Rationalising Background mapping	E		27500	14	10%	50%	100%	£0.18	£0.39	
Data Vendor	Data as a Service Cloud Computing Platform	J	62	55750	43	20%	75%	100%	£1.61	£2.62	
Data Product Company	New products for data analytics	J	62	300000	5	40%	50%	75%	£0.60	£1.35	
Software Provider	New entry-level package	J	62	115000	12	20%	40%	80%	£0.50	£1.21	
Survey software	Data to support sales demonstrations	J	62	5000	277	10%	75%	100%	£0.99	£1.46	
Transport Planning Consultancy	Cloud service	H	52.2	200000	8	40%	20%	50%	£0.26	£0.96	
Software and Data Provider	Improving the currency / completeness / accuracy of road network by capture using OpenData	J	63.9	46860	10	10%	75%	100%	£0.33	£0.49	
Insurance Company	General Insurance Risk Profiling	K	65.1	140000	17	40%	25%	50%	£0.47	£1.42	
GeoAnalytics company	Process efficiencies and improved product offering	M	72.3	255000	3	10%	80%	100%	£0.49	£0.68	
Social media App developer	Use of OpenData for concept proving	J	62.01	15000	150	40%	10%	20%	£0.18	£0.54	
Geospatial data provider	Mappinf for iphone app	L	68.3	6.025	40000	20%	20%	60%	£0.04	£0.16	
Retailer	Use of OpenData products to improve quality of store location analysis over wider range of locations	G	47	110000	3	10%	50%	100%	£0.17	£0.38	
Charity	Dataset accessibility - analyses relating to membership targeting, advocacy and assessment of major planning schemes all facilitated by universal access	S	94.99	44800	8	20%	25%	75%	£0.08	£0.31	
Home Delivery Service	Improved Problem Analysis	G		28920	8	20%	50%	75%	£0.10	£0.18	
Insulation Installer	Route optimisation and scheduling	A	49.41	20000	1186	40%	10%	20%			
		F	0.05						£0.09	£0.28	
		G	0.2						£0.38	£1.14	
		H	0.1						£0.19	£0.57	
			0.65						£1.23	£3.70	
									Sub-total	£9.98	£20.89
									Check	£9.98	£20.89
Cross Sector Case Studies (Productivity effects)											
SME Value Added reseller	Processing Inefficiency	Prod	All	-50000		10%	25%	75%	-£0.12	-£0.39	
Simplified Licensing	Averaging of sample cases	Prod	All	4000		10%	80%	100%	£1.36	£1.87	
									Sub-total	£1.24	£1.48
									Case Study Total	£11.22	£22.38

Source: ConsultingWhere

**Table 4 Direct productivity impacts by case study**



## A.2 Impacts from Download Analysis

The impact of the productivity improvements from the download analysis outlined in section 3.2.3 are calculated according to a common set of metrics as shown in Table 5 below.

The table is structured as follows:

- **Sub-sector Name** – based on categorisation within download records;
- **Description** – describing of the scope of the sub-sector;
- **Standard Industry Classification (SIC)** - each case study is assigned to a sector, or where multiple sectors will be impacted, each is identified. The sector classification used is the Standard Industry Classification used by the Office of National Statistics;
- **Sub-sector** - the SIC sub-sector reference is also identified where possible; the significance of the sub-sector is that most cover only a proportion of the sector activities where OS OpenData could potentially be used;
- **Annualised Downloads** – the download records cover a period of 21 months, so the figures are simply divided by the ratio 12/21 to provide an annual estimate;
- **Single Use** – number of instances where only a single download has been made in the period, this is assumed to imply evaluation only;
- **Routine use** – number of instances where repeated downloads of the same product have been made. This is assumed to imply embedding in organisational workflows;
- **Sector Average Hourly Rate** – this is an indicative average labour rate for professional staff in the sector;
- **Evaluation Time** – conservative estimate of one-off time taken to prepare, download and perform basic evaluation of OS OpenData products. In all cases this has been assumed as two (2) hours;
- **Implementation Time** – multiple use is assumed to imply embedding in organisational workflows. From our experience, we have made a very cautious estimate of the minimum time this might take based on the likely complexity of the applications identified from the download records and other intelligence gained during the study;
- **Current Value** – is calculated as:  

$$[ ((\text{Single Use} \times \text{Evaluation Time}) + (\text{Routine Use} \times \text{Embedding Time})) \times \text{Hourly Rate} ]$$
- **Estimated Current Adoption** – is based on assessing the proportion of the sector (by turnover) represented by those companies, who are assumed to have embedded products in workflows.
- **Adoption Lower Bound (2016)** – represents the level, based on the current adoption that can reasonably be expected as a minimum level of adoption by 2016.
- **Adoption Upper Bound (2016)** – represents the level, based on the current adoption that can reasonably be expected as a maximum level of adoption by 2016.
- **Net Market Benefit\*** (by 2016) – is then calculated as  

$$[ \text{Current value} \times \text{Adoption} ]$$

[Where “ \* ” = Upper and lower bound figures are calculated]

Sub-sector Name	Description	SIC	SIC sub-sector	Annualised Downloads	Single Use	Repeated Use	Sector Average Hourly Rate	Evaluation Time (hours)	Implementation Time (hours)	Current Value (£k)	Estimated Current Adoption	Adoption Lower Bound (by 2016)	Adoption Upper Bound (by 2016)	Net Market Benefit 2016 (lower bound) (£k)	Net Market Benefit 2016 (upper bound) (£k)	Comments
Leisure	Undifferentiated use for leisure purposes	R		3473	3450	23	£5	2	10	£36	5%	10%	20%	£71.3	£142.6	Diverse range of uses from hobbyists to community groups
Banking	banks and building societies	K	64.1	107	97	10	£50	2	37.5	£28	50%	75%	100%	£42.7	£56.9	Customer profiling and fraud detection
Land and Property	estate agents and house builders	L	68.1	386	350	36	£30	2	37.5	£62	20%	60%	80%	£184.5	£246.0	
Telecom	Mobile operators and service suppliers	J	61	40	28	12	£40	5	50	£30	40%	60%	80%	£44.4	£59.2	A significant application is for radio wave propagation maps
Media	news, advertisers and service companies	J	58.1	49	42	7	£30	2	37.5	£10	10%	25%	50%	£26.0	£52.0	Producing maps for newspaper features through to location analysis for advertisers
Architecture and Design	Built environment	M	71	53	41	12	£30	2	37.5	£16	20%	60%	80%	£47.9	£63.8	Predominant users are consultancies and house builders
Total														£416.7	£620.5	
													Check:	£416.7	£620.5	

**Table 5 The impact of productivity improvements estimated from the download analysis**

## B Annexe B: Methodology and rationale for analysis of data downloads

As part of the study the Consultants analysed download records from launch (April 2010) to January (2012), the first 21 months of operation. As far as is known, this represents a complete set of download information, and includes a total of 41,500 individual records. Downloads may be of complete datasets, or where the dataset is geographically divided, such as OS VectorMap District, may consist of one or many tiles. The information supplied covers:

- **Date of download** – the statistics cover requests for supply by DVD as well direct downloads but do not cover OS OpenSpace access where data is consumed through a web service.
- **Breakdown by sector** (according to OS categorisation<sup>11</sup>) – with a text option where the “other” category was selected;
- **Email address of the requesting organisation** – Requests from what appear to be personal addresses (e.g.: gmail, hotmail, btinternet and other identifiable ISP domains) have been removed from the analysis, except when evaluating leisure and community use.

The analysis has been used for two purposes:

- To validate the sensitivity of the sector analysis and adoption levels used to “gross up”<sup>12</sup> the impacts from that observed from the case studies;
- To provide an indication of the level of impact already evident in those sectors where no suitable case studies were found.

These two uses are now elaborated.

### B.1 Sector Impacts from Case Studies

The independent economics review identified that the assumptions used in “grossing up” the sub-sector impacts, based on the case studies were critical to establishing the credibility of the study.

#### B.1.1 Sensitivity

For each case study, the study analysed the statistics to evaluate whether other businesses known to be active in the same sub-sector of the market, for instance environmental impact assessment, have also downloaded the same products. A high download count of the major businesses (by turnover), particularly where the business has made repeated accesses, has been taken as an indication that “grossing up” is likely to be valid and that the case study is not unique.

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<sup>11</sup> OS market sector categorisation is similar to the ONS Standard Industry Classification

<sup>12</sup> The turnover of the case study organisation as a proportion of the overall market size has been used as a multiplier to “gross up” the impact.

A figure of 20% sensitivity; i.e.: pessimistic forecast (lower bound) of -10%, and an optimistic forecast (upper bound) of +10%, was applied, where the download count was high. A wider sensitivity of 40% was applied where the records showed less widespread download by major businesses. In some cases sensitivity was not applied because they are not relevant, as where case studies apply to a unique function, such as electricity generation.

### B.1.2 Adoption

The principle established for sensitivity can also be applied to adoption. The proportion of most active users making repeat downloads has been used to estimate the current adoption rate. The lower bound adoption rate by 2016 is taken as the current rate and the upper rate then based on extrapolating forward that rate based on the standard Rogers approach for web technology adoption.

## B.2 Sectors with no Case Studies

The number of potential uses of OS OpenData is obviously very great. The study was cognisant of the depth and width of use from a recent assessment of the size of the UK location market, referenced elsewhere. In some sectors the study was unable to elicit responses from some who were known to be making significant use of OS OpenData products but who were unable or unwilling to make time available to assist. In other cases, such as the leisure sector, the range of uses is so diverse that the logic for “grossing up” is flawed.

The study identified four sectors that were recognised as significant potential consumers of OS OpenData without case studies:

- Banking
- Media (including advertising agencies)
- Architecture and design
- Leisure and Community

The underlying principle in estimating impacts has been to adopt a cautious approach, particularly where evidence is indirect. The download analysis shows two main types of usage pattern:

- Single downloads** – one or many products have been downloaded but only once. This is assumed to indicate some type of evaluation process. In this case, the decision to download and evaluate represents an opportunity cost – the resources used to undertake the evaluation could have been deployed on some other activity. The lowest value that can be assigned based on this assumption is the value of the time taken to perform the evaluation. From prior experience in performing such work, the study assigned an estimate of 2 hours to this task.
- Repeat usage** – this is taken as circumstantial evidence of embedding of the data into business processes. Again, using an opportunity cost approach, a minimum period for the simplest of such implementations was estimated, at 5 working days (37.5 hours).

The impact is then calculated by summing the unique annualised company downloads in the sector for single and repeated use scenarios, and multiplying by the overheaded rate per hour for labour, based upon Treasury Green Book advice on the value of time in business case development.

### **B.3 Limitations of this Approach**

This approach is obviously not an exact science but is, the Consultants believe, based on a set of sound principles and real data in the form of the actual download statistics.

The alternative approach would have been to undertake a market survey, which was beyond the scope of the project. Furthermore, it is believed to be doubtful that a statistically significant sample would have been obtained from such an exercise –strong advice was received from within Ordnance Survey that “survey fatigue” would mitigate such an approach.

Whether the level of savings from an individual case study is representative of a sector as a whole is dependent on many factors, not least how efficient each organisation implements the necessary changes to processes. Within the scope of the study it is not possible to evaluate this variable, although it is clearly recognised as a factor.

# Annexe C: Summary of the review undertaken by analysts from the Department for Business, Innovation and Skills



## Assessing the Value of Ordnance Survey OpenData to the Economy and Great Britain

BIS analysts have reviewed the methodology of this report and discussed it with the authors. This is a challenging area to quantify, and they have used all the evidence available to do so. Below is a summary of our understanding of what they have done, together with some comments on the methodology.

The suite of products released in April 2010 as OS OpenData represented the largest data release of its kind, allowing consumers to use and re-use a wide range of geographical information. This report is a good step towards understanding the impact of Ordnance Survey OpenData, and is a useful contribution to the evidence on the benefits of open data on the economy. Due to factors such as the timing, which comes relatively soon after the data release, and the small sample size of the study, there is a limit to how definitive the conclusions can be, and a follow up study at an appropriate time in the future would be useful.

The study used a bottom up approach for assessing the economic impact of Ordnance survey open data. The study combined case study data with download data, and the outputs of this were then fed into a computerised general equilibrium (CGE) model. This CGE model then generated projections of the GDP growth associated with the provision of Ordnance Survey Open Data.

The case study data was gathered through interviews with private and third sector organisations using the data. These interviews also provided qualitative insights about how the data is being used by organisations in different sectors of the economy. This element of the study provides a contribution to understanding how firms in different sectors are using the data, and on its first order impacts of Ordnance Survey OpenData. In the study, grossing up of the quantitative data captured through these interviews was done by triangulation with download data and by applying sensitivities to the resulting figures to produce a range. These ranges were then inputted into a general equilibrium model (CGE).

CGE models are recognised way of estimating economic value eg the Bank of England uses them. These models simulate the economy through a series of computations which essentially magnify their inputs. The consequence of this is that if the model inputs are inaccurate, these inaccuracies will be magnified in the output of the model. This should be considered when interpreting the model results.

Some caution is required in using these findings. Although around 70 firms were contacted to participate in the interviews, only a small proportion of these (around 20) did so. The majority of those contacted were unable to articulate the benefits of using the data and therefore were not included in the study. Those that were able to articulate this were typically already aware of, and in some cases using, the data before its use became unrestricted. In essence this methodology assumes that the 20 are representative of those who are downloading data, but in practice as they are those who can articulate the benefits they may well be getting greater benefits than the average user. More generally firms which were able to respond to the interview questions may have different characteristics to other firms.

The study grosses up the results using sector multipliers and OS OpenData download records, applying a sensitivity to the resulting analysis to calculate an upper and lower bound estimate. However, there appears to be no evidence underpinning the choice of sensitivities applied to the analysis.

The case studies included one organisation (a value-added reseller of OS data) which had been negatively effected by the release of Open Data. It does therefore capture the potential for substitution effects as customers move away from other data sources to OS Open Data. However, it is not clear how these effects were grossed up to be fed into the model.

The study is static and therefore does not estimate dynamic impacts. For example, it does not tell us if users have gained a competitive advantage from using the data and may therefore squeeze market share from non-user firms over time.

In the study, the interview results were fed into a CGE model to estimate the impacts on the wider economy. This is not an exact science since these models are driven by a series of assumptions and data extrapolations. Such results should be interpreted more qualitatively than quantitatively. i.e. they tell us that Ordnance Survey opendata has generated an economic benefit.



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