Meadowhall Centre's contribution to the Sheffield City Region and the Rest of the UK

December 2015

Methodology note

pwc

Contents

Glossary of terms and acronyms

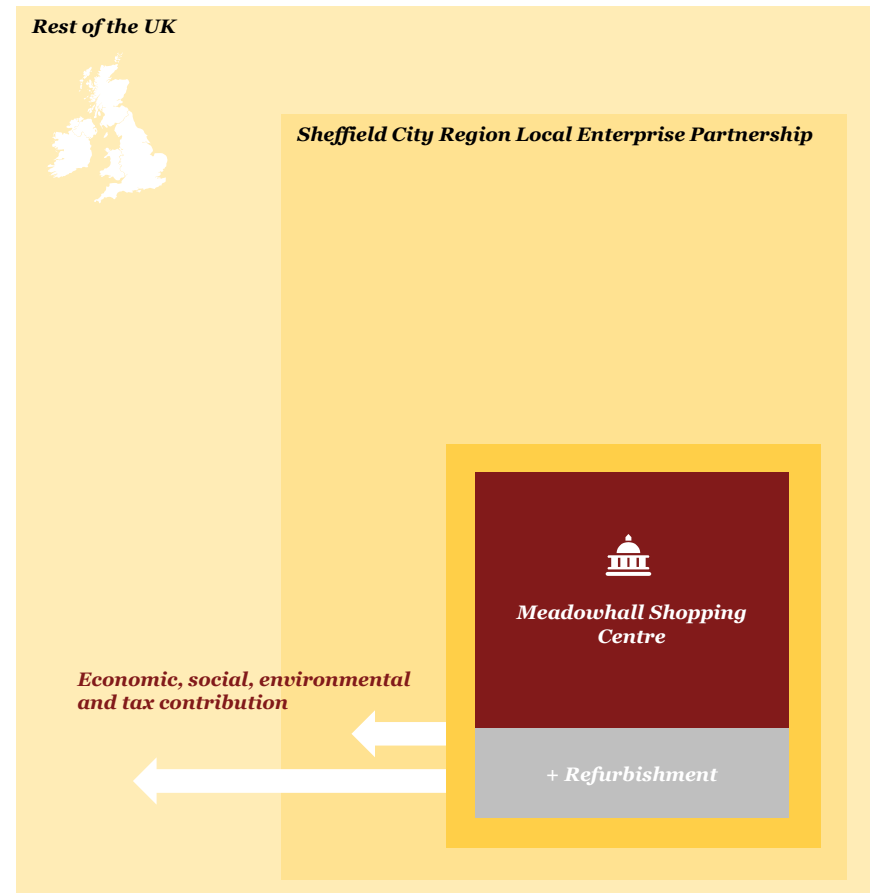|	
Carbon emissions	Greenhouse gas emissions. Measured in CO2-e.
CPA	Common Parts Area. The area of the shopping centre directly controlled by the landlord.
CO2-e	Carbon Dioxide equivalent. Measure to compare the emissions from various greenhouse gases based upon their global warming potential.
FTE	Full-time equivalent. The full-time employment of a person for one year.
FY	Financial year (from March to April). For example, FY15 refers to Financial year 2014-2015.
GDP	Gross Domestic Product. Monetary measure of the value of goods and services produced in an economy.
GVA	Gross Value Added. Monetary measure of the value of goods and services produced in an area or sector of the economy.
H&S	Health and Safety.
HMRC	Her Majesty's Revenue and Customs.
HSE	Health & Safety Executive.
Meadowhall	Meadowhall Shopping Centre. Consists of activities by the landlord, managing agent and occupiers but analysed as a single entity.
NIC	National Insurance Contribution. Social security contribution in the UK.
NOx	Nitrogen Oxides. Types of air pollutant.
PAYE	Pay-as-you-earn. Personal income tax in the UK.
PM10	Particulate Matter ~10 microns in size. Type of air pollutant.
PM2.5	Particulate Matter ~2.5 microns in size. Type of air pollutant.
Rest of the UK	All areas of the UK except for the Sheffield City Region.
Sheffield City Region	The geographic area covered by the Sheffield City Region Local Enterprise Partnership.
TTC	Total Tax Contribution. PwC methodology to estimate the total cash contribution made by an organisation.

Purpose and scope of this study (1/2)

The British Land Company plc ("British Land") commissioned PwC to produce an impact assessment of Meadowhall Shopping Centre ("Meadowhall") to assist in their ongoing monitoring and evaluation commitments for the Meadowhall asset, as well as in support of Meadowhall's 25th anniversary celebrations.

Our assessment of Meadowhall's contribution considered economic, tax, social and environmental impacts at regional and UK level. Meadowhall's regional impact is defined as the contribution to the area covered by the Sheffield City Region Local Enterprise Partnership ("Sheffield City Region").

The assessment looks at Meadowhall's direct, indirect, induced and enabled contribution. These are defined as follows:

- **Direct**: The contribution of Meadowhall's own operations, e.g. individuals directly employed at Meadowhall, including occupiers.

- **Indirect**: The contribution of Meadowhall's UK supply chain, e.g. the individuals employed by Meadowhall's suppliers (but only to the extent that these can be attributed back to Meadowhall's purchasing activities).

- **Induced**: The contribution through household consumption enabled by the wages Meadowhall and its suppliers pay to their employees, e.g. individuals employed at the supermarkets households buy from.

- **Enabled**: The wider contribution enabled by Meadowhall, e.g. the training delivered by The Source Skills Academy.

Figure 1: Study scope

Rest of the UK

Sheffield City Region Local Enterprise Partnership

Meadowhall Shopping Centre

+ Refurbishment

Economic, social, environmental and tax contribution

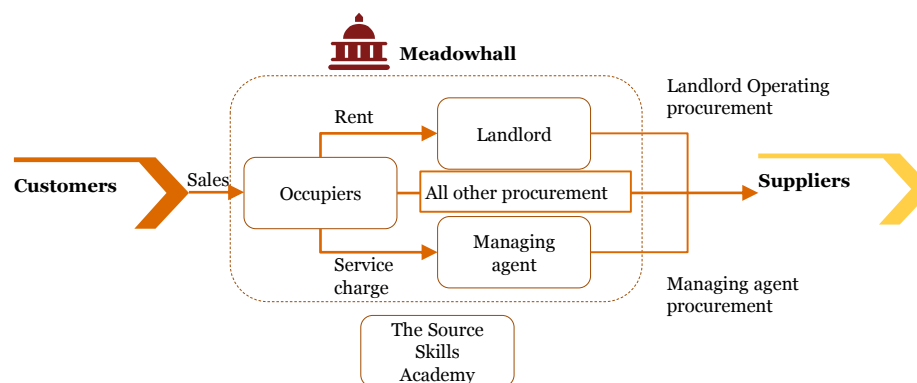Source: PwC

Purpose and scope of this study (2/2)

Our study analyses gross impacts looking at the Meadowhall as a single entity, rather than solely focusing on the areas controlled by the landlord. As depicted in Figure 2, Meadowhall is defined as the joint activities of the landlord, managing agent and occupiers. It also shows how Meadowhall interacts with the wider value chain through sales to customers and procurement from suppliers.

The Source Skills Academy sits outside of our definition of Meadowhall, because it acts as an independent entity. However, it's been included in the overall assessment as its existence has been enabled because of Meadowhall.

Table 1 below outlines the specific indicators covered by our assessment and indicates both the methodology used and the robustness of the results based on the level of data availability and estimation required.

All data are reported for financial years, which run from March to April, unless otherwise indicated.

Figure 2: Meadowhall definition and its interaction with the value chain

Source: PwC

Table 1: List of indicators assessed

Indicator covered	Measured as	Methodology	Level of robustness based on data availability
Economic	Gross Value Added, employment	Direct reporting for landlord and managing agent Direct reporting for occupiers Input-output modelling for Meadowhall (all entities)	H L M
Fiscal	Total tax contribution	Direct reporting for landlord and managing agent Estimates for occupiers Input-output modelling for Meadowhall (all entities)	H M L
Social	Training and skills development, Health & Safety, Community programme	Direct reporting for managing agent and The Source Skills Academy Estimates of occupiers Input-output modelling for Meadowhall (all entities)	H M L
Environmental	Carbon emissions, air quality, water use, waste generation	Direct reporting for Common Parts Area Estimates for occupiers Input-output modelling for Meadowhall (all entities)	H L L

Economic contribution approach (1/4)

We estimated Meadowhall's economic contribution to the Sheffield City Region and Rest of the UK using two main indicators:

- Gross Value Added (GVA)

- Employment supported: measured as number of jobs (headcount) and their full-time equivalent (FTE)

GVA is a measure of the value generated in the economy and represents the difference between the value of goods and services sold and the goods and services used as an input to their production. Hence, it is the organisation-level equivalent of Gross Domestic Product (GDP): adding up the GVA of all individual organisations in the economy is equivalent to a country's GDP.[1] GVA is distributed as profits (earnings before interest, taxes, depreciation and amortisation, or EBITDA) and wages.

We assessed Meadowhall's contribution to GVA and employment at three levels:

1. **Direct contribution:** The increase in GVA as a result of the economic activity taking place within Meadowhall.

2. **Indirect contribution:** The increase in GDP and employment from Meadowhall's demand for goods and services from its suppliers and their suppliers.

3. **Induced contribution:** The increase in GDP and employment in the wider economy as a result of wages being spent by the employees of Meadowhall and its suppliers.

[1]After adjusting for taxes and subsidies on products, a component of GDP which is not included in the calculation of GVA.

Economic contribution approach (2/4)

Approach to estimating direct economic contribution

We estimated Meadowhall's direct contribution to GDP using an income approach from data contained in the financial accounts of the entities that together make up Meadowhall (landlord, managing agent, and occupiers). The following equation is used:

Direct contribution to GDP
= profit before interest and taxation + employee costs
+ depreciation + amortisation

These indicators are prepared for the UK only and do not account for any overseas impact.

Direct employment is taken directly from the managing agent's human resources data and from estimates prepared for occupiers. For the managing agent, the breakdown by region is based on the home address of its employees. For occupiers, the regional breakdown was estimated using postcode survey data from a subset of 500 occupier employees conducted in 2015.

Approach to estimating indirect and induced economic contribution

Indirect and induced economic contribution are estimated using an Input-Output model.

An Input-Output model enables us to understand how industries in an economy relate to each other. On this basis we can estimate how activity by one company stimulates economic activity elsewhere in the economy.

The indirect (or supply chain) contribution is estimated using Meadowhall's procurement data. We analysed the purchase ledgers for both the landlord and the managing agent, while estimating that of occupiers using sector data.

The Input-Output model provides information on what the typical business in the supplier's sector requires for producing one unit of output. Equally, we can model the supplier's input requirements from other sectors to produce its own unit of output. In this way we can trace back the input requirements through the entire supply chain, and calculate the total value of production stimulated. This process of one company stimulating economic activity in other companies is referred to as the multiplier effect.

In addition to the above, an Input-Output table provides data on the share of revenue that constitutes profit and wages for each sector. We can apply this ratio to the total production value stimulated, and hence estimate the total GVA in the supply chain by sector associated to this.

Additional statistics on employment provide information on the number of people that work in any particular sector. As we know the output stimulated in each sector, we can estimate the production value to job ratio. We can then apply this to the total production value stimulated in the supply chain. This allows us to estimate the number of jobs supported in the supply chain – the indirect employment.

These steps get repeated for calculating the induced contribution, but through using wage data to estimate how much production is stimulated in the supply chain that supports the products employees buy e.g. accommodation, food and entertainment.

Economic contribution approach (3/4)

Model data sources

We developed a multiregional Input-Output model which distinguishes between the Sheffield City Region and the Rest of the UK. The model was developed on the basis of the UK Input-Output tables prepared by the UK Office for National Statistics (ONS).

We combined data from the Input-Output tables with employment data for the relevant years to obtain employment to output ratios. These have been updated using estimates for labour productivity and inflation to reflect the years of our assessment.

Figure 4: A simplified version of an Input-Output table, the basis for an Input-Output model
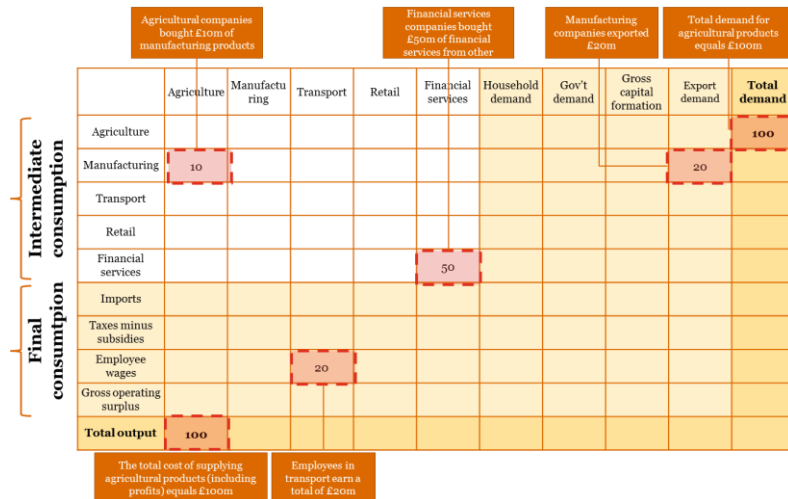
Source: PwC

**Table 2: Key data sources for our Input-Output model**

Country	Source
Input-Output tables	
UK	ONS, UK Input-Output Analytical tables, 2010
Sheffield City Region	ONS, UK I-O Analytical tables, 2010, PwC Analysis
Employment data	
All geographies	Nomis, ONS. Annual Employment Statistics (BRES) for relevant years

Economic contribution approach (4/4)

Figure 5: A simplified representation of the relation between Meadowhall and its supply chain *(note: hypothetical numbers used)*
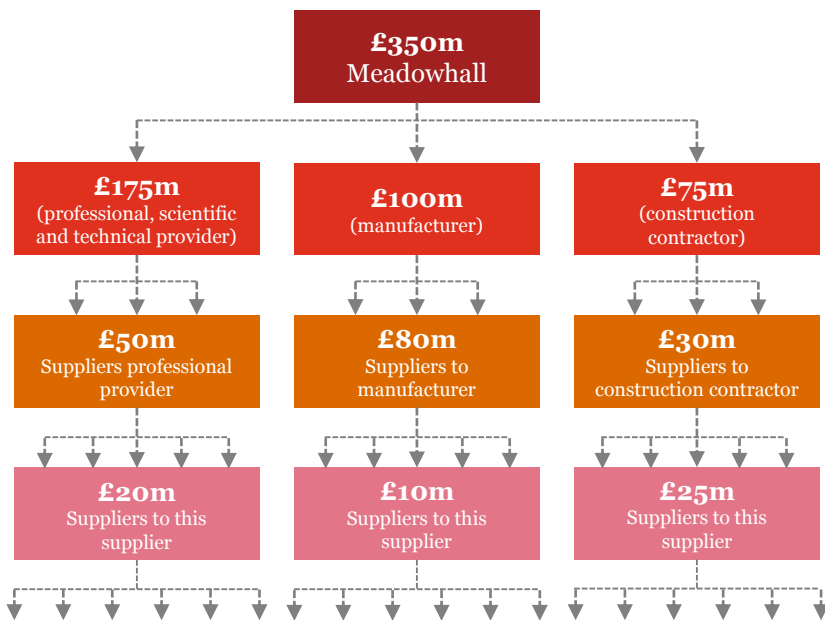
Source: PwC

Key notes and assumptions

- All financial data presented are in nominal values, unless indicated otherwise.

- All analysis is done in gross terms and we have not assessed the net contribution of Meadowhall to the economy.

- We have confined our study to the UK level impact, this does not include any economic or other impacts that may occur overseas.

- Where we have used data directly provided by British Land, or any other party, we have not audited or verified the data.

- British Land mapped the majority of its supplier expenditure to the relevant sector and region. For occupiers, we assumed expenditure to be apportioned in line with the retail sector inputs to obtain total expenditure by sector and by region.

- We have used an integrated two-region model to estimate Meadowhall's socio-economic contribution to the UK. This model is linked and the results presented are, therefore, inclusive of direct expenditure in each geography and any additional spend through feedback loops between geographies.

Tax contribution approach (1/2)

Overview

The PwC Total Tax Contribution (TTC) Framework provides a standardised methodology for companies to measure and communicate all the taxes and contributions that they pay.

The framework makes a distinction between taxes borne by the company and taxes collected.

- Taxes borne are the company's own contribution in taxes that impact their results.

- Taxes collected are those that the company administers on behalf of government and collects from others. Taxes collected will have an administrative cost for the company and will also have an impact on the company's business.

The Framework categorises taxes into five tax bases, the "5Ps", namely: Profit taxes, People taxes, Property taxes, Production taxes, and Planet (Environmental) taxes. This allows for an understanding of what type of taxes are most relevant to a particular company or sector, and how total contribution varies across these 5 different categories.

Tax contribution approach (2/2)

Approach to estimating tax contribution arising directly from Meadowhall's activities

The tax contribution resulting directly from Meadowhall's activities is made up of contributions from the landlord, the managing agent and the occupiers.

- British Land and the managing agents were able to directly report on all relevant taxes paid for each financial year,

- For the occupiers, estimates were constructed for employment taxes (including Pay-as-you-go [PAYE] and National Insurance Contribution [NIC]) using relevant indicators, and actual data was used for business rates. Corporation Tax was excluded as this is paid at a company rather than store level, so is not relevant to this study. Net Value Added Tax (VAT) was also excluded.

Table 3: Methodology for estimating employment taxes for occupiers

Step	Description
1	Determine tenant headcount, staff costs and part-time/full-time split
2	Estimate base line full-time and part-time wages
3	Multiply by ONS average part-time and full-time hours
4	Input annual wage estimates to tax calculator by financial year
5	Summarise for total employment taxes

Approach to estimating tax contribution arising from Meadowhall's supplier activities

Tax contributions from supplier activities are estimated using an Input-Output model.

This is done in a similar manner to the method used in calculating total supported employment. Through analysing Her Majesty's Revenue and Customs (HMRC) tax receipts we are able to estimate effective tax rates by sector for all UK taxes covered in the TTC framework.

We can apply these rates to the total production value stimulated, and hence estimate the total taxes in the supply chain by sector associated to this. This allows us to estimate the tax contribution that results from economic activity at Meadowhall for the most recent financial year.

Social contribution approach (1/2)

We estimated Meadowhall's social contribution by considering the following five indicators:

- Local employment

- Training

- Apprentices

- Health & Safety (H&S)

- Community programme

Meadowhall's social contribution manifests itself in different ways. Meadowhall creates positive social impact through training courses designed to upskill staff and increase their potential future earnings, in contrast, H&S incidents such as injury or illness lead to a negative social contribution.

Local employment examines the number of job opportunities created that are taken up by Sheffield City Region residents, while many community initiatives are aimed at benefiting the immediate surrounding region.

Much of recent charitable activity has been in conjunction with national charities (e.g. The British Heart Foundation) and as such the reach of that indicator goes beyond the regional boundary. Similarly, The Source Skills Academy is a training and development centre enabled by Meadowhall that provides training opportunities to people at Meadowhall, across Sheffield, and all over the country.

Social contribution approach (2/2)

Training and community programme

In the case of training and Meadowhall's community programme, we reported on data directly supplied during our consultations and were not required to perform any modelling or estimation.

Local Employment

In order to understand the number of job opportunities created for Sheffield City residents required an understanding of the home location of those currently employed at Meadowhall.

The managing agent shared postcode data for all of their staff over the last five years, allowing us to map this data against Sheffield City Region post codes and determine the proportion of their staff in the Sheffield City Region .

For occupiers, we were able to use a staff travel survey, based on a subset of 500 tenant staff to estimate the proportion of staff that live locally, and apply this to the total staff numbers to deliver an overall estimate.

Health & Safety

The Health and Safety Executive (HSE) reports on company H&S under the following three buckets:

1. Fatalities

2. Non-fatal injuries

3. Work-related illnesses

Meadowhall was able to report on the above for all but tenant work-related illnesses. By applying the HSE retail sector average to headcount figures we were able to estimate the remaining data gap.

By applying sector averages for both illnesses and injuries to our Input-Output model we were also able to estimate the H&S impact attributable to Meadowhall in its supply-chain activity (the indirect effect).

Environmental footprint approach (1/3)

In order to provide an assessment of Meadowhall's wider contribution, we estimated Meadowhall's environmental footprint by considering the following indicators:

• Carbon emissions (greenhouse gas emissions measured in CO2-e)

• Air quality (NOx, PM10 and PM2.5 emissions)

• Water use

• Waste generation

Waste generation and water use analyse both on-site use by the manging agent and occupiers, as well as indirect use associated with the economic activity generated in the supply chain.

To analyse total carbon emissions we have calculated the carbon footprint of Meadowhall, accounting for on-site carbon emissions, supply chain emissions, and those enabled by Meadowhall, such as emissions from car travel to and from the shopping centre. We also estimated NOx emissions from Meadowhall energy use.

Car travel has further impacts on the environment through air pollutants released, including NOx, PM10 and PM2.5, which are known to have adverse health impacts. To complete the environmental footprint, we estimated the significance of these emissions as well.

Environmental footprint approach (2/3)

Energy use and associated carbon and NOx emissions

Energy use was estimated in a similar manner, by breaking down floor space into a number of detailed categories and applying building-type benchmarks from The Chartered Institution of Building Services Engineers (CIBSE). CIBSE gives estimates for both typical and good practice buildings. We have used the typical benchmark based on Meadowhall's D rating for energy efficiency from its Energy Performance Certificate received from HM Government in FY15.

We used DEFRA company reporting emissions factors to estimate the total direct carbon footprint for Meadowhall. This included the carbon emissions measured by the managing agent for all sources from the Common Parts Area (CPA) plus the carbon emissions associated with the estimated energy use of occupiers (electricity and fossil fuel), and those from public travel to and from Meadowhall.

Table 4 below list the carbon emission factors used for FY15.

Table 4: kg CO2-e per kWh

Type	Activity	Scope	2015
Electricity	Electricity Generated	2	0.46219
	Transmission and distribution	3	0.03816
	WTT - UK electricity (generation)	3	0.06888
	WTT - UK electricity (T&D)	3	0.00569
Gaseous fuels (Natural Gas)	Fuels - Energy - Gross CV	1	0.18445
	WTT - Energy - Gross CV	3	0.02483

DCF Carbon Factors	Unit	2015
Car		
Average petrol car	km	0.19126
Average diesel car	km	0.18232

Source: DEFRA

We estimated NOx emissions from direct energy use by multiplying energy use in MWh by Life Cycle Analysis (LCA) factors for each energy source. These LCA factors were taken from *ecoinvent*.

Energy cost savings were calculated by British Land by multiplying the decrease in kWh between reporting years, and applying current year cost factors. For more, see the British Land Sustainability Full Data Report 2015 Reporting Criteria: www.britishland.com/sustainabilityreport

Visitor car use and associated carbon and other emissions

In addition to Meadowhall's carbon emissions from direct energy use, we analysed the impact of Meadowhall visitors and employees travelling to and from the site. Table 5 summarises the 4 key steps of the process used to estimating the associated carbon and air pollutant emissions.

Table 5: Key steps in car use estimation

Step	Description
1	Estimate total drive time by looking at the annual number of cars and the average drive time over the period
2	Estimate total distance travelled using average speed statistics from government annual statistics
3	Split between car types using DEFRA Fleet statistics on types of car on the road
4	Estimate carbon emissions and air pollutants resulting from total travel

Environmental footprint approach (3/3)

Water use

Water use by visitors and the managing agent was provided to us directly. In order to arrive at an accurate estimate for water use by occupiers we developed a bottom-up approach using previous research and industry specific benchmarks. The benchmarks used are provided in Table 6.

Table 6: Water use benchmarks

Tenant type	*m³ / sq m*
Restaurant	14.3
Fast food chain	7.5
Café	10.7
Department store with café	0.5
Staff toilet only	-

Source: AWWA, PwC analysis of Corporate Sustainability reports

Waste generation

Nearly all waste generated on site is handled by the managing agent. Therefore, detailed data on the tonnage of waste generated in both the CPA and by occupiers was available and included directly into our report.

Rest of the Supply chain environmental footprint

We developed an environmental model that maps the environmental impacts for each sector in our Input-Output model. By incorporating this as an extension to our model we were able to estimate the impact of Meadowhall's supply chain activities on carbon emissions, water consumption and waste generation that weren't already covered in the other parts of the analysis.

Contextualisation of findings

In addition to assessing Meadowhall's contribution, we performed a Sheffield baseline study to contextualise our findings. We considered economic, tax, social and environmental indicators for the following geographies:

- Meadowhall ward and surrounding wards;

- Sheffield City Council

- Sheffield City Region Local Enterprise Partnership / South Yorkshire / Yorkshire and The Humber

- England / UK

Where possible, we have tried to find comparative data for the same geographic definition as used in our impact assessment. However, in some cases this wasn't possible due to third party data availability.

The key data sources used for this baseline assessment are summarised in Table 7.

Table 7: Key data sources used for Sheffield City Region baseline assessment

Theme/Indicator	*Source*
Economic	
Gross Value Added	Office for National Statistics (ONS)
Tax	
Business rates and council tax	HMRC, Sheffield City Council
Social	
Employment data	NOMIS, ONS
Index of Multiple Deprivation	Department for Communities and Local Government
Health & Safety data	Health & Safety Executive (HSE)
Environmental	
Carbon emissions	Department for Energy and Climate Change (DECC)
Waste	Department for Environment, Food and Rural Affairs (Defra)
Air quality	Sheffield City Council, Defra
Water	Yorkshire Water