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A road for regional recovery? The socio-economic impacts of local spending on the A465 road improvement scheme in South Wales

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Introduction

In 2015, the Welsh Economy Research Unit (WERU) was commissioned by Arcadis (Client Advisor to Welsh Government) to prepare six-monthly dashboards highlighting the socio-economic impacts of the A465 Heads of the Valleys road improvement project. The five-year project involves estimating the direct, indirect (supply chain) and induced (household) economic benefits derived from spending on the road improvement. To do so, longitudinal data was collected on spending, wages, employment and local procurement from the managing contractors for the road development. This data is used within the Input-Output framework for Wales to provide the estimated economic benefits for local and regional economies. These findings are presented in terms of output, gross-value added (GVA) and full-time equivalent (FTE) jobs supported in Wales. The approach is supported by qualitative insights, using case studies to provide information on the wider economic benefits from sub-contractor's perspectives. These qualitative insights can be overlooked when evaluating policy and practice surrounding transportation appraisals (Marsden & Reardon, 2017).

A transport infrastructure project of this scale and duration provides a notable boost to the regional construction sector. As such, the research explores the extent to which investments in transport infrastructure projects can act as an instrument to stimulate socio-economic development in parts of Wales. In particular, the project investigates how pooling people and resources for a prolonged period may affect local supply chains, stimulating demand and spending in other parts of the economy, and supporting employment. While the road development is expected to provide economic benefits once complete, it is important that these interim 'in-process' benefits are not ignored. The periodic dashboard allows policymakers and industry stakeholders to examine the economic benefits gained from spending on the road improvement process, providing a snapshot of the impacts created by the construction and infrastructure work at different parts of the process, and revealing links to changes in local labour markets associated with the road development.

Transport infrastructure improvements in Wales

In Wales, improvements to road transport connectivity feature strongly among infrastructure priorities, with strategies focusing around improving capacity while reducing congestion and emissions (National Infrastructure Commission for Wales, 2018). Pivotal to these commitments is a focus on connecting and supporting parts of Wales where these is less advantageous access to economic opportunity. Public spending on infrastructure has gained increased attention in recent years, particularly in the wake of decisions to suspend a number of high-profile projects, such as the M4 Relief Road and the Wylfa Nuclear Plant. These decisions have led

to a period of uncertainty for the regional construction sector. While the regional construction sector has experienced prolonged periods of growth, recent forecasts of output and employment estimates are more modest, reducing the sector's estimated rate of growth over the next four-year period. For example, the Construction Industry Training Board (CITB, 2019) predicts output growth to be 0.5% and employment at 0.7% (CITB, 2019) for the construction sector in Wales over the four-year period to 2023. These estimates are down significantly from the previous year, where the average output growth was previously forecast as high as 4.6% per annum and employment growth at 2.2% between 2018 and 2022 (CITB, 2018). Infrastructure is where some of the key hits are occurring, with forecasts predicting no significant growth in the 2019 report, in contrast to previous predictions putting the average growth at 14.2% a year in the 2018 report (CITB, 2018b) and as high as 25% annual growth in the 2017 report (CITB. 2017). It remains unclear how these fluctuations may influence the economy, labour markets and supply chains of the regions where the investment was set to take place.

The wider economic benefits of local spending on transport infrastructure projects

There is a longstanding recognition that investments in public infrastructure can help to stimulate economic growth (Farhadi, 2015; Holmgren & Markel, 2017) with improvements to accessibility, connectivity and capacity providing prospects for productivity improvements (Rokicki & Stępniak, 2018). Better road infrastructure can bring direct time and cost savings for workers and businesses (Linneker & Spence, 1996), as well as creating direct and indirect employment opportunities, sparking new investment, opening up national and international trading opportunities and strengthening supply chains. Yet, the benefits are not always experienced equally across regions and across industries. Different industries benefit to greater and lesser extents, with certain industries growing because of reduced transportation costs, while others might contract if industries relocate elsewhere following the improvements to connectivity (Chandra & Thompson, 2000). The development of the A55 in North Wales is a good case study of these types of relocation effects (see Bryan et al., 1997).

Additional economic effects post-construction include improving productivity (Farhadi, 2015), agglomeration benefits (Melo et al, 2013), market expansion, and stimulation of further development (Pugh & Fairburn, 2008). Others have questioned the extent that transportation infrastructure benefits local and regional economies given the propensities of benefits to spill over into other industries and economies (Chandra & Thompson, 2000). Moreover, it is difficult to isolate the benefits to the transport infrastructure spending itself, with *ex post* evaluations of road improvements having real difficulty positing counterfactual situations. Other outcomes are also difficult to measure, for example regeneration or securing of public-private involvement (Vickerman, 2007).

Much of the existing research and data focuses around evaluating the long-term outcomes for local and regional economies once the construction work is complete, such as in the economic assessment as described in the Design Manual for Roads and Bridges.[1] However, these assessments omit the interim in-process benefits derived from regional spending on transport infrastructure. Short term gains include creation of employment on schemes, employment safeguarded and created in suppliers to road developments and more subtle spill over effects into local communities. This paper build on an evolving body of literature that is beginning to focus on the construction and developmental stages of the infrastructure projects, focusing on how infrastructure spending provides opportunities for local economic development.

The Case: A465 Heads of the Valley road in South Wales

The A465 Heads of the Valleys road in South Wales is a strategically important route forming part of the Trans European Transport Network. It extends from Abergavenny at its eastern end, joining the M4 at Llandarcy. The route

provides an alternative east to west route from the Midlands to west Wales and the Irish ferry ports beyond. Much of the original route, which was constructed in the 1960's, is now considered as substandard and the Welsh Government objective is to dual the road in its entirety to modern highway standards, together with providing grade separated junctions. To facilitate delivery, the National Transport Plan divided these works into six sections. The scheme considered in this paper is the A465 Section 2, which extends for 8.1km from Brynmawr in the West to Gilwern in the East. This is the fourth section of these improvements to be delivered. The A465 is considered to be critical to the social and economic regeneration of the Heads of the Valleys area, opening up access to key services, jobs and markets supporting inward investment to the area.

their designers (Jacobs formerly CH2M / Atkins & RPS) developed the scheme which was then presented at Public Local Inquiry in 2014 prior to Orders being made. Following a successful Public Inquiry, Costain was awarded the NEC target cost Design and Build contract to deliver the construction phase, which in 2020 is nearing completion.

The aim of the scheme is to upgrade the existing three-lane carriageway to a two-lane dual carriageway to improve the safety of a notoriously dangerous road. Figure 1 shows an aerial view of part of the A465 Section 2 works. The Jack Williams Gateway Bridge shown Figure 1 has since been completed and was opened to traffic in 2018. The bridge is named after a local World War One hero.

Figure 1: Aerial view of part of the A465 Section 2 works

Image: Bill Hiller Photography

The Section 2 phase of the scheme has been developed through an early contractor involvement (ECI) procurement route, with Costain being appointed as the ECI contractor in 2011. During the ECI phase Costain with

Dashboards and methodology

The case study combines longitudinal data on spending, wages, employment and procurement from the project from 2015 to 2019. Multiple data sources were used in the

analysis, compiled from primary (managing contractor and sub-contractors spending data) and secondary (Office for National Statistics) sources. Costain provided details of spend on plant and materials, other goods and services, and procurement routes as well as wage bills associated with the direct and temporary Costain staff. Costain also provided information on sub-contractor location, activity and spend and estimated sub-contractor person weeks on site. Selected sub-contractors also provided material for the team to develop a series of qualitative case studies, detailing activities that contribute to the social and economic benefits for the region while the improvements were taking place. These case studies illustrate sub-contractors' perspectives of the short and longer-term benefits of the project.

The spending data provided by Costain and subcontractors was placed into the Input-Output framework in order to estimate the interim benefits for local and regional economies. The economic impact assessment process is summarised in Figure 2, and with this process repeated at six monthly intervals throughout the project. Using the framework of the Input-Output tables for Wales, the indirect (supply chain) and induced-income (household) effects of the road spending was estimated.

The outputs from the process summarised in Figure 2 was a periodic snapshot of the output, GVA and FTE jobs supported in Wales as a result of the road transport spending. The process demonstrated in particular the scale of the indirect and household effects associated with the process of road improvements.

Keeping track of the benefits to local economic development

This section sets out data from the most recently completed dashboard, which captures reported spend on Section 2, for the six-month period to the end of March 2019. These benefits are broken down into direct benefits, indirect benefits (induced and household), and wider and accumulative benefits over the project duration.

Direct impact (6 months to March 2019)

Reported gross total spending during this period totalled £25.1 million, of which 68% (just over £17m) was estimated to have remained within Wales. The bulk of the total and local spend is in the construction sector with more than 70% of this construction spend remaining within Wales (Table 1). Table 1 shows other areas of local spend include renting of equipment/machinery and business & professional services. During the full period since 2015, around 70% of total direct spend has been retained in Wales.

Figure 2: Estimating economic impacts using Input-Output analysis

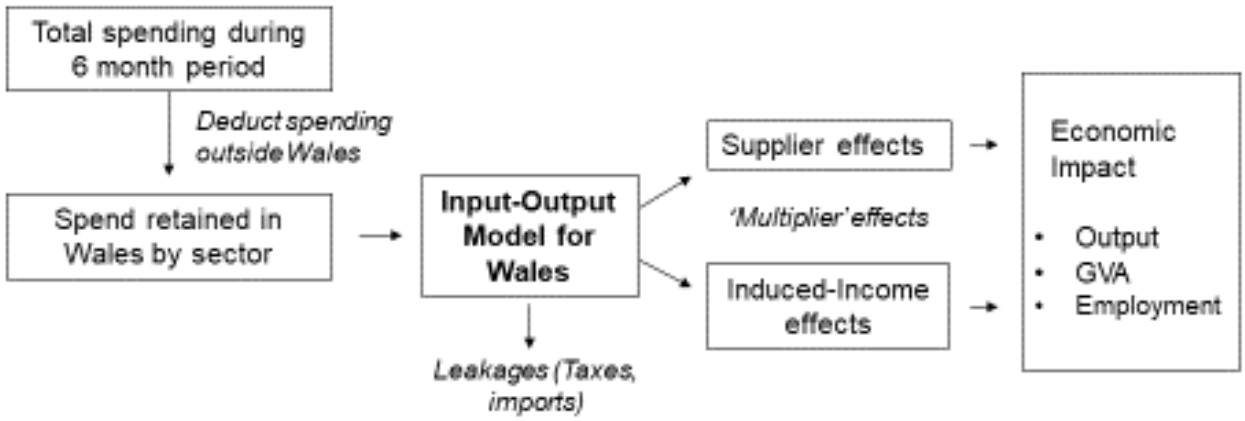

Table 1: Estimated total spending by key sectors (September 2018-March 2019)

Sectors	£m	% of spending in Wales
Primary	1.8	83
Cement etc.	0.2	14
Other manufacturing and utilities	1.7	66
Construction	13.0	71
Wholesale/retail/distribution	0.6	12
Renting of equipment/machinery	3.9	69
Business & professional services	3.8	63
Other services	0.2	73
Total	**25.1**	**68**

Note: Totals may not sum due to rounding

Indirect benefits (6 months to March 2019)

The direct spending on goods and services summarised in Table 1 supports other Welsh activity. In meeting the demands of the road development project, these suppliers also have to buy goods and services in the regional economy, therefore creating multiplier or ripple effects. Using the Input-Output framework the initial £17.2m of local spend during the most recent period studied, is estimated to supported a further £9.9m in regional output through additional activity in the supply chain, and from income being spent across other sectors. The total output effect of around £27m is shown by sector in Table 2.

The total output effects are translated into GVA and employment impacts in Table 2.

More than £12m of direct and indirect GVA is estimated to have been supported by the road project during the most recent period, with much of this linked to the wages and salaries directly and indirectly supported by the improvement works. Almost 280 jobs (person years/FTEs) were supported during the most recent data period, with these including Costain employees, the direct onsite subcontractors, and jobs elsewhere in the economy, such as in wholesale, retail, distribution and hotels; banking, finance and renting of movables and primary extractive industries. While the bulk of the benefits emerge within the construction sector, the research shows the wider socio-economic benefits of these investments for the labour market and regional economy.

Wider benefits

The research is supported by qualitative insights provided by contractors, training suppliers and local case study businesses aligned to the improvement scheme. The benefits exemplified in the case studies fall into broad themes of *employability, training, opportunity creation* and *engagement*.

A recurrent finding from the local construction case studies was the improved ability to create and develop opportunities, in particular when successfully bidding for future projects. Similarly, the businesses noted improvements in the ability to invest, expand, train and employ more workers. For example, one business highlighted an increase in employees from three at the start of the project, to 35 close to the project's completion. The ability to expand the workforce and expertise offered was particularly important for smaller firms situated in the local areas, helping to provide a boost to their own performance but also strengthening the local supply chains. Linked to the apprenticeship and training examples detailed below, local businesses also noted the importance of establishing internal and external training and developing the skill set of its current and future workers.

Table 2: Total impact in Wales by sector (September 2018-March 2019)

Sectors	Output (£m)	GVA (£m)	Employment (FTEs)
Primary & Extractive	1.8	0.7	25
Food/Textiles/Other manufacturing	1.8	0.6	16
Cement	0.3	0.1	2
Metals/machinery	0.8	0.2	4
Energy/Water	0.7	0.1	1
Construction	11.0	5.5	151
Wholesale/Retail/Distribution/Hotels	2.1	1.0	21
Banking/Finance/Renting of equipment/machinery	5.0	2.6	29
Other business & professional services	3.0	1.2	21
Public & other services	0.6	0.3	7
Total	**27.0**	**12.5**	**276**

Note: Totals may not sum due to rounding

Apprenticeship and training opportunities were also widespread. Examples include Construction Taster Programmes such as the Welsh Government's LIFT programme. The taster programme was designed to enhance employability skills and provide necessary experience for unemployed people in local areas. In addition to the practical experience, the programme provided access to Continuing Professional Development (CPD) construction training. Moreover, Costain and its suppliers and subcontractors have offered 69 apprenticeships linked to the Section 2 improvements, to young people in South Wales, covering engineering, accounting, groundwork and managerial roles. Costain and its suppliers have also worked with the CITB, setting up a National Skills Academy in 2015.

Building on these alliances, the Welsh Apprenticeship Alliance was created in 2017. The alliance between Arcadis, Welsh Government and the Institute of Civil Engineers provides access into engineering degrees for those facing barriers to higher education. The scheme gains around 25 apprenticeships each year, working on projects such as the A465 improvements. These apprenticeships foster engagement between local businesses and educational providers. There have also been attempts to narrow gender divisions within the sector, with the Chwarae Teg and Agile Nation 2 Programme providing support for over 20 female employees in Costain when taking up leadership and management roles within the construction industry. Engagement was also supported through the establishment of a Costain Small and Medium-sized Enterprise (SME) Supply Chain Academy, facilitating in-house expertise and training to 21 Welsh SMEs. These utilised a mixture of CITB accredited courses on business, personal and engagement skills. These findings point to the additional labour market benefits being attained through access to apprenticeship and training opportunities. Combined, the training and employment opportunities are providing important skills development and career progression for local workers. These apprenticeships and training opportunities provide some of the longer-term legacy impacts from the road improvement scheme, while also tackling some of the construction sector's and societies more challenging hurdles.

Summary: Transport infrastructure helping to overcome regional disparities

Road infrastructure schemes rely on large injections of public investment. With these large sums comes a need for transparency in how money is spent and an understanding of

the potential local impact. These impacts are often understood in improvements to road safety and reduced travel times. Where literature has focused on local economic development implications the emphasis has been on the long-term effects associated with greater accessibility and connectivity provided by the physical infrastructure. While these benefits are important, the socio-economic impacts occurring *during* the development and construction of the project are often overlooked.

This research shows some of the ongoing benefits to local communities and the economy attained during the period over which the construction occurs. Moreover, the analysis points to legacy benefits for communities, workers and the economy through the provision of investment, heightened demand and skill development,that can be missed in more conventional economic assessments.

Acknowledgement

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Endnote

1. For information see http://www.standardsforhighways.co.uk/ha/standards/dmrb/

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