



**Wales Centre for Public Policy**  
**Canolfan Polisi Cyhoeddus Cymru**

# Remote working

**Isabelle Carter and Craig Johnson**

February 2021



# Our Mission

The Wales Centre for Public Policy helps to improve policy making and public services by supporting ministers and public service leaders to access and apply rigorous independent evidence about what works. It works in partnership with leading researchers and policy experts to synthesise and mobilise existing evidence and identify gaps where there is a need to generate new knowledge.

The Centre is independent of government but works closely with policy makers and practitioners to develop fresh thinking about how to address strategic challenges in health and social care, education, housing, the economy and other devolved responsibilities. It:

- Supports Welsh Government Ministers to identify, access and use authoritative evidence and independent expertise that can help inform and improve policy;
- Works with public services to access, generate, evaluate and apply evidence about what works in addressing key economic and societal challenges; and
- Draws on its work with Ministers and public services, to advance understanding of how evidence can inform and improve policy making and public services and contribute to theories of policy making and implementation.

Through secondments, PhD placements and its Research Apprenticeship programme, the Centre also helps to build capacity among researchers to engage in policy relevant research which has impact.

For further information please visit our website at [www.wcpp.org.uk](http://www.wcpp.org.uk)

## Core Funders



**Cardiff University** was founded in 1883. Located in a thriving capital city, Cardiff is an ambitious and innovative university, which is intent on building strong international relationships while demonstrating its commitment to Wales.



Economic  
and Social  
Research Council

**Economic and Social Research Council (ESRC)** is part of UK Research and Innovation, a new organisation that brings together the UK's seven research councils, Innovate UK and Research England to maximise the contribution of each council and create the best environment for research and innovation to flourish.



Llywodraeth Cymru  
Welsh Government

**Welsh Government** is the devolved government of Wales, responsible for key areas of public life, including health, education, local government, and the environment.

# Contents

<b>Summary</b>	<b>4</b>
<b>Productivity</b>	<b>6</b>
<b>Towns and Urban Centres</b>	<b>9</b>
<b>Employment</b>	<b>13</b>
<b>Business support</b>	<b>16</b>
<b>Transport</b>	<b>20</b>
<b>Conclusion</b>	<b>22</b>
<b>References</b>	<b>24</b>

# Summary

- Evidence from experts and surveys of businesses and workers suggests that the likely outcome in the future is a blend of office and remote working.
- Remote working does not appear to have damaged productivity, and has benefitted some workers who have appreciated the flexibility.
- However, in-person contact builds social networks, social capital and trust, and this is important for productivity in the long-term. A blended approach could enable the best of both worlds.
- One third of workers in Wales are in low-paid sectors, and often the least able to work remotely. Some groups will be more negatively impacted by changes in work patterns.
- Businesses have been affected by remote working in different ways, with some able to adapt easily, and others either phasing returns to normal activity or having to close. Supporting businesses through to a point where normal activity can resume may still be the best course of action, while regularly surveying businesses to understand their needs and intentions.
- Welsh cities have been among the slowest to recover footfall as initial restrictions were eased, and a long-term shift towards remote working may relocate some city centre retail and hospitality to towns and suburbs.
- However, it remains too early to predict how transformational these changes will be. History has shown that cities and urban centres tend to survive crises. Monitoring should inform future decisions.
- Evidence suggests caution before making any significant changes to transport infrastructure investment. The current short-term decline in public transport usage is not the best indicator of long-term trends, and it is too soon to be making significant changes to long-term investment.
- While there are some instances in which sector-specific support will be helpful, often a more appropriate policy action is to think about creating the right conditions for businesses, and focusing support on helping businesses to adapt and innovate as required to be resilient.
- Increased and sustained monitoring of the impacts of remote working is necessary to inform future policy decisions.

# Introduction

The Welsh economy is experiencing a profound and unprecedented shock due to the Coronavirus pandemic. One of the consequences of lockdowns and public health restrictions has been requiring people, where they can, to work from home. UK data suggests that while just 5 per cent of workers worked from home prior to March 2020, this increased to approximately 43 per cent at the beginning of lockdown (Felstead and Reuschke, 2020).

While this percentage is unlikely to be sustained once the Coronavirus pandemic is more manageable in the medium- to long-term, it is reasonable to expect that more people will work remotely more of the time than they did prior to March 2020. This may be from home, or from a designated workspace in a community, and may be full time or a blend of remote and office working. However, across the whole of the Welsh economy, the opportunities for working remotely may be limited. Wales has a greater proportion of workers on low pay and people who are unable to work from home than other parts of the UK (Rodrigues & Ifan, 2020; Resolution Foundation, 2020). The Welsh Government has recently announced a 'long-term ambition to see around 30% of Welsh workers working from home or near from home, including after the threat of Covid-19 lessens' (Welsh Government, 2020).

The Minister for Economy, Transport and North Wales and the Deputy Minister for Economy and Transport have asked the Wales Centre for Public Policy to synthesise the evidence on the likely implications of remote working for the Welsh economy. Key issues include the implications for:

- Productivity
- Towns and urban centres
- Employment
- Business support
- Transport

The report draws together the evidence available so far from Wales, the rest of the UK and internationally – with a particular focus on small and similar nations – to understand how remote working may impact various aspects of economic activity in the future.

# Productivity

## Has the increase in remote working improved or damaged productivity?

Productivity matters because it reflects the ‘observable outcome of all economic relationships between people, firms, organisations and institutions’ (McCann, 2018: 4). The Welsh economy has a long-term problem of low productivity, and lags behind the UK average (but it is more in line with regions outside of London and the South East). A key question is whether the increase in remote working has increased or further damaged productivity, and what would be the impact of sustaining some form of remote working in the future.

Research with a treatment and control group undertaken prior to the pandemic suggested that homeworking improved the level of output, both in terms of hours working and the intensity of the work (Bloom et al., 2015). The authors found that workers at home spent more time logged onto the system and were more productive when using it. Follow-up interviews with participants suggested that they enjoyed the convenience and peace of being at home. Levels of job satisfaction rose, and job turnover fell. It is important to note that the treatment group was self-selected: they chose to work from home. The authors found that people who have established social lives, such as older workers, married workers and parents, were happier working from home. Younger workers and those wanting more social activity tended to prefer an office environment.

This study focused on people who had already worked in an office environment with existing colleagues and had suitable facilities in their home. We know far less about the effect of enforced and widespread remote working on productivity levels. An unrepresentative and self-selecting sample gathered by Rubin et al. (2020) suggests that a majority of people were less productive working from home than they were prior to the pandemic, although a Canadian study found the opposite (Saba et al., 2020). Research by Valet (2020) suggests that workers and students face difficulty with concentration and motivation over time, which physical workplaces help to strengthen. A survey by the Chartered Institute for Professional Development (2020) suggests equal proportions of change in productivity during the initial lockdown. Baudot and Kelly (2020) studied workers in the United States, finding that respondents’ perceived improvements in productivity both for themselves and their colleagues. They also found that respondents wanted to work remotely more than they did before the pandemic. Both improvement in productivity and desire to work

remotely was positively related to whether they had already worked remotely prior to the pandemic.

DeFilipis et al. (2020) find that remote working led to significant increases in meetings and communications by employees. Through a study across different continents, they found increases in the number of meetings per person (13 percent), the number of attendees per meeting (14 percent), but that the meetings were shorter (20 percent). They also found that people worked longer (by approximately three quarters of an hour each day), although this is not increased productivity.

The ESRC-funded Understanding Society Covid-19 Study, hosted by the University of Essex, has conducted surveys throughout the pandemic. Comparing behaviour in March/April with January/February, approximately forty per cent reported that they got as much work done as prior to the pandemic, compared to approximately 30 per cent each saying either that they got less or more done. Broadly speaking, homeworking during the initial lockdown did not have a significant effect on levels of productivity. Where workers suggested lower levels of lockdown, this was generally due either to having less work to do or having other responsibilities (such as childcare). Felstead and Reuschke (2020) used regression analysis to find that those with greater commitments at home – such as housework and childcare – reported lower levels of productivity.

Research early in the pandemic suggested that wanting to work remotely was a positive indicator of productivity. The Understanding Society Covid-19 Study suggests that most employees who worked at home would like to continue working at home in the future in some capacity, with approximately half saying they would like to work from home often or all of the time. This applies to both those who had done it previously and those who experienced home working for the first time this year. It suggests that a 'new normal' might be higher levels of home or remote working in the future. Felstead and Reuschke (2020) find selection bias in relation wanting to work from home and reporting better productivity. Approximately two thirds of employees who reported better productivity working from home wanted to work from home in the future, while just six percent of employees who did not want to work from home in the future suggested that they had higher productivity at home.

The rapid nature of the research presents difficulties in building an accurate picture, but it suggests that productivity was not significantly hampered during the initial lockdown. Felstead and Reuschke (2020: 20) argue that:

**Allowing employees to work at home, if they want to, may increase not reduce productivity... many employees have got used to working at home... furthermore, if those who want to continue working at home in the future are allowed to do so, productivity may be boosted by a sustained increase in the prevalence of homeworking.**

## How will this sustain through the winter and beyond?

However, while perceptions of productivity as output may have performed admirably since March 2020, other key features of long term productivity performance are innovation, creativity and knowledge diffusion. Some jobs will be easier to do remotely than others. Bloom et al. (2015) suggest that the more automated the work, the greater the benefits, suggesting that remote working could be detrimental to innovation and knowledge diffusion.

Florida, Rodriguez-Pose and Storper (2020) argue that in-person contact at work builds social networks, social capital and trusting relationships, and that these help to build and maintain complex projects. This may especially be the case for creative and high-skilled work. Research also suggests that spatial clusters of firms, suppliers and service industries improves regional competitiveness (Verdú and Tierno, 2019). The long-term implications of remote working for innovation, knowledge diffusion and productivity performance are still unclear. However, there is little evidence that remote working can successfully establish networks and socialise new colleagues in areas of work that depend on tacit knowledge, trust and 'reading between the lines' (Florida, Rodriguez-Pose and Storper, 2020).

A study commissioned by Microsoft found evidence to support these arguments (World Economic Forum, 2020). They found supporting evidence for the claims that outputs and basic productivity had survived well since March 2020, but that innovation had been weakened. The issues were not due to technology or equipment, but the lack of culture, cohesion and collaboration that forms part of a daily routine where in-person interaction is the norm. Employees found their work culture strained, and reported feeling more like they were working in silos than they did previously. This led to concerns about new thinking, diffusion of knowledge and innovation (Felstead, et al., 2020).

The promising developments relating to coronavirus vaccines suggests that a return to the workplace may now be a question of when rather than if. Therefore, this may be a temporary blip that resolves itself as people either return to workplaces full time or in some blended fashion. There is little reason why a blended approach cannot generate an innovative environment. Indeed, for some people it may lead to more innovation, as they can contribute to creative discussions and build trusting



relationships some days, while getting tasks done and boxes ticked at homes on others.

## Towns and Urban Centres

### What are the possible impacts of remote working on footfall in city centres?

The public health measures to contain Coronavirus led to a significant reduction in footfall in Welsh towns and cities. Research by the Centre for Cities shows a reduction in footfall in Wales and the rest of the UK in 2020 compared to 2019, both as a result of remote working and restrictions on retail and hospitality. The reduction in footfall in Wales at the start of the pandemic mirrored the fall seen across the rest of the UK. However, as the pandemic progressed into the summer of 2020 the reduction in footfall was greater in Wales than in the UK overall. In August and September footfall in Wales increased and was, at points, higher than both the UK overall and the same figure for Wales in 2019. Footfall in Wales declined again in late October and early November during the Welsh 'firebreak' lockdown (23<sup>rd</sup> October – 9<sup>th</sup> November 2020) (Office for National Statistics, 2020). Footfall in Wales increased in November following the end of the 'firebreak' but remained lower than in 2019.

While footfall in Wales has recovered somewhat from the dramatic decline experienced at the start of the pandemic, it has not yet returned to pre-pandemic levels (Barry, 2020). According to the Centre for Cities' high street recovery index for October 2020, Cardiff and Swansea were the worst and third worst cities in the UK in terms of footfall recovery (Centre for Cities, 2020). Although footfall in Wales continued to fall in the autumn of 2020, the rate of footfall decline in Wales' city centre shopping districts was slowing down which may suggest that a recovery in footfall will take place when restrictions are lifted and people's confidence in public health and safety improves (Barry, 2020).

The wider literature on remote working highlights changes to consumption patterns related to increased time spent at home as a driver of footfall reduction. Kang et al. (2020) and Relihan et al. (2020) suggest that online shopping and demand for click-and-collect and delivery services increased during lockdown periods and that these patterns of consumption have continued despite an easing of restrictions. Nathan and Overman (2020) and Mortimer et al (2020) argue that if increased levels of remote working continue in the long-term there may be a geographical shift in footfall from city centres to the suburbs as people spend more time at home or in their local area. Mortimer et al. (2020) argue that this is merely an acceleration of an existing trend of growth in suburban retail centres which was already reducing footfall and

demand for city centre shopping. As this pattern remains unclear, it is imperative that these changes are monitored to generate evidence to inform policy decisions in the Coronavirus recovery period and beyond.

It should be noted that much of the existing literature does not consider public perception of cities in the context of a global pandemic like Coronavirus. Therefore, it is also necessary to maintain an awareness of the impact that perceived safety or danger can have on workers and consumers' choice to return to the city as this will likely impact footfall volume in Welsh cities in the near future (Parady et al., 2020; Barrios and Hochberg, 2020). The timeframe under which people continue to face restrictions and social distancing in day-to-day life will also have significant implications for future footfall in Wales' city centres, however it is not yet clear when life will return to 'normal' (Nathan and Overman, 2020).

## What are the implications of this for office space and land use in urban areas?

Most studies agree that the Coronavirus pandemic will change cities and that the recovery phase will involve a 'new normal' in urban areas, however a large scale 'urban exodus' and the end of the city as we know it is unlikely (Couclelis, 2020). Instead, the design of cities and the use of urban space is likely to change as cities, and the people who live and work in them, adapt - although the exact nature and extent of these future changes is unknown (Batty, 2020).

House prices in the UK have risen during the pandemic in what has been described as a 'mini-boom' (Maunder, 2020). Modelling from the USA and Australia suggests that if levels of remote working were to permanently increase real estate prices in the urban core would fall while prices would rise in the periphery (Delventhal, et al., 2020; Lennox, 2020). Changes of this kind would have implications for urban planning and land use as well as for housing.

Another change in land use that may accompany a permanent rise in levels of remote working is an increase in 'urban sprawl' – an increase in the geographical extent of urban areas. Historically, remote working has not been thought to dramatically increase urban sprawl (Nilles, 1991 and 1996; Moeckel, 2017; Rhee, 2009). However, since the start of the pandemic increased urban sprawl has been presented as an expected by-product of new remote workers moving to city suburbs or towns near cities (Lennox, 2020). This change in theory may be a product of the unprecedented scale of remote working that has occurred during the pandemic. Before the Coronavirus pandemic, only 6% of workers were working from home regularly whereas by June 2020 43% of workers were working from home (Felstead & Reuschke, 2020). A change in working patterns on such a scale may produce

urban sprawl not associated with remote working at the levels seen prior to the pandemic.

Other research suggests that it is the towns near cities that are likely to see population growth as people move out of the city but want to remain somewhat close to the urban centre. Florida et al. (2020) argue that this city-to-town migration may result in and/or exacerbate the gentrification of suburbs in these towns as affluent city residents move in. This migration could, therefore, have an impact on house prices in towns near cities and result in increased inequality in these areas. It is unclear what the implications of such a trend would be for Wales given the limited number of cities but large numbers of towns that make up Wales' urban geography.

If remote working were to become a more permanent and prominent feature of work in Wales, organisations in cities and large towns are likely to be more affected than towns, as large companies that allow and/or encourage remote working are more likely to be concentrated in urban centres (Vilhelmson & Thulin, 2016; Reuschke & Felstead, 2020). This could produce differential impacts on cities and towns if changes in land-use, footfall etc. are more concentrated in city spaces. It could also produce differential experiences *within* urban areas if businesses in some areas of a city are more able to shift to remote work than others (Dingel & Neiman, 2020).

Back (BBC, 2020) highlights that the move towards home working during the pandemic has given businesses the opportunity to consider the costs and benefits of maintaining urban office spaces which may lead to some choosing to close city centre offices permanently and relocate or downsize. Biquelet-Lock (BBC, 2020) argues that changes to the way office spaces are conceptualised and used will affect cities differently depending on their size. If this is the case cities in Wales, which are relatively small compared to cities elsewhere in the UK, may be affected differently than their larger counterparts in England, Scotland and Northern Ireland. Wales could be less likely to be significantly impacted by these city-focused changes than the other UK nations.

For existing office spaces, the Coronavirus pandemic has brought into question current trends in office design and use. A number of studies (Samani & Alavi, 2020; Felstead & Reuschke, 2020; Parker, 2020) suggest that open-plan offices will need to be adapted to address worker concerns about the public health risk of shared spaces and that such concerns may lead to a decline the popularity of open plan office spaces. Conventional office spaces will also require adaptation to enable social distancing if this practice continues in the long term (Coleman, et al., 2020). Shared meeting spaces, kitchen facilities, conference rooms and other potential cross-contamination points could become less desirable features of office design (Parker, 2020).

Stromquist (2020) and Kretchmer (2020) highlight the cost of adapting all office spaces to enable social distancing as a key challenge to the future of the conventional city centre office. Research suggests that office occupancy may need to be reduced to 25-30% of pre-pandemic occupancy to facilitate the necessary public health measures to make returning to offices safe (Parker, 2020). The Welsh Government (2020) plans to invest in community hubs that people can commute to without extensive household mixing. While there is reasonable thinking behind the intention, there is little evidence to suggest that they will be any more effective in preventing transmission, or particularly wanted by workers or businesses. Commissioning data collection to better understand people's wants would be welcome.

In the immediate context of the Coronavirus pandemic there are significant public health concerns that present a barrier to the use of flexible working and hot desking facilities. Shared workspaces are vulnerable to cross-contamination which can place workers at risk. Clark (2020) argues that the pandemic may have brought about an end to hot desking because of these risks (and changes to workers' perception of risk) which make hot desking less desirable, however she also acknowledges that a total end to this mode of working seems unlikely.

## **What are the potential impacts of reduced office working on housing and the distribution of housing?**

Studies in the UK, Netherlands and modelling from Australia have found that under long-term remote working people are willing to accept a longer commute (i.e., move further out of urban centres) as they make the commute less frequently (Melo & Silva, 2017; de Vos, et al., 2018; Delventhal, et al., 2020). This could increase urban sprawl as people are willing to live further away from city centre offices which may promote the geographical expansion of suburbs and the urban periphery. Research from the UK, conducted between 2005-2012, found that the relation between remote work and willingness to accept a longer commute did not change over time, suggesting that if large scale remote working became permanent in Wales people would be willing to live further away from their workplace in the long-term (Melo & Silva, 2017).

Widespread and long-term remote working creates new demands for housing space. Reuschke and Felstead (2020) have found that new home workers (i.e. those working from home for the first time during the pandemic) were unlikely to have suitable space within their existing housing to work from home. The pandemic exacerbated this issue for many workers as they had to share working spaces with partners and/or children and other family members (Felstead & Reuschke, 2020; Reuschke & Felstead, 2020). The issue of shared space may become less salient in

the near future as children return to more normal patterns of school attendance. However, if remote working becomes a long-term behaviour many people may require dedicated workspace(s) within the home, therefore increasing demand for larger houses (BBC, 2020; Felstead & Reuschke, 2020). This seems particularly likely as people already working from home before the pandemic were more likely to be privileged members of the labour market who have dedicated spaces for work set up in their homes (Reuschke & Felstead, 2020).

## Employment

### What are the likely implications of home working for low-paid sectors such as hospitality and retail?

Around one third of workers in Wales are employed in low-paid sectors. More than half of these low-paid workers are employed in foundational sectors, such as retail, hospitality, tourism, care and food processing, identified in the Economic Action Plan (Webb, et al., 2018). Workers in these industries were particularly affected by the initial national lockdown instituted by Welsh Government. The Bevan Foundation (2020) found that during the initial lockdown period 211,500 people in Wales worked in sectors that were entirely shut down – most of these in low-paid sectors. 78% of workers in Wales' Accommodation and Food Services industries were furloughed as were 77% of workers in Arts, Entertainment and Recreation (Joseph Rowntree Foundation, 2020).

Low-paid workers are among the least likely to be able to work from home. This was the case before the Coronavirus pandemic and remained the case despite public health advice being that people should work from home where at all possible. Senedd Research (2020) has found that for those earning less than £20,000 a year in Wales only around 30% of key work tasks can be adequately completed at home (Rodrigues & Ifan, 2020). Therefore, many people on this level of income (or less) have to attend their work-site in person in order to do their job. In contrast the same research found that for those working over £40,000 a year more than half of key work tasks could be completed at home which enables high earners to work from home or adopt more flexible working practices (Senedd Research, 2020).

There is a distinct social inequality in the ability of workers to work from home. Specific groups including men, the better educated and those on higher pay are more readily able to choose to work from home. Women, disabled people, people under-25 and some Black, Asian and Minority Ethnic groups are more likely to be employed in low-paid sectors and as such would be more vulnerable to any impacts that a wider shift to remote working in Wales would have on low-paid sectors (Kabeer, 2020).

Marks (2020) argues that any long-term shift towards high levels of remote work could exacerbate inequalities within the labour market as homeworking privileges white collar workers who are more readily able to work from home.

Research by the IZA found that for low-paid workers flexible work arrangements were more likely to be offered under a contract which puts them at risk of earnings variation (Adams-Prassl, et al., 2020). The same study found that high-paid and skilled roles were more likely to offer flexible working alongside a fixed salary which protects these workers from the earnings risk experienced by low paid workers. This study also found that changes to minimum wage resulted in an 7pp increase in the proportion of flexible jobs available at low wages in the UK between 2014 and 2019 (Adams-Prassl, et al., 2020). However, the growth in low paid flexible job vacancies was highest for non-salaried positions which already made up the largest proportion of low paid flexible roles.

While low-paid workers are often unable to work from home themselves, they are affected by others choosing to work from home. In some sectors, including retail, the nature of low-paid work has changed as a result of the increase home working and remote work during the Coronavirus pandemic. As Kang et al. (2020) notes the demand for delivery services has increased during the pandemic because people were less able or willing to attend stores and hospitality venues in person. As such a long-term shift to higher levels of remote working may change the nature of low-paid work in the retail and hospitality sectors as these industries adjust to a market where people are less mobile/ spend less time in city spaces. Nathan and Overman (2020) and Mortimer et al. (2020) also suggest that retail and hospitality industries will expand/move into suburban areas if remote working becomes a more permanent trend. which may result in the same types of retail or hospitality jobs being available in different areas. This could impact people's job prospects in low-paid sectors if they are unable to travel for work or if travel to these areas proves uneconomical.

Dube et al. (2020) highlight the possibility of further unemployment in the hospitality sector, in addition to that which has already occurred as a direct result of Coronavirus-related guidelines, if people continue to work at home. If unemployment in these sectors continues to grow there is the potential for a significant scarring effect on individuals who have lost their jobs as past unemployment is known to create a long term 'scar' which influences future employment patterns (Arulampalam, et al., 2000). McQuaid (2017) suggests that scarring is a particularly important issue for young people – a group which is likely to be among the worst affected throughout the recovery period.

An international study by Alonso et al. (2020) found that business owners and managers in the hospitality industry were concerned about the possible impact of

continued remote working patterns on levels of patronage in their businesses. One survey respondent said:

**My main concern is how to sustain the business when office workers...are staggering their return to their city office workplaces...**

This concern is echoed in much of the available literature on this topic as most are agreed that a continuation of the current levels of flexible and remote work are likely to have a negative impact on the number of people visiting hospitality venues and city retail spaces on their way to and from their office or during break periods. The interviews conducted for the Alonso et al (2020) study found that many business owners in the hospitality sector were already struggling to meet their business costs given the fall in patronage during the Coronavirus pandemic and many of these were concerned that their businesses could become unsustainable in the long term if current remote working practices were to continue in the medium to long term. Jones and Comfort (2020) also find that Coronavirus and the impacts of remote work have highlighted sustainability as a key issue in the hospitality sector.

## **What are the potential effects of remote working on sectors reliant on urban density, and what are the implications for the labour market and job vacancies?**

A number of sectors are reliant on urban density for their survival – chief among these is city centre retail. Research has found that there is a symbiotic relationship between office workers and urban retail and hospitality sectors as the presence of office workers in urban spaces allow these businesses to remain profitable (Centre for Cities, 2019; Shone, 2020). A 2019 report by Savills found that this relationship can also work the other way as 58% of survey respondents said that leisure and retail facilities were key in making city centre-based work appealing (Savills, 2019). A long-term shift to remote working would disrupt this relationship and could necessitate widespread changes to the functioning of these sectors.

Shone (2020) argues that a long-term increase in remote working would bring about increased localism in the way people shop and engage with hospitality businesses. He highlights the potential lasting impacts of the need to use more local businesses during the Coronavirus pandemic as a key influence on future behaviour as people may fall into more local-based habits. Prior to the pandemic, growing awareness of environmental issues was already resulting in an increased localism in consumption patterns which may be exacerbated by a long-term shift to remote working.

The impact of changing urban density on job vacancies is not yet clear. Job vacancy data demonstrates that the availability of flexible and remote work is far greater for high paid, high skilled roles than for low paid roles. In the context of the Coronavirus pandemic, research by Arthur (2020) on online job adverts shows that vacancies reduced by 60-70% in the first weeks of the first UK lockdown (w/c March 23<sup>rd</sup> 2020). The number of vacancies increased by mid-September 2020 however the number of vacancies remained around 40-50% below pre-pandemic levels. Hensvik et al (2020) found that job seekers responded to this fall in vacancies by searching for jobs less intensively and doing so in sectors which have been less effected by the pandemic. It is possible that such behavioural trends could continue after the pandemic has ended as people become more wary of the potential impact of economic shocks on specific industries and unemployment remains high. Arthur's (2020) research found that the impact of Coronavirus on job vacancies has been felt differently across different sectors. The number of vacancies increased in sectors related to tackling the pandemic such as nursing and care work. However, there were far fewer vacancies than normal in the hard-hit hospitality sector.

The impact on the labour market of a shift to remote work is also not yet clear. A number of studies have highlighted the negative impacts a move to more widespread remote working could have on inequality in the labour market (Kabeer, 2020; Felstead & Reuschke, 2020; Marks, 2020; The Bevan Foundation, 2020). Modelling conducted by Martin and Okolo (2020) on the impact of Coronavirus on the UK labour market suggests that unemployment could increase to as high as 13.25% (4.5 million people) by 2021. This modelling found that non-graduates are more likely to be impacted by changes to the labour market and would see a wage reduction of 2% compared to a 0.9% reduction in the real wage. Martin and Okolo (2020) highlight the importance of training and job creation to help limit the impacts on the labour market in the long-term as, according to their model, only around 15% of non-graduates are able to work remotely. If there was a long-term shift towards remote working as a central practice in the Welsh labour market many of these people would benefit from an increase in training opportunities to enable them to engage in remote work.

## Business support

### How will businesses across different sectors be impacted by an increase in remote working?

Since March 2020, there has been a combination of Welsh Government and UK Government financial support provided to businesses and workers. The UK Government's Coronavirus Job Retention Scheme, more commonly known as



'furlough', allows workers to be financially supported while absent from their job as a result of businesses being closed or because there is no work to do. As of mid-October, over £40 billion had been claimed by 1.2 million employers across the UK. The UK Government has also supplied support to self-employed people, subject to annual trading profits, as well as a series of business interruption and bounce back loans designed to support businesses through the pandemic until previous activities can resume.

The Welsh Government have provided a series of packages that make up their support to businesses. The Economic Resilience Fund has made available nearly £300 million of support to businesses, with different packages provided to micro businesses, SMEs and large businesses. Some funding has also been ringfenced to support tourism and hospitality businesses in recognition of their particular challenges. Additional support was also provided during the firebreak lockdown at the end of October to support businesses forced to close. In addition, it has also provided a fund to support freelancers working in the creative industries, and support for employers who recruit apprentices.

Previous work by the Wales Centre for Public Policy (2020) identified four broad categories of businesses affected by public health restrictions, with each requiring different interventions.

1. Some will require support while they gradually phase their return to something resembling normal activity.
2. Others, including in the hospitality sector, will not be able to resume for some time and therefore employees should be supported to retrain.
3. Those connected to remote tourist areas face particular difficulties as they do not have obvious alternative employment opportunities while restricted travel persists and are likely to face a long period of income loss. They will need enhanced support, such as a job guarantee scheme.
4. Those unable to operate under social distancing requirements, such as some manufacturing businesses, may need to move towards automation. Managing this without substantial job losses will require targeted support.

The Welsh Government policy response to date has responded to these different criteria, with specific packages available for certain sectors alongside the general support provided. As much as is budgetarily possible for the Welsh Government, this should be sustained as long as restrictions are needed to reduce transmission. Wadsworth (2020) highlights that those aged 16-24 are the age group most likely to

have been made redundant or laid off since March 2020. This group may need the most support through economic support and skills training.

Research across the UK by De Lyon et al. (2020) unsurprisingly shows that businesses which have more human contact, such as restaurants, hotels, arts and entertainment, and airlines, have been hardest hit. Those sectors which have been able to manage supply and demand virtually, such as IT and professional services, research, legal and accountancy, have been less hard hit. However, sectors that have managed to withstand the effects of the Coronavirus pandemic are among those likely to be more badly affected by the consequences of leaving the European Union (De Lyon et al., 2020).

Riom and Valero (2020) highlight the huge changes that businesses have gone through across the UK since the pandemic began. They found that over three quarters had changed their products or services, over a third had faced disruptions to their supply chains, and a similar number had faced employee absence due to illness or shielding. Firms that had previously adopted new practices and digital technologies were more likely to do so again during the pandemic. Barriers to innovating for firms included tax incentives, grants and support for skills for those entering the workforce.

## **What might be the long-term impact be to industries losing workers with job-specific skills?**

Relative to the other nations and regions of the UK, the Wales has fewer high productivity sectors, with the economy characterised by public sector employment, lower productivity services, manufacturing, tourism and agriculture, and a high proportion of small firms. While it is broader public health restrictions due to the pandemic that has restricted some of these industries rather than remote working specifically, the impact will be felt in sectors and communities. Reskilling will be an important response to the pandemic, requiring diversification and economic restructuring.

Research into the resilience of economies to the economic shock following the global financial crisis in 2008 highlights the adaptability and innovative capacities of businesses as critical – how well they were able, for example, to shift to different markets, or change their modes of production or ways of working. Similarly, the adaptive capacity of households and individuals was important. Less resilient groups had few buffers in terms of household savings, as well as higher levels of debt, less capacity or willingness to move from where they live, and less capacity to retrain or change jobs (Healy and Bristow, 2018).

Innovation is an ongoing issue for businesses and the Welsh economy. Welsh businesses are characterised by relatively low levels of firm growth and profitability with a preference for favouring stability over growth, which has implications for policy (Heley et al., 2012; Kapitsinis et al., 2019). Despite R&D tax credits being available, uptake of these is low and securing investment in R&D remains a challenge. Increasing awareness of these incentives could encourage companies to take them up. These business-specific factors are potentially more important than looking at different sectors or regions when considering how they may be affected by remote working.

Experts convened to support the Welsh Government's plans for economic and social recovery from the Coronavirus pandemic argued that a key feature of business support will be providing the conditions to facilitate safe economic activity (Wales Centre for Public Policy, 2020). This will include creating safe workspaces, improving digital connectivity and providing safe public transport. The Welsh Government, local authorities and businesses may therefore need strategies to encourage the re-use or refurbishment of empty office or retail space, and to assist businesses to provide safe workplaces. Any strategies should be accompanied by monitoring and evaluation.

The need for the state to support education and skills has been brought sharply into focus by the Coronavirus pandemic. The future of work – especially in low-paid sectors – was already changing and the pandemic has potentially accelerated some of these changes. Offering people sustained adult learning and career progression opportunities once they are in work is crucial. It will be necessary to target support at those in low-wage and low-skilled jobs, the newly unemployed, and new entrants to the labour market, and to combine this with support for those with low or no savings. Alongside this, tailored and intensive support for those furthest from the labour market is needed.

Foundational economy sectors are a key part of the Welsh Government's policy agenda. Some sectors, such as hospitality, will require government support to survive the ongoing loss of business, and could be scarred if there is a long-term rise in unemployment and reduction in discretionary spending. Others, including those linked to the public sector, are likely to be more resilient. Support will need to be targeted at businesses that will be viable subject to short term survival.

There is an ongoing assumption that many businesses will look to cement remote working and the savings that go with it. However, there will be some moderating social factors, such as employee circumstances, legislation issues relating to work conditions, social responsibilities such as childcare, as well as business culture (Willcocks, 2020). Businesses have spent decades building up office spaces, cultures and practices, and a year of remoter working may not instantly destroy that.

How these factors play out as the effects of the pandemic gradually ease next year are unclear, and a cautious approach to policy choices may be sensible.

# Transport

## How might remote working impact transport?

It is still unclear how the Coronavirus pandemic will impact travel behaviours in the long-term. They are likely to be affected by working practices, by changes in shopping behaviours and by perceptions of the safety of public transport. It is difficult to predict the extent to which recent trends will be sustained and if so, for how long. As such, a key priority for Welsh Government should be to monitor these trends as new travel behaviours emerge and existing behaviours change as people return to work in order to inform future transport policy.

As noted in previous sections, modelling suggests that remote working and more flexible working hours could result in people being willing to accept longer commutes if they are able to make fewer trips to the office (Melo & Silva, 2017; de Vos, et al., 2018; Delventhal, et al., 2020). Survey-based research conducted in Chicago during the Coronavirus pandemic found that the shift to remote working in the city was also associated with a move towards modes of transport that reduce contact (Shamshiripour, et al., 2020). However, it is unclear how far such a trend would continue after the pandemic as it remains difficult to predict how peoples' perceptions of the safety of public transport will change. This study also demonstrated, again, the differential accessibility and potential inequality entrenchment of remote working. The survey showed that low-paid workers and those in essential industries continued to use public transport despite concerns about safety because other transport options (e.g. a private vehicle) were too expensive (Shamshiripour, et al., 2020).

## What are the implications for investment in transport infrastructure if high levels of remote working continue in the longer term?

The impacts of high levels of remote working on investment in transport and mobility services remain unclear. Hensher's (2020) work on mobility as a service in Australia highlights that increased remote working presents opportunities to manage key issues in the transport sector including congestion and overcrowding on public services. He also highlights staggered working hours as a key means of improving transport services in future which could encourage more people to use these services and by extension generate a need for long-term investment in transport infrastructure. Finally, Hensher (2020) highlights a potential need for new and

innovative types of investment in transport infrastructure if high levels of remote working continue in order to encourage workers to use public transport.

A short-term increase in remote working without clarity for the long-term implications presents a challenge for decisions about investment in fixed infrastructure. However, if existing assumptions are maintained it also presents an opportunity to embed changes. For example, recent changes could be sustained by investing in areas to support people to switch to public and active transport. Four-fifths (80%) of people in Wales travel to work by car, compared to an average of 68% across Great Britain (Department for Transport, 2019). More flexible working patterns in the future have the potential to cut car usage, but this relies on maintaining good public transport links and promoting its safe use. There is an opportunity to consider what mode of transport use is wanted – car or public – and develop strategies to realise this.

## How might remote working impact non-work journeys, for instance to after-work venues?

A study in Seoul which utilised a censored regression model found that remote workers travelled further for non-work journeys than people who were engaged in traditional office based working patterns (Kim, et al., 2015). This difference also extended to the entire household so that people living in a household where at least one member is working remotely engaged in more non-work travel in terms of distance travelled. However, this was found to be influenced by the number of cars owned by the household. In single vehicle households removing the need to use the vehicle for a daily commute allowed it to be used for non-work journeys by other household members (Kim, et al., 2015). This could therefore suggest that an increase in remote working would help to facilitate the non-work mobility of other household members.

In contrast to Kim et al (2015) findings in Seoul, research by Melo and Silva (2017) in the UK found that there was no intra-household effect of one person in a household choosing to work remotely. However, the focus of the UK study was entirely on commuter travel so it is possible that similar non-work travel impacts as were noted in Seoul may also have occurred in the UK households.

Advice from experts discussing the implications of remote working for cities and urban spaces suggests that policymakers should wait before making significant decisions about transport infrastructure (Lee, et al., 2020). They argue that urban and cultural spaces have historically survived crises, including public health emergencies and events such as 9/11, and societal transformations such as the internet. Each in their own way has threatened domestic and international travel and the idea of concentrated space, yet time and time again people have returned to urban spaces

for their cultural venues and hospitality. While remote working may challenge after-work venues, the change might be one of adaptation more than widespread closure.

## Conclusion

Remote working has temporarily transformed the Welsh economy, and at least some of these changes will persist into the future. Evidence from experts and business surveys suggests that the likely outcome in the future is a blend of office and remote working, to better suit workers' individual needs and ways of working. If promoting remote working is to be an ongoing Welsh Government priority, then greater clarity is needed on what that means in practice. Does it mean encouraging people to work at home or in community spaces, a blend of these, or something else? There may be greater appetite for localised workspaces and hubs, but there is not currently evidence for this, and the need should be established and verified before any significant investment is made.

Initial evidence suggests that remote working has not damaged productivity, and has benefitted some workers who have appreciated the flexibility. Once public health measures are able to be relaxed, allowing employees to work remotely at least some of the time could increase productivity. This should be considered as part of a blended approach that allows people back into offices who would benefit most, such as those in unsuitable housing, or those who benefit more from in-person interaction. Workplaces should also be remembered as a creative and interactive space, which has longer-term implications for innovation and productivity.

Approximately one third of workers in Wales are in low-paid sectors, often the least able to adopt remote working practices, and often in sectors that have been most impacted by the changes. This in turn suggests that certain groups are more vulnerable, including women, disabled people, young people and black, Asian and minority ethnic groups. This reinforces the need long identified by research and evidence: that investment in education, skills and job progression is a long-term route to economic prosperity and resilience.

Welsh cities have been among the slowest to recover footfall following public health restrictions, and a long-term shift towards remote working may relocate city centre retail and hospitality to towns and suburbs. Modelling suggests this would increase real estate prices in those areas and decrease them in cities themselves. However, it is still too early to predict how sustained these changes will be. Urban centres have survived similar crises in the past, and the future trend may be one of adaptation rather than transformation.

Different businesses have been affected by remote working in different ways, with some able to adapt easily, some gradually phasing a return to normal activity, and others reliant on support while they are forced to close. Progress with vaccinations suggests that supporting businesses through to a point where normal activity can resume may still be the best course of action, while regularly surveying businesses, workers and consumers to understand their needs and intentions.

Evidence suggests caution before making any significant changes to transport infrastructure investment. There are still significant inequalities in transport usage, and combined with the uncertainty around future travel behaviours, the focus in the short-term should be on the perceptions of the safety of public and active transport. Over the longer term, investment in fixed and flexible transport infrastructure is needed; but the Government's aspirations for a reduction in private car usage require better integration of planning and transport decisions.

This study will inform other impact assessments and delivery planning for pandemic recovery. One of the key issues where primary data would be helpful is in the area of employer/employee perceptions and intentions. Ongoing academic surveys and privately commissioned studies have been helpful, but further data collected and monitored by government is needed to understand how employers intend to use their workspaces in the future, and workers' attitudes to the trade-offs presented by remote working will help inform long-term policy decisions. For some, the pandemic is likely to be a transformative experience towards remote working, but this will not be the case universally, and rushed decisions could have unintended consequences.

The long-term impact on the labour market remains unclear, but initial studies have highlighted the potential inequalities that could remote working could cause. The Welsh Government's business and skills support packages have so far sought to account for differential impacts and this should continue. It has also focused support directly on skills-based support packages, including increased apprenticeships and training for workers. Evidence suggests this is the appropriate policy action.

While there are some instances in which sector-specific support will be helpful, often a more appropriate policy action is to think about creating the right conditions for businesses, and focusing support on helping businesses to adapt and innovate as required to be resilient. For some businesses, this will be more difficult than others. Those businesses and individuals who are already economically disadvantaged will be less resilient to the changes caused by remote working.

# References

- Adams-Prassl, A., Balgova, M. & Qian, M., (2020). **Flexible Work Arrangements in Low Wage Jobs: Evidence from Job Vacancy Data**, Bonn: IZA Institute of Labour Economics.
- Alonso, A. et al., (2020). **COVID-19, aftermath, impacts, and hospitality firms: An international perspective**. International Journal of Hospitality Management, Volume 91, p. 102654.
- Arthur, R., (2020). **Studying the UK Job Market During the COVID-19 Crisis with Online Job Ads**. Ithaca: Cornell University.
- Arulampalam, W., Gregg, P. & Gregory, M., (2000). **Unemployment Scarring**. The Economic Journal, Volume 111, pp. 577-584.
- Barrios, J. & Hochberg, Y. (2020). **Risk Perception Through the Lens of Politics in the Time of the COVID-19 Pandemic**, Cambridge, Mass.: National Bureau of Economic Research.
- Barry, S. (2020). **Shopping centres in Wales see a further fall in footfall but rate of decline slowing**. Retrieved from: <https://www.business-live.co.uk/retail-consumer/shopping-centres-wales-see-further-18878747>
- Batty, M. (2020). **The Coronavirus crisis: What will the post-pandemic city look like?**. Environment and Planning B: Urban Analytics and City Science, 47(4), pp. 547-552.
- Baudot, L. & Kelly, K., 2020. **A Survey of Perceptions of Remote Work and Work Productivity in the United States during the COVID-19 Shutdown**, Orlando: University of Central Florida.
- BBC News, (2020). Coronavirus: **Stay at home, first minister tells Wales**. Retrieved from: <https://www.bbc.co.uk/news/uk-wales-52012772>
- BBC, 2020. Remote working: How cities might change if we worked from home more. Retrieved from: <https://www.bbc.co.uk/news/uk-52767773>
- Bloom, N, Liang, J and Roberts, J and Ying, Z. J. (2015). **Does working from home work? Evidence from a Chinese experiment**. Quarterly Journal of Economics, 130(1): 165-218
- British Retail Consortium, 2020. Tightening Restrictions Hinders Footfall. Retrieved from: <https://brc.org.uk/news/corporate-affairs/tightening-restrictions-hinders-footfall/>



Centre for Cities (2019). **City Centres: Past, Present and Future**. London: Centre for Cities.

Centre for Cities (2020). High Streets Recovery Tracker. Retrieved from: <https://www.centreforcities.org/data/high-streets-recovery-tracker/>

Chartered Institute of Professional Development (2020). **Working from Home: What's Driving the Rise in Remote Working?** London: Chartered Institute of Personnel and Development

Clark, P., (2020). It is time to say farewell to the scourge of hot-desking. Financial Times, 5th July 2020. Retrieved from: <https://www.ft.com/content/44b0f75e-46e3-4843-bf24-64d18f2cd288> [Accessed: 14<sup>th</sup> December 2020]

Coleman, C., Ricker, D. & J., S., (2020). 10 considerations for transitioning back to work in a postCOVID-19 world. Retrieved from: <https://www.gensler.com/research-insight/blog/10-considerations-for-transitioning-back-to-work-in-a-post>

Couclelis, H. (2020). **There will be no Post-COVID city**. Environment and Planning B: Urban Analytics and City Science, 47(7), pp. 1121-1123.

DeFilippis, E., Impink, S. M., Singell, M., Polzer, J. T., Sadun, R. (2020). **Collaborating during coronavirus: the impact of COVID-19 on the nature of work**. NBER Working Paper No. 27612.

De Lyon, J. and S. Dhingra (2020), **Firm investments in skills and capital in the UK services sector**. OECD Economics Department Working Papers, No. 1632, OECD Publishing, Paris, <https://doi.org/10.1787/c595cf3b-en>

de Vos, D., Meijers, E. & van Ham, M., 2018. **Working from home and the willingness to accept a longer commute**. The Annals of Regional Science, Volume 61, pp. 375-398.

DeFilippis, E. et al., 2020. **Collaborating during Coronavirus: The Impact of Covid-19 on the nature of work**. Cambridge, Mass.: National Bureau of Economic Research.

Delventhal, M., Kwon, E. & Parkhomenko, A., 2020. **How do cities change when we work from home?**, Retrieved from: [https://www.andrii-parkhomenko.net/files/DKP\\_Covid\\_Urban.pdf](https://www.andrii-parkhomenko.net/files/DKP_Covid_Urban.pdf) [Accessed: 14<sup>th</sup> December 2020]

Department for Transport. (2019). **Table TSGB0108: Usual method of travel to work by region of residence**. Statistical data set.

<https://www.gov.uk/government/statistical-datasets/tsgb01-modal-comparisons>

Dingel, J. & Neiman, B., 2020. **How many jobs can be done at home?**, Chicago: Becker Friedman Institute.

Dube, K., Nhamo, G. & Chikodzi, D., 2020. **COVID-19 cripples global restraint and hospitality industry**. *Current issues in tourism* , p. <https://doi.org/10.1080/13683500.2020.1773416>.

Felstead, A., Gallie, D., Green, F. & Henseke, G., 2020. **Getting the Measure of Employee-Driven Innovation and Its Workplace Correlates**. *British Journal of Industrial Relations*, 58(4), 904-935.

Felstead, A. & Reuschke, D., 2020. **Homeworking in the UK: Before and during the 2020 lockdown WISERD Report**, Cardiff: Wales Institute of Social and Economic Research.

Financial Times, 2020. **City of London plans 'back to work' week to revive Square Mile**. [Online] Retrieved from: <https://www.ft.com/content/9507fc2f-ed42-44b0-a6d9-e35285dc70e0> [Accessed 17th December 2020].

Florida, R., Rodriguez-Pose, A. & Storper, M., 2020. **Cities in a Post-COVID World**. *Papers in Evolutionary Economic Geography*, p. 20.41.

Healy, A. and Bristow, G. (2018). **Understanding Community Economic Resilience: Resources, Strategies and Expectations of Communities in the Cardiff Capital Region**. CRE Working Paper, Cardiff University. Retrieved from: [https://www.cardiff.ac.uk/\\_\\_data/assets/pdf\\_file/0011/1095077/Economic-resilience-in-ourcommunities.pdf](https://www.cardiff.ac.uk/__data/assets/pdf_file/0011/1095077/Economic-resilience-in-ourcommunities.pdf)

Heley, J., Gardner, G., & Watkin, S. (2012). **Cultures of local economy in a Celtic fringe region**. *European Urban and Regional Studies*, 19(4), 366– 382. <https://doi.org/10.1177/0969776411431102>

Hensher, D., 2020. **What might Covid-19 mean for mobility as a service (MaaS)?**. *Transport Reviews*, 40(5), pp. 551-556.

Hensvik, L., Le Barbanchon, T. & Rathelot, R., 2020. **Job Search During the COVID-19 Crisis**, Bonn: IZA Institute of Labour Economics.

Holt-White, E. & Montacute, R., 2020. **COVID-19 and Social Mobility Impact Brief #5: Graduate Recruitment and Access to the Workplace**, London: The Sutton Trust.

Hubbard, P., 2020. **How COVID-19 might change the way we live and work for good.** [Online]

Retrieved from: <https://www.kcl.ac.uk/how-covid-19-might-change-the-way-we-live-and-work-for-good>

[Accessed 3rd December 2020].

Jones, P. & Comfort, D., 2020. **The COVID-19 Crisis and Sustainability in the Hospitality Industry.** International Journal of Contemporary Hospitality Management, 32(10), pp. 3037-3050.

Joseph Rowntree Foundation, 2020. **Poverty in Wales 2020**, York: Joseph Rowntree Foundation.

Kabeer, N., 2020. **Labour market inequalities are exacerbated by COVID-19.** [Online]

Retrieved from: <https://blogs.lse.ac.uk/covid19/2020/05/18/naila-kabeer-labour-market-inequalities-are-exacerbated-by-covid-19/>

[Accessed 10th December 2020].

Kang, M. et al., 2020. **COVID-19 impact on city and region: what's next.** International Journal of Urban Sciences, 24(3), pp. 297-315.

Kapitsinis, N., Munday, M. and Roberts, A. (2020). **Business succession in Wales.** Development Bank of Wales

Kim, S., Choo, S. & Mokhtarian, P., 2015. **Home-based telecommuting and intra-household interactions in work and non-work travel: A seemingly unrelated censored regression approach.** Transportation Research Part A, Volume 80, pp. 197-214.

Kretchmer, 2020. **COVID-19: Is this what the office of the future will look like?**, Colgony: World Economic Forum.

Lee, N. et al., 2020. **COVID-19, Inequalities, and the Future of Cities.** London, London School of Economics and Political Science .

Lennox, J., 2020. **More working from home will change the shape and size of cities**, Melbourne: Centre of Policy Studies, Victoria University.

Marks, A., 2020. **Findings from the Working @ Home project**, London: Queen Mary University London.

Martin, C. & Okolo, M., 2020. **Modelling the Differing Impacts of COVID-19 in the UK Labour Market.** Bath: University of Bath.

Maunder, S., 2020. **How is coronavirus affecting house prices?.** [Online] Retrieved from: <https://www.which.co.uk/news/2020/11/how-will-the->

[coronavirus-affect-house-prices/](#)

[Accessed 3rd December 2020].

McCann, P. (2018). **Productivity perspectives**. Productivity Insights Network.

Melo, P. & Silva, J., 2017. **Home telework and household commuting patterns in Great Britain**. Transportation Research Part A, Volume 103, pp. 1-24.

Moeckel, R., 2017. **Working from Home: Modelling the Impact of Telework on Transportation and Land Use**. Transportation Research Procedia, Volume 26, pp. 207-214.

Mortimer, G., Grimmer, L. & Maginn, P., 2020. **The suburbs are the future of post-COVID retail**. The Conversation, 2nd November, p. Online.

Nathan, M. & Overman, H., 2020. **Will coronavirus cause a big city exodus?**. EPB: Urban Analytics and City Science, 47(9), pp. 1537-1542.

Nilles, J., 1991. **Telecommuting and urban sprawl: mitigator or inciter?**. Transportation, 18(4), pp. 411-432.

Nilles, J., 1996. **What does telework really do to us?**. World Transport Policy and Practice, 2(1), pp. 15-23.

Office for National Statistics, 2020. **Coronavirus and the latest indicators for the UK economy and society: 3 December 2020**. [Online]

Retrieved from:

<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/coronavirustheukeconomyandsocietyfasterindicators/latest#footfall>

[Accessed 4th December 2020].

Parady, G., Taniguchi, A. & Takami, K., 2020. **Travel behaviour changes during the COVID-19 pandemic in Japan: Analysing the effects of risk perception and social influence on going-out self-restriction**. Transportation Research Interdisciplinary Perspectives, Volume 7, p. 100181.

Parker, L., 2020. **The COVID-19 office in transition: cost, efficiency and the social responsibility business case**. Accounting, Auditing and Accountability Journal, 33(8), pp. 1943-1967.

Relihan, L., Ward, M. & Wheat, C. e. a., 2020. **The Early Impact of COVID-19 on Local Commerce: Changes in Spend Across Neighborhoods and Online**. CEP Occasional Paper 50, London: Centre for Economic Performance.

Resolution Foundation, 2020. **From Locking-Down to Levelling-Up**, London: Resolution Foundation.

Reuschke, D. & Felstead, A., 2020. **Changing workplace geographies in the COVID-19 crisis**. *Dialogues in Human Geography*, 10(2), pp. 208-212.

Rhee, H.-J., 2009. **Telecommuting and urban sprawl**. *Transportation Research Part D: Transport and Environment*, 14(7), pp. 453-460.

Riom, C. & Valero, A., 2020. **CEP Covid-19 analysis: The business response to Covid-19: the CEP-CBI survey on technology adoption**.

Retrieved from:

[https://cep.lse.ac.uk/\\_NEW/PUBLICATIONS/abstract.asp?index=7291](https://cep.lse.ac.uk/_NEW/PUBLICATIONS/abstract.asp?index=7291)

[Accessed 14th December 2020].

Rodrigues, J. & Ifans, G., 2020. **Covid-19 and the Welsh economy: working from home**. *Wales Fiscal Analysis*, Cardiff.

Rubin, O, Nikolaeva, A, Nello-Deakin, S and te Brömmelstroet, M. (2020). **What can we learn from the Covid-19 pandemic about how people experience working from home and commuting?** Centre for Urban Studies, University of Amsterdam Working Paper.

Saba, T, Cachat-Rosset, G, Marsan, J, Klarsfeld, A and Carillo, K (2020). **COVID-19 Crisis Triggers Teleworking: A Global Cure or a Short-term Solution**. Montréal: Université de Montréal

Samani, S. & Alavi, S., 2020. **Are open plan office designs still popular after coronavirus pandemic?**. *Performance Improvement*, 59(8), pp. 24-32.

Savills, 2019. **What Workers Want: Europe 2019**, London: Savills.

Senedd Research, 2020. **Coronavirus: Poverty**. [Online]

Retrieved from: <https://senedresearch.blog/2020/05/07/Coronavirus-poverty/>

[Accessed 27 October 2020].

Shamshiripour, A., Rahimi, E., Shabanpour, R. & Mohammadian, A., 2020. **How is COVID-19 reshaping activity-travel behaviour? Evidence from a comprehensive survey in Chicago**. *Transportation Research Interdisciplinary Perspectives*, Volume 7, p. 100216.

Shone, G., 2020. **Shifting working patterns: How WFH could be the high street's saviour**. [Online]

Retrieved from: <https://www.eji.co.uk/news/shifting-working-patterns-how-wfh-could-be-the-high-streets-saviour/>

[Accessed 10th December 2020].

Stromquist, B., 2020. **Taking care of each other in the post-pandemic open office.** [Online]

Retrieved from: <https://www.gensler.com/research-insight/blog/community-in-the-post-pandemic-open-office>  
[Accessed 8th December 2020].

The Bevan Foundation, 2020. **Reducing the impact of Coronavirus on Poverty in Wales**, Merthyr Tydfil: The Bevan Foundation.

Understanding Society, 2020. **Understanding Society: Covid-19.** [Online]  
Retrieved from: <https://www.understandingsociety.ac.uk/topic/covid-19>  
[Accessed 12th December 2020].

Valet, V. (2020). **Working from home during the coronavirus pandemic.** Forbes.  
Retrieved from: <https://www.forbes.com/sites/vickyvalet/2020/03/12/working-from-home-during-the-coronavirus-pandemic-what-you-need-to-know/>

Verdú, F. M., and Tierno, N. R. (2019). **Clustering and innovation: firm-level strategizing and policy.** Entrepreneurship and Regional Development 31(1-2).  
Retrieved <https://doi.org/10.1080/08985626.2018.1537143>

Vilhelmson, B. & Thulin, E., 2016. **Who and where are the flexible workers? Exploring the current diffusion of telework in Sweden.** New Technology, Work and Employment, 31(1), pp. 77-96.

Wadsworth, J., 2020. **Blog: Who's being made redundant during COVID? Who is staying at work. And is it any different from usual?.** [Online]  
Retrieved from:  
[https://cep.lse.ac.uk/\\_NEW/PUBLICATIONS/abstract.asp?index=7552](https://cep.lse.ac.uk/_NEW/PUBLICATIONS/abstract.asp?index=7552)  
[Accessed 14th December 2020].

Wales Centre for Public Policy, 2020. **Building back better? Priorities for Reconstruction after the Coronavirus Pandemic.** [Online]  
Retrieved from: <https://www.wcpp.org.uk/publication/building-back-better-priorities-for-reconstruction-after-the-coronavirus-pandemic/>  
[Accessed 14th December 2020].

Wales Centre for Public Policy, 2020. **Planning for a Prosperous, Equal and Green Recovery from the Coronavirus pandemic**, Cardiff: Wales Centre for Public Policy.

Webb, J., Parken, A., Hodges, H. & Mathias, M., 2018. **Promoting job progression in low pay sectors**, Cardiff: Wales Centre for Public Policy.

Welsh Government (2020). **Aim for 30% of the Welsh workforce to work remotely.** Retrieved from: <https://gov.wales/aim-30-welsh-workforce-work-remotely> [Accessed 7 January 2021].

Willcocks, L., 2020. **Remote working: here to stay?**. [Online]  
Retrieved from: <https://blogs.lse.ac.uk/management/2020/04/03/remote-working-here-to-stay/>  
[Accessed 14th December 2020].

World Economic Forum (2020). **Pandemic, productivity and innovation**. Retrieved from: <https://www.weforum.org/agenda/2020/11/pandemic-productivity-innovation-remote-working/>

## Acknowledgements

The authors would like to thank Professor Alan Felstead for his comments on this work. The authors are solely responsible for any errors or omissions.

## Author Details

**Isabelle Carter** is a Research Assistant at the Wales Centre for Public Policy.

**Dr Craig Johnson** is a Research Associate at the Wales Centre for Public Policy.

For further information please contact:

**Dr Craig Johnson**

Wales Centre for Public Policy

+44 (0) 29 2087 5345

[info@wcpp.org.uk](mailto:info@wcpp.org.uk)

**OGL** This report is licensed under the terms of the Open Government License