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Will the VLE strategy reduce the barriers to employment for the economically inactive living in the poorest parts of the Valleys?

Will the VLE strategy reduce the barriers to employment for the economically inactive living in the poorest parts of the Valleys?

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Views expressed in this report are those of the researcher and not necessarily those of the Welsh Government

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Glossary of acronyms

DfT: Department for Transport

LO:

LSOA: Lower Super Output Area

SOC: Standard Occupational Categories

UKCES: UK Commission for Employment and Skills

VLE: Valley Line Electrification

WG: Welsh Government

Executive Summary

1. The Valley Line Electrification (VLE) strategy is thought to offer four economic benefits. One such benefit hopes that the VLE will reduce the barriers to employment experienced by the economically inactive living in the Valleys. The Local Government and Communities' transport team has commissioned this study to explore this claim.

2. Method: This study is structured according to four assumptions: (i) That the economically inactive are prepared to use this service (ii) That a faster network will improve the commuting radius of those willing to commute. (iii) That any such improvements will be affordable. (iv) That these improvements will improve access to jobs. These assumptions have been explored and tested by considering each in turn and how they relate to two towns in the Valleys: Merthyr Vale and Brithdir. To do this, the study draws on secondary data from social surveys, statistics and railway timetables/pricing in addition to wider academic literature and commissioned reports.

3. Findings: Social surveys suggest that many of the economically inactive living in the Valleys are prepared to commute to work. However, the increased speeds offered by the VLE strategy will only widen the commuting radii for those willing to travel over 11 minutes. The study found that an additional stop is added to the radius of those willing to travel 11- 20 and 21-30 minutes. These additional stops relate to areas of high unemployment. This suggests improved access to jobs.

   However, this study found that any such benefits were mostly negated by the costs of travel. From the two towns, potential commuters are unlikely to spend over 5% of their salary on commuting. On this basis, such commuters could only afford to travel 1 stop in either direction if travelling on day fare and 8-10 stops if travelling on a 7 day season ticket. For those travelling on day fare in particular the costs of accessing areas of high

employment were significantly greater than expected costs of commuting as a percentage of salary.

4. Policy recommendations: This report recommends that future policy should focus on improving the affordability of the VLE service to help the economically inactive benefit from the strategy. This may be achieved by a combination of:
    - reduced or subsidised fare for target groups,
    - increasing the willingness and ability of such groups to purchase season tickets,
    - increasing the willingness of such groups to spend the greatest affordable percentage of their salary on commuting costs.

1 Introduction

Delors' image of a Trans-European-Network of modern infrastructure has been gaining in support across the member states. The UK has begun a programme intended to upgrade the existing rail system to accommodate electric rather than diesel powered trains (DfT, 2009). One of the latest agreed projects will see a high-speed link between Cardiff and London (DfT, 2011). Building on this development the Welsh Government is looking at the potential benefits of extending these improvements across the wider city region.

This Valley Lines Electrification (VLE) proposal is being considered as a key feature in a developing city regional approach for South East Wales (Barry, 2011a). This proposal is believed to offer four economic benefits:

- Reduced barriers to employment in South East Wales generally and the Valleys in particular.
- A way to enable South East Wales to function as a cohesive economic area.
- A way to attract and maintain high value business.
- A support to the regeneration projects in the Heads of the Valleys.

This study will focus on the first of these objectives by looking at four of the assumptions underpinning this objective.

(i) Demand: the economically inactive living in the Valleys could be persuaded to recognise the potential benefits of an improved rail system and would be willing to use this system to commute to a place of work.

(ii) Faster travel: the increased speeds of the VLE will allow the economically inactive from the Valleys to access wider radii from which they can seek and maintain employment.

(iii) Costs: the costs of using the VLE will not unduly restrict these commutable radii.

(iv) Job opportunities: there are likely to be suitable job opportunities within these commutable radii.

These lines of enquiry will be used to structure this report into four chapters from which I will draw policy recommendations and considerations for further research.

2 Demand

The economically inactive living in the Valleys recognise the potential benefits of an improved rail system and are willing to use this system to commute to a place of work.

A survey undertaken by Blackaby et al found that, of those classified as economically inactive and living in the Valleys, 46% said that they were seeking or wanted work (Blackaby et al, 2004: 29). However, when asked about the prospects of obtaining such work, nearly half did not believe that they would find the kind of job they wanted in proximity to their home (Blackaby et al, 2004: 82).

This combination of willingness to work and the perception of low opportunity may begin to account for the relatively high proportions of those willing to commute. Figure 1 below shows that over half the economically inactive living in the Valleys and willing to work were prepared to travel for over 21 minutes to their jobs. Interestingly, approximately 24% of those willing to work were prepared to travel more than 31 minutes. There is a good case it seems, to assume that the unemployed from the Valleys are willing to commute to a place of employment. (Figure 1 derived from Blackaby et al, 2004: 77).

Figure 1: Table showing the percentages of those willing to commute for different periods of time

	Valleys
10 mins or less	14
11-20 mins	29
21-30 mins	31
31 mins or more	24
Not answered	3

Source: extracted from Blackaby et al, 2004: 77

Blackaby et al.'s survey begins to suggest a demand for an improved transportation link from the Valleys to help the economically inactive access

work. This demand seems all the more likely given that 64% of respondents believed that the lack of job opportunities were owing to difficulties with existing transport (Blackaby et al, 2004: 107).

So how will an improved VLE network respond to this demand?

Unfortunately, Blackaby et al's survey did not explore 'transport difficulties' in any greater detail. However, a recent survey by Passengerfocus begins to offer some insight into likely factors affecting the Arriva Wales service. They found that the most significant influences on customer satisfaction were: the cost of the train fare, cleanliness / appearance, sufficient passenger and luggage capacity and punctuality (Passengerfocus, 2011: 6-7).

Whilst a shift from diesel to electric trains is considered to improve operating costs and reduced emissions (DfT, 2009), it is unlikely that this will result in reduced train fare. In terms of aesthetics and passenger capacity, it does not seem unreasonable to assume that new diesel stock could accommodate this requirement as easily as new electrically powered trains. For the passenger, probably the most distinguishable advantages of the VLE proposal over a much simpler replacement strategy are the 15% target reduction in journey times and improved reliability across the network.

It is difficult to measure the impact that a more reliable service will have on the economically inactive willing to commute to work from the Valleys. However we can consider what advantages a 15% reduced journey time would have on this group's commutable radii. This will be the focus of chapter three.

3 Faster Travel

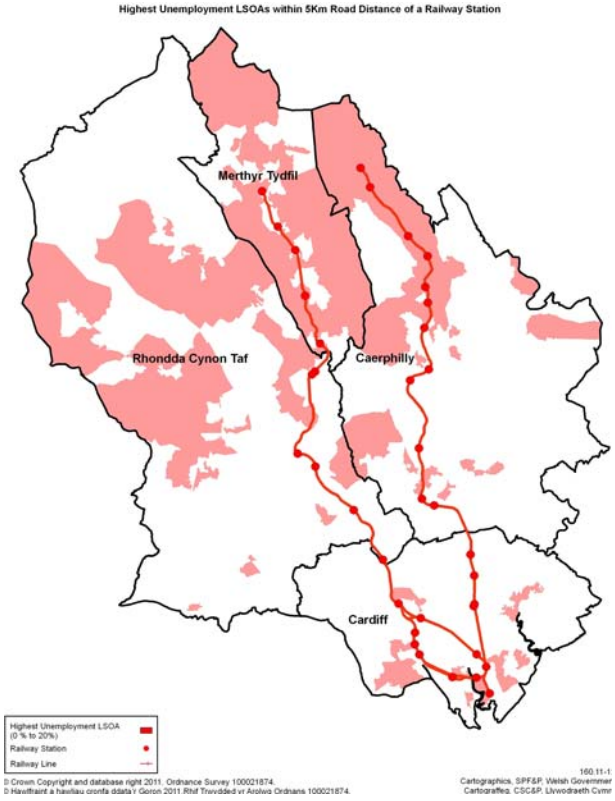
The increased speeds of the VLE will allow the economically inactive from the Valleys to access much wider radii from which they can seek and maintain employment.

Selecting case studies

It is beyond the scope of this study to define commuting radii for each train stop in the Valleys. In order to assess the likely impact of the improved service discussed in chapters three, four and five I have selected two stops on the Valley railway network: Merthyr Vale and Brithdir.

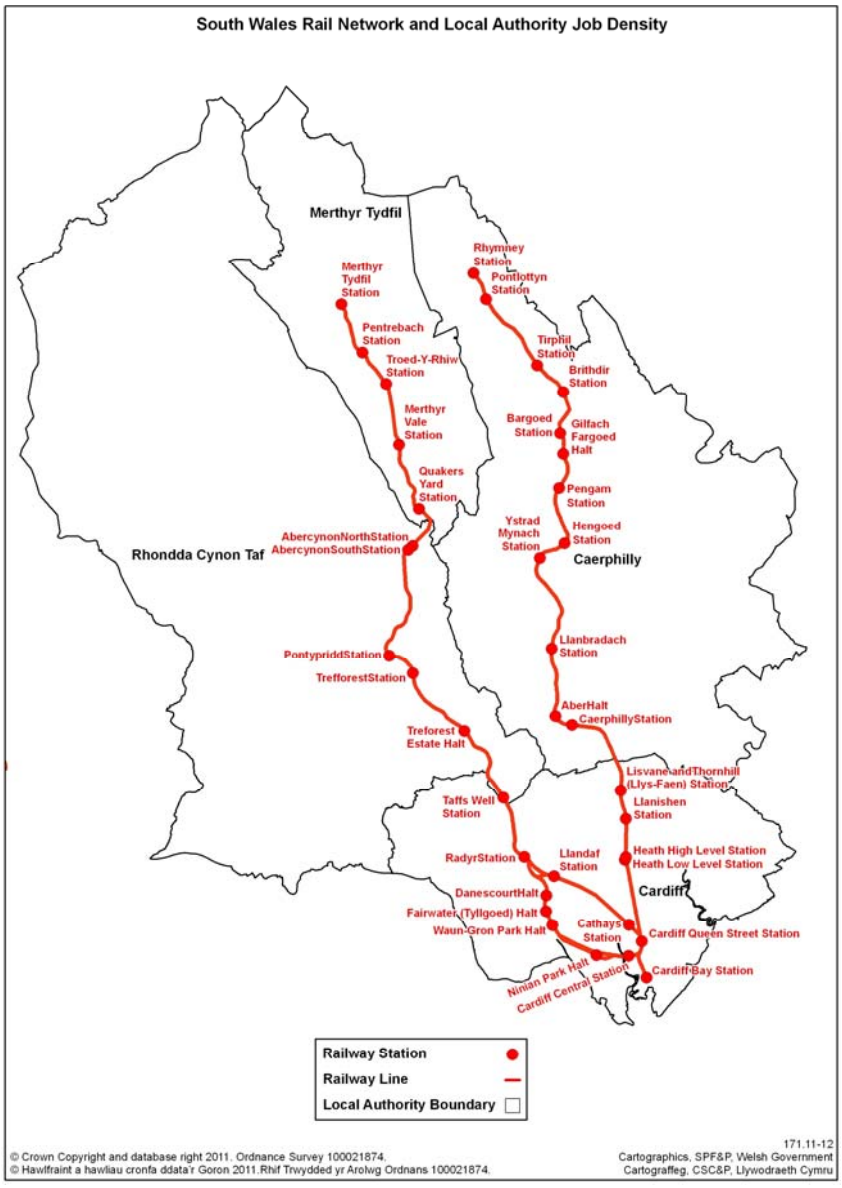
Looking at the map relating unemployment to two of the Valley's railway lines (Figure 2) we see that, in general, towns situated further from the city centre suffer with higher levels of unemployment. Merthyr Vale and Brithdir both have very high levels of unemployment and are positioned on two different railway lines 11 and 12 stops from Cardiff's Central station (fig 3). As such, they may be considered as two cases where a successful transport strategy could best improve levels of employment and community wellbeing. Further studies will be required to consider other indicators especially those drawing on local knowledge.

Figure 2: Map showing the valleys rail network overlaid with areas of unemployment



Source: StatsWales WIMD data 2011; WG cartographics

Figure 3: Map showing the stops on two Valleys rail lines: Cardiff Central–Merthyr Tydfil and Cardiff Central-Rhymney

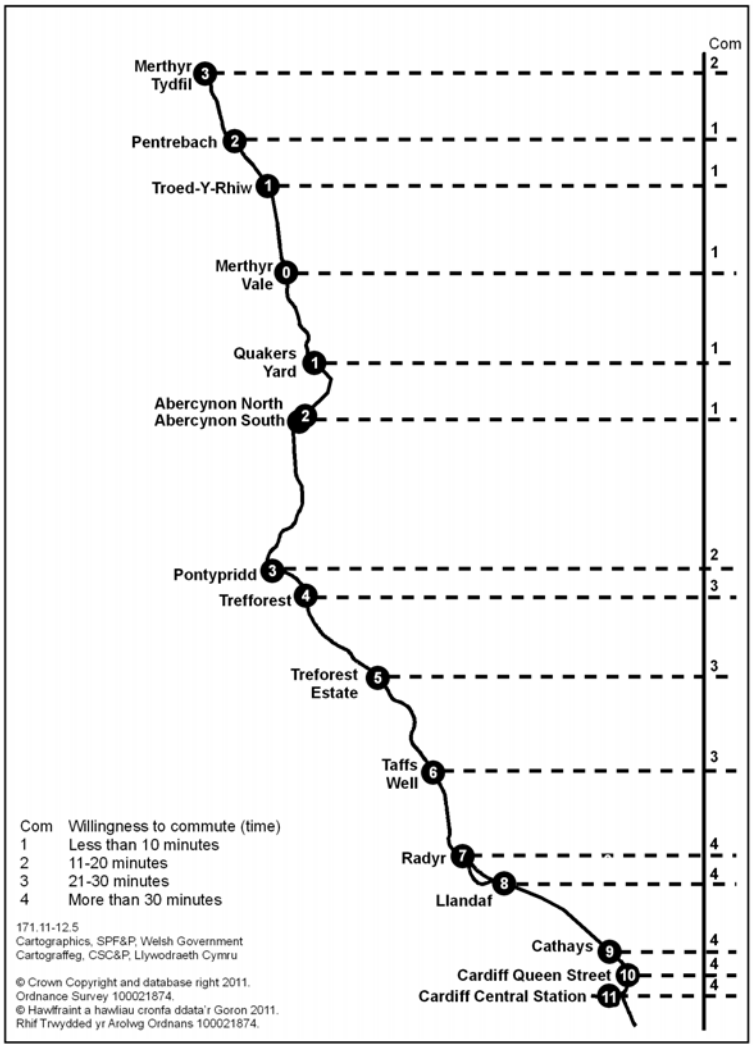


Source: WG cartographics

Existing commuting times

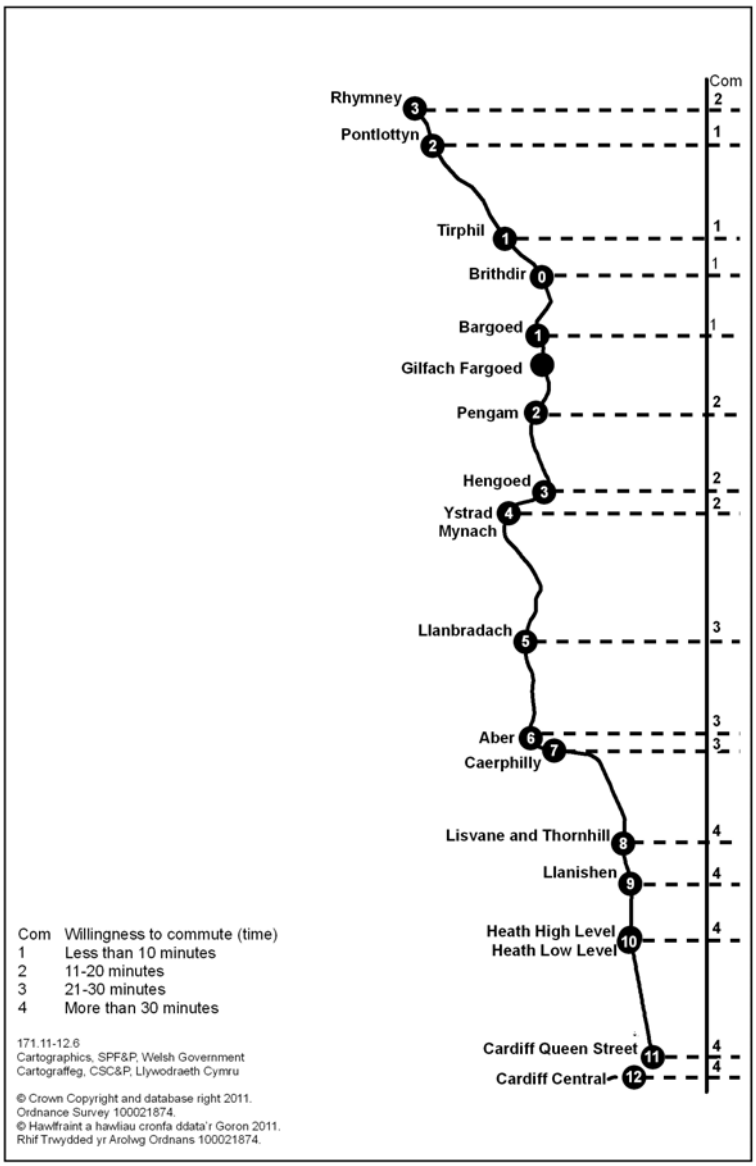
Figures 4 and 5 overlay the amount of time currently required to commute from these two stops according to four categories: less than 10 minutes commute, 11-20 minutes commute, 21-30 minutes commute and over 31 minutes commute. These categories correspond to Blackaby et al's willingness to commute data (see Figure 1).

Figure 4: Time taken to commute from Merthyr Vale using the diesel powered network



Source: Blackaby et al, 2004: 77; National rail website; WG cartographics

Figure 5: Time taken to commute from Brithdir using the existing diesel powered network



Source: Blackaby et al, 2004: 77; National rail website; WG cartographics

More than 30 minutes

Both maps show that commuting more than 30 minutes adds the greatest number of stops to the commutable radius. Commuting over 30 minutes from Merthyr Vale and Brithdir extends the commuting radius by five stops, whereas other commuting bands extend the radius by only 2 to 4 stops.

Less than 10 minutes and 11-20 minutes

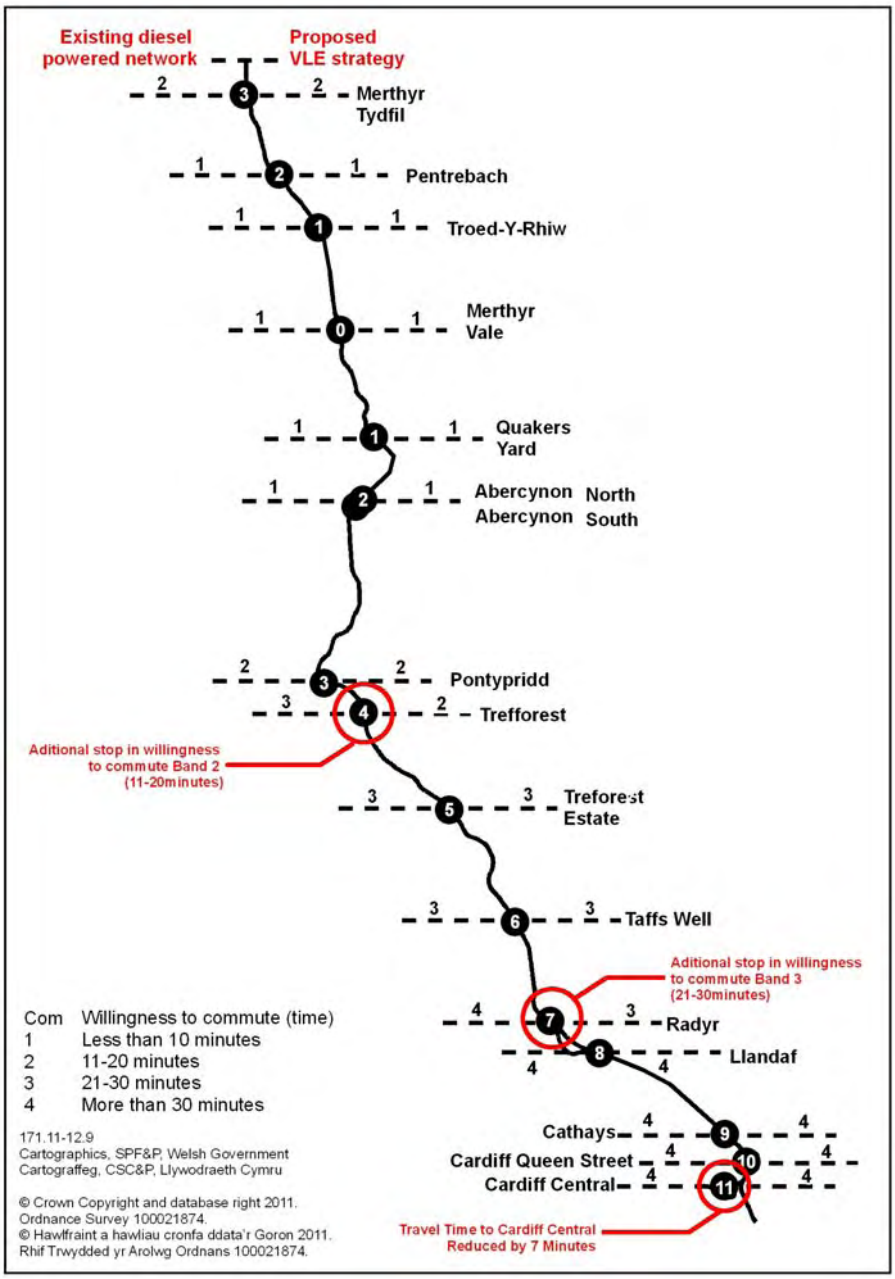
After the upper band of commuting times, the most significant extension of the commuting radius can be seen in the lower willingness to commute bands (less than 10 mins and 11-20 mins). However, the importance of these bands differs between the two maps. From Merthyr Vale, potential commuters can access 4 stops within the first 10 minutes whereas travelling as much as 20 minutes extends the radius by only 2 stops. From Brithdir, potential commuters can access 3 stops within the first 10 minutes whereas travelling as much as 20 minutes adds 4 further stops. This suggests that the respondents who are the least willing to commute from Merthyr Vale benefit far less in adding an additional 10 minutes to their journey time compared to the equivalent group living in Brithdir.

Taken together this data suggests that the greatest extension of the commutable radius occurs over short periods of time (less than 10 minutes from Merthyr Vale and 11-20 minutes from Brithdir) or for much longer periods of time (over 30 minutes). Of these, the latter provides the greatest extension to commuting radius. Looking at Blackaby et al's data this would benefit up to 24% of those living in the Valleys and wanting to work.

Comparing existing and proposed travel

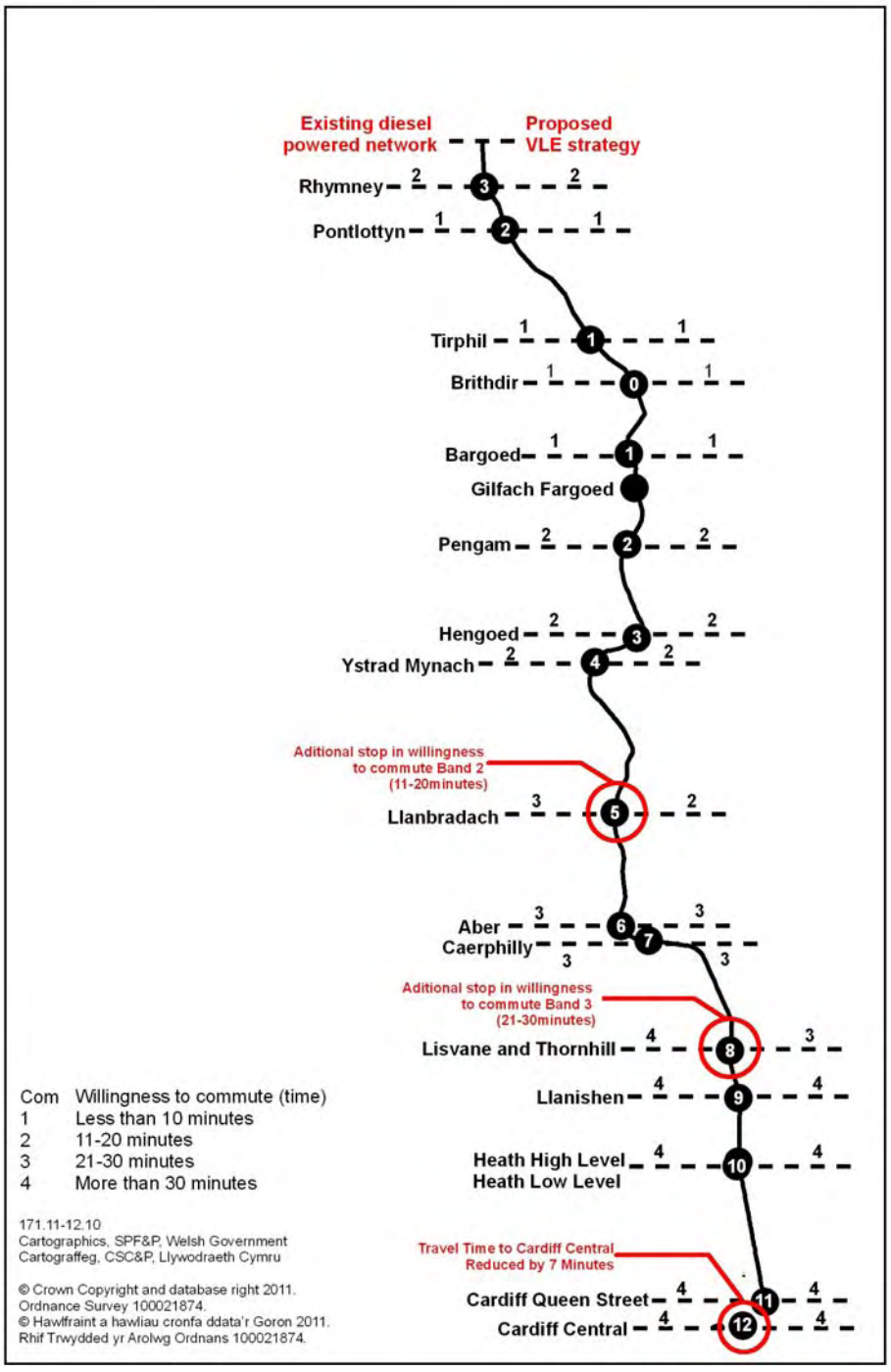
Assuming the VLE strategy will improve these journey times by 15% consistently, figs 6 and 7 plot the proposed times against the existing times.

Figure 6: Commuting radii from Merthyr Vale using the existing diesel network and the proposed VLE strategy



Source: Blackaby et al, 2004: 77; National rail website; WG cartographics

Figure 7: Commuting radii from Brithdir using the existing diesel network and the proposed VLE strategy



Source: Blackaby et al, 2004: 77; National rail website; WG cartographics

In general, the VLE proposal provides greater balance across the willingness to commute bands. All bands now range between 3 and 5 additional stops rather than 2 and 5 additional stops.

Less than 10 minutes

Looking specifically within the first commuting band (less than 10 minutes), commuters from Merthyr Vale and Brithdir are not able to access any more stops on the Valley line using the VLE proposal. Whilst there are improvements in travel time these are limited to less than 1.5 minutes[1].

11- 20 minutes

On both lines the greatest impact can be seen in the second commuting band, 11-20 minutes. In both cases the commutable radius is extended by one stop (as highlighted on figs 6 and 7). From Merthyr Vale this increases the number of stops from 2 to 3 and from Brithdir this increases the number of stops from 4 to 5.

21-30 minutes

This improvement is carried across the third willingness to commute band, 21-30 minutes (as highlighted on figs 6 and 7). As a result, the number of stops within the willing to commute band, over 31 minutes, has been reduced from 5 to 4 in both cases. Indeed, using the improved VLE, those travelling from Brithdir benefit from the largest extension to commuting radius by travelling for 11-20 minutes.

Over 31 minutes

Because there is no upper limit to the fourth commuting band (over 30 minutes) there are no obvious benefits except for the 7.2 minute improvement on the commute time to Cardiff Central from Merthyr Vale and Brithdir[2]. However, if we had defined this band according to a ten minute interval (ie 31-40 minutes) then the commuting radius would have been extended by one stop also.

[1] See appendix, tables 2 and 3 for a more detailed breakdown
[2] See appendix, tables 2 and 3 for a more detailed breakdown

Conclusions

Looking across these observations it seems that, whilst the VLE offers greater balance across the willingness to commute bands, this re-balancing will only impact on those willing to commute over 11 minutes. Returning to Blackaby et al's survey, this accounts for 84% of the economically inactive who are willing to commute to work from the Valleys.

This potential workforce may benefit from the VLE in two ways:

- An extended commuting radius for those willing to travel for over 11 minutes and particularly for those willing to commute between 11-20 minutes.
- An overall improvement of travel time to Cardiff city centre.

Looking at commuting time alone, chapter three of this report suggests that the VLE proposal may offer some potential benefits to help connect the economically inactive to more sites of employment.

4 Cost

The costs of using the VLE will not unduly restrict these commutable radii.

Whilst 84% of those willing to commute more than 11 minutes may, in theory, benefit from improved train times, these benefits will only be felt if they are affordable to this potential workforce. Blackaby et al observed that travelling costs were particularly prohibitive for the economically inactive (Blackaby et al, 2004: 105). With this in mind, this fourth chapter considers the costs of using this improved service and what limitations this places on commuting radii.

To appreciate how such costs may impact upon this potential workforce, we must consider the price of travel fare against their expected earnings. Whilst the former can be derived from standard train rates, the latter will be calculated drawing on two factors:

- Expected work patterns

and

- Reserved salary levels

Work patterns

Blackaby et al's survey found that 50% of the economically inactive living in the Valleys wanted to work on a full-time basis and 35% wanted to work on a part-time basis (16-30 hours). The equivalent figures for those living in 'urban hotspots' represented 38% for full-time work and 45% for part-time work (Blackaby et al, 2004: 43). This suggests that those living in the Valleys are more likely to seek jobs that allow them to work full-time or close to full-time.

Blackaby et al also found that 39% of respondents from the Valleys were not prepared to work 'irregular' work patterns in comparison to 23% of respondents living in urban hotspots (Blackaby et al, 2004: 45).

Taken together, these two findings suggest that the economically inactive living in the Valleys show a strong preference for working regular, full-time work patterns. Though Blackaby et al do not define what constitutes a 'regular' work pattern; it is fair to assume that this refers to an 8 hour day worked for each or most days between Monday and Friday.

Further research will need to be undertaken to decide whether these preferences correspond to demand. However, there are two reasons why this preference will be used as the basis for this study.

Firstly, it is unlikely that the economically inactive will actively seek and maintain employment in positions that fall significantly short of their expectations or reservations. This is especially the case if these jobs require long commutes.

Secondly, this preference for 'regular' work patterns is better suited to a train-based commute. The best value for money from any commuting cost is achieved by regularly working the maximum number of hours per day with the least number of commutes between home and the workplace. The respondents' strong preference for regular working hours is likely to offer the best value for money and, therefore, increase the affordable distance of travel. Blackaby et al's findings suggest, therefore, that expected work patterns are most suitable to commuting by train.

Salary expectations

According to Blackaby et al's survey, 64% of respondents from the Valleys defined their hourly reservation wage between £3.01 and £6.00. Over half of these (37%) defined their hourly reservation wage in the two categories to either side of the national minimum wage[3]. Given the relatively low skill levels

[3] It should be noted that the survey was conducted in 2004 when the national minimum wage for adults was £4.50

in this group, Blackaby et al conclude that the wage aspirations for respondents were 'broadly realistic' (Blackaby et al, 2004: 69).

Looking at the work patterns and salary expectations from Blackaby et al's survey it seems reasonable to assume that a large portion of the economically inactive from the Valleys expect to work 8 hours a day, five days a week for current national minimum wage rates.

Travel fare

Those working five days a week in a fixed location of employment may benefit from a season ticket. National rail offer several time periods for such tickets: 7 days, 1 month, 3 months, 6 months and 12 months. It is unlikely that those starting work after a period of unemployment will be able to afford all but the first of these options: a 7 day season ticket. This also corresponds with the minimum statutory notice period to be provided by an employer.

For the purpose of this study, these work characteristics will be used to assess the commuting radii according to the percentage of salary required to make such journeys. To allow for different rates of travel fare, this study will focus on two scenarios: day fare and a 7 day season ticket.

This analysis is based on the following assumptions:

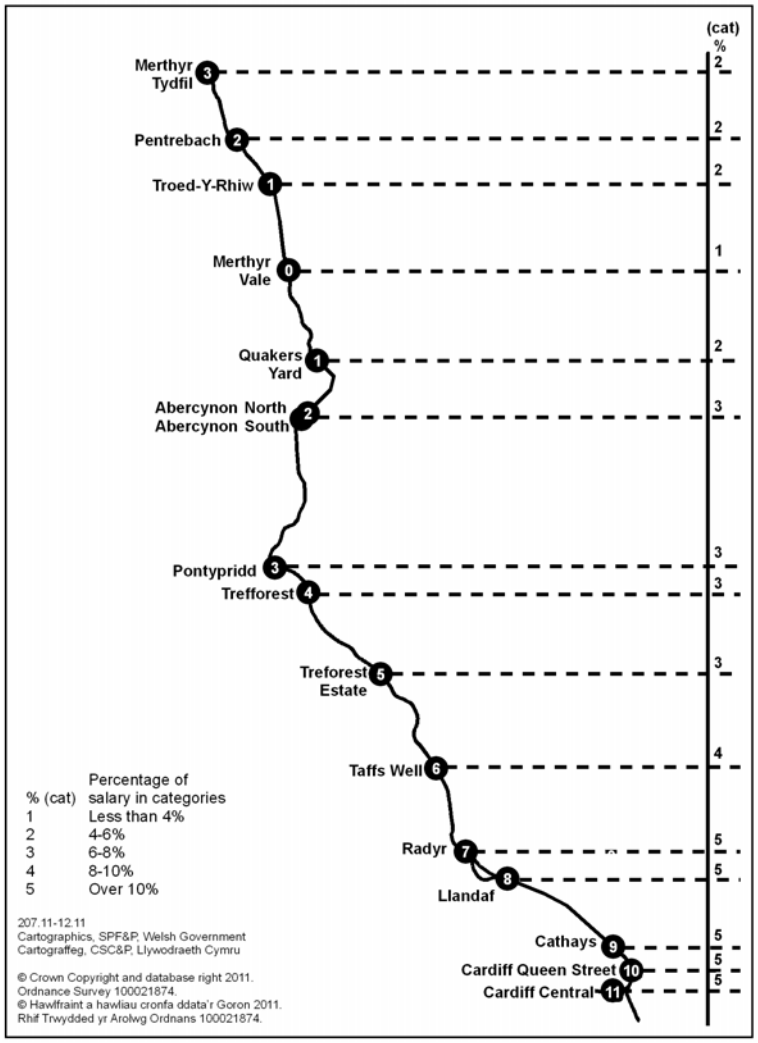
- The potential workforce would be willing and most likely to work 8 hours per day and receive a salary of £48.64 per day based on the NMW for adults aged 21 years and over[4].
- Train fare is charged at:
    i. A standard day return calculated at the time of analysis (December, 2011).
    ii. A 7 day season ticket calculated at the time of analysis (December, 2011).

[4] This age band of 21 years and over was selected as it represented approx 90% (weighted) of the respondents surveyed.

- Train fare remains the same before and after electrification.

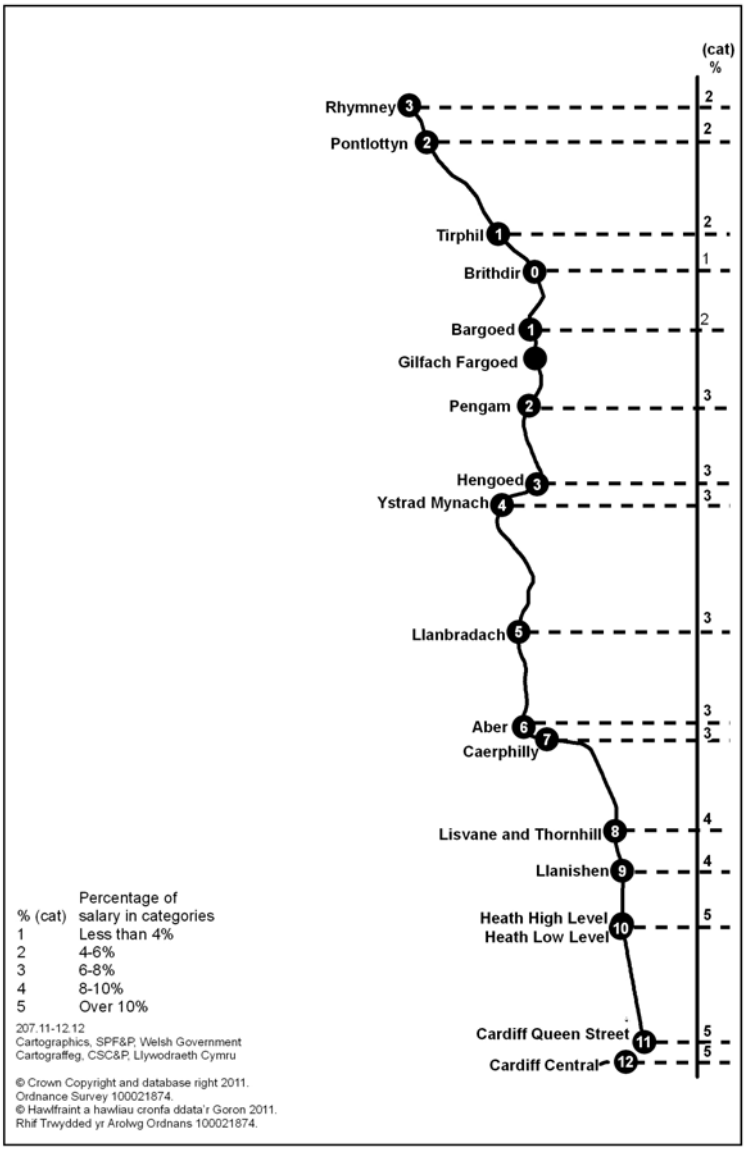
Figures 8 and 9 show the percentage of salary required to commute from Merthyr Vale and Brithdir. These percentages are defined according to five categories: less than 4%, 4-6%, 6-8%, 8-10% and over 10%.

Figure 8: Percentage of salary required to commute from Merthyr Vale (Day fare)



Source: National rail website; WG cartographics

Figure 9: Percentage of salary required to commute from Brithdir (Day fare)



Source: National rail website; WG cartographics

Looking at the two maps we see that commuters cannot access any stops without spending over 4% of salary. Beyond this figure we see that only two further stops are accessible to those willing to spend 4.1% of their salary on commuting[5].

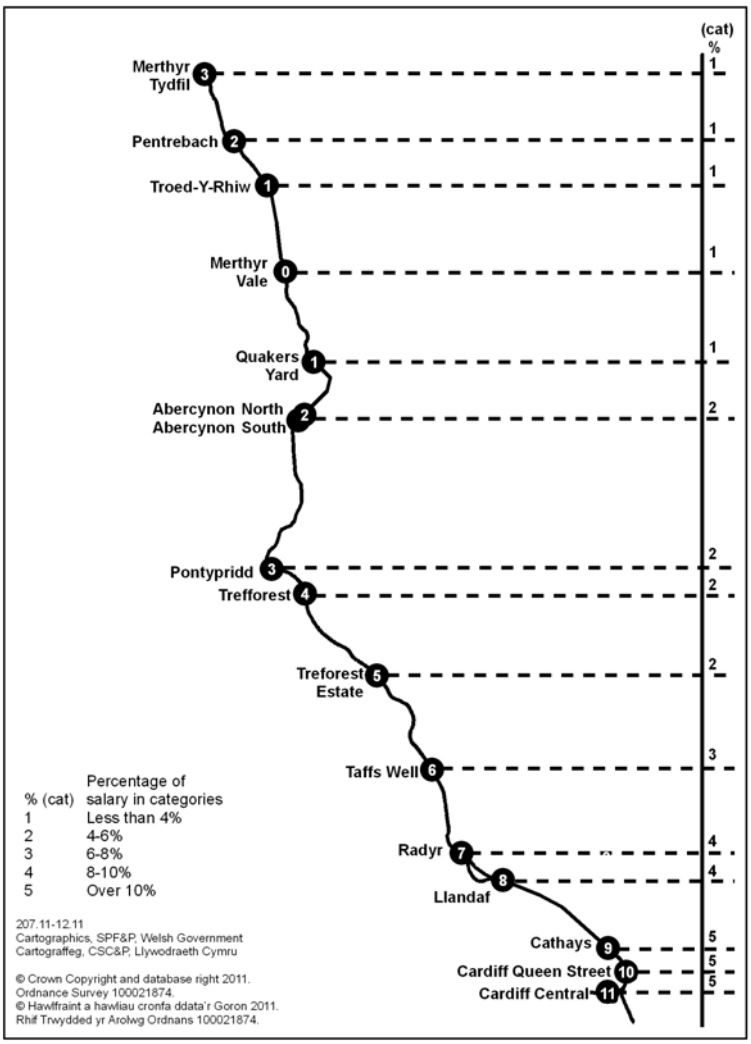
Interestingly, there is a significant increase in the number of stops available to commuters willing to spend 6-8% of their salary. From Merthyr Vale, commuters are able to extend their commuting radius by 4 stops and 6 stops

[5] See appendix, tables 5 and 6 for more detailed information

from Brithdir. As a whole, this provides access to 9 out of the 15 stops and 11 out of the 16 stops respectively.

Whilst there are few benefits in an increase of expenditure from 8-10 percent of salary (an extended radius of 1-2 stops) we see another significant increase for those willing to spend over 10% of their salary on commuting. From Merthyr Vale, commuters are able to extend their commuting radius by 5 stops and 3 stops from Brithdir if they spend up to 14% of their salary on commuting costs[6].

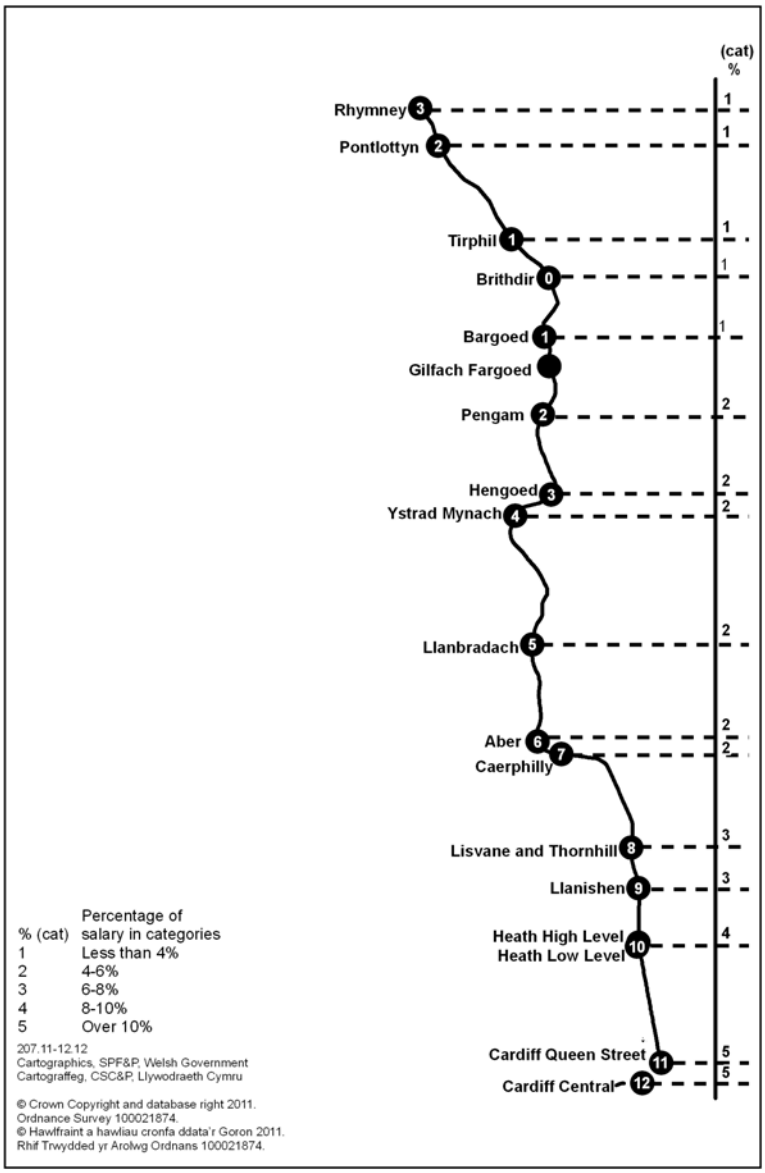
Figure 10: Percentage of salary required to commute from Merthyr Vale (7 day season ticket)



Source: National rail website; WG cartographics

[6] See appendix, tables 5 and 6 for more detailed information

Figure 11: Percentage of salary required to commute from Brithdir (7 day season ticket)



Source: National rail website; WG cartographics

The two maps above show the improvements gained by commuters who are willing or able to purchase a 7 day season ticket. Spending up to 4% of salary on commuting allows commuters from both towns to access 4 stops. Interestingly, those willing to spend up to 4.7% of their salary are able to access 8-10 stops. In both cases, this accounts for over half of the stops on the railway lines (8 out of 14 stops from Merthyr Vale and 10 out of 15 stops from Brithdir).

These maps show the significant benefits that can be gained by those willing or able to commit to a 7-day season ticket.

So how affordable are these commutes to this potential workforce?

Relatively few studies have been undertaken to define commuting costs as a proportion of salaries, especially at the lowest pay scales and especially from towns outside of urban centres. Following a study into the comparative cost-of-living for London, Manchester and Edinburgh, it was found that, on average, commuting costs contributed to 4.1% of a family's' total spend (GLAeconomics, 2003: 15).

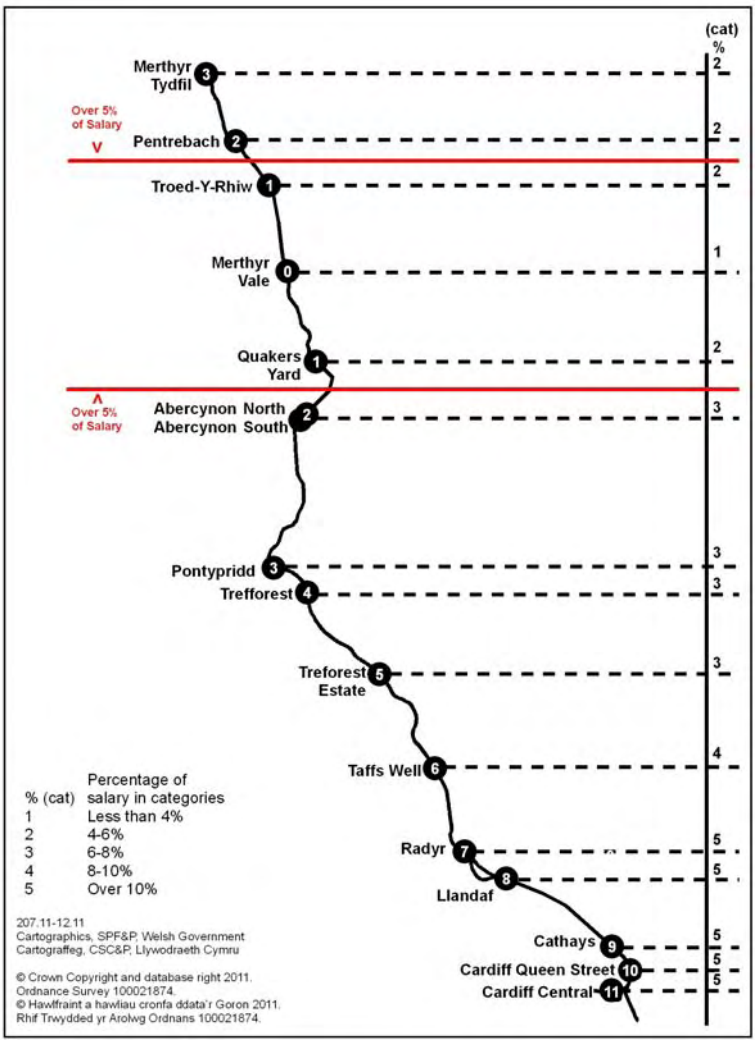
Because GLAeconomics' study looks at commuting costs up to several miles from the three city centres it is difficult to say how closely this figure of 4.1% reflects commuting costs in the three wider city regions. Further research is required to assess the willingness or/and ability of the lowest earners to pay more than 4.1% of their salary on commuting.

Despite this absence we can make some assumptions as to the expected differences between the urban centre and the wider city region. As part of the Joseph Rowntree Foundation's MIS programme[7], a survey was commissioned to compare the costs of living according to different household types and degrees of 'rurality'. Hirsch et al found that the minimum cost-of-living for most households in rural settings is 10-20% greater than equivalent households in urban locations (Hirsch et al, 2010). Their survey found that this additional expenditure was owing to increased transport and domestic fuel costs. Of these, the former was found to be the most significant representing between 60 and 100% of these additional costs. The worst cases were found to be areas suffering with very limited access to public transport and with no connection to a mains gas supply (Hirsch et al, 2010).

[7] Minimum Income Standard programme

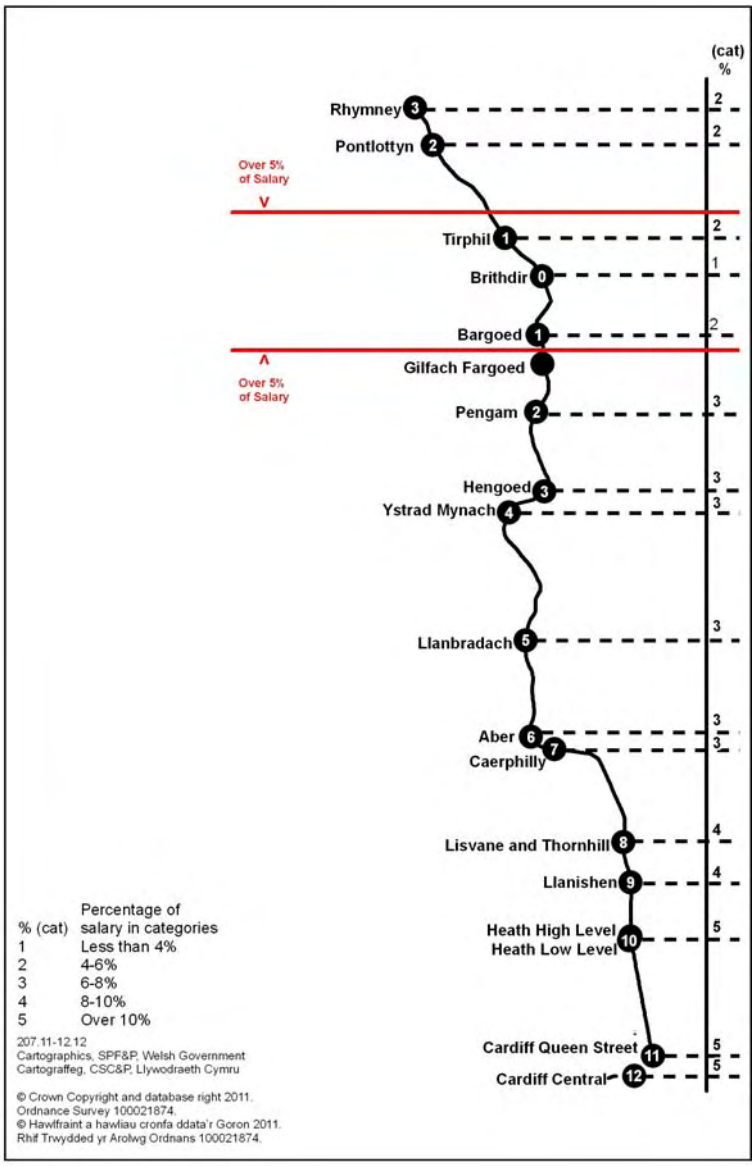
It is fair to assume that Merthyr Vale and Brithdir would not be classified as the most remote and rural areas of South East Wales. On this basis, we would not expect commuting costs in the urban parts of the city region to be exceeded by 20%. Assuming the figures by GLAeconomics can be applied to Cardiff, this suggests that the economically inactive living in Merthyr Vale and Brithdir should expect to spend no more than 5% of their salary on commuting (120% of 4.1%).

Figure 12: Percentage of salary required to commute from Merthyr Vale showing affordability cut-off (Day fare)



Source: National rail website; WG cartographics

Figure 13: Percentage of salary required to commute from Brithdir showing affordability cut-off (Day fare)

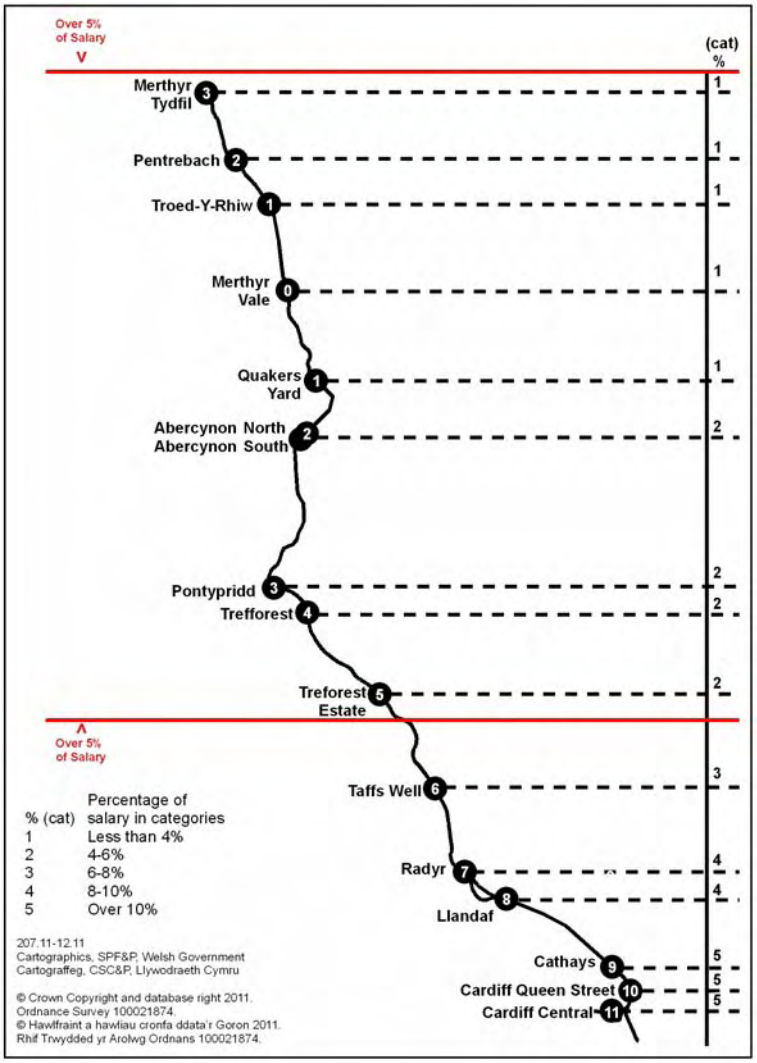


Source: National rail website; WG cartographics

Looking at affordability alone, these two maps show a short commutable radius for those commuting with a day fare ticket. This may begin to account for Clayton et al's observation that low-skilled workers are likely to commute shorter distances compared to high-skilled employees (Clayton et al, 2011: 10).

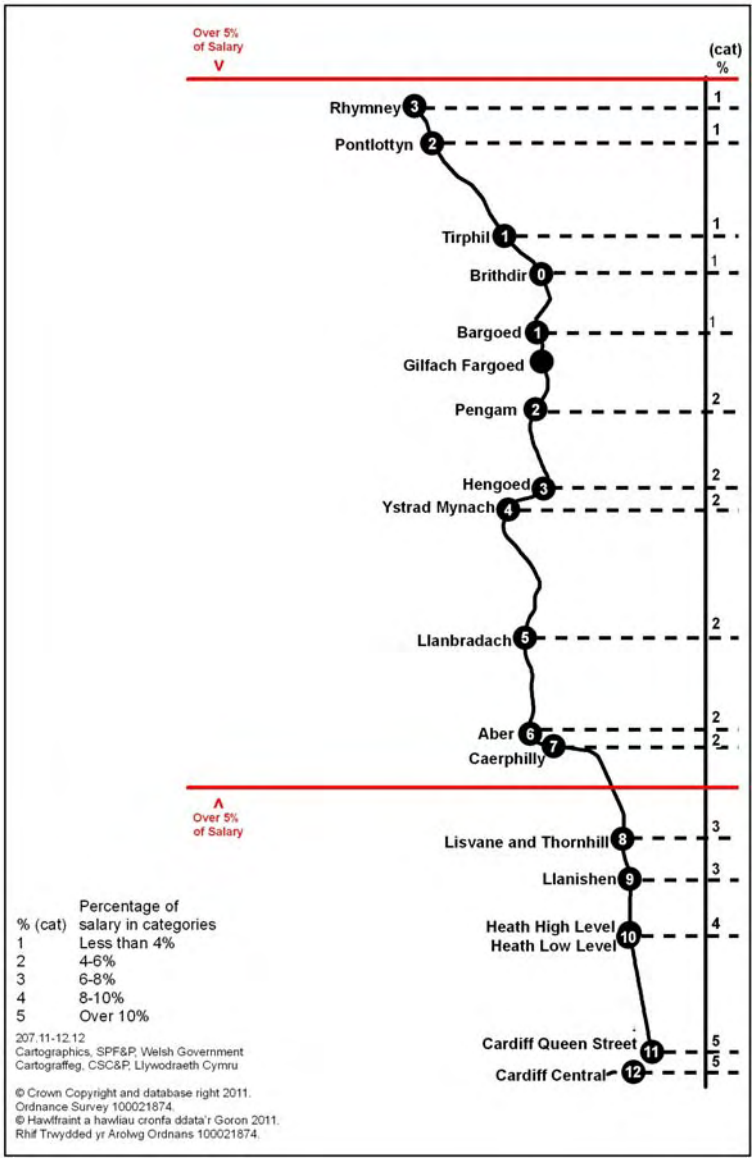
However, looking at the maps for 7 day season ticket holders, we see that the affordability range is significantly widened.

Figure 14: Percentage of salary required to commute from Merthyr Vale showing affordability cut-off (7 day season ticket)



Source: National rail website; WG cartographics

Figure 15: Percentage of salary required to commute from Brithdir showing affordability cut-off (7 day season ticket)



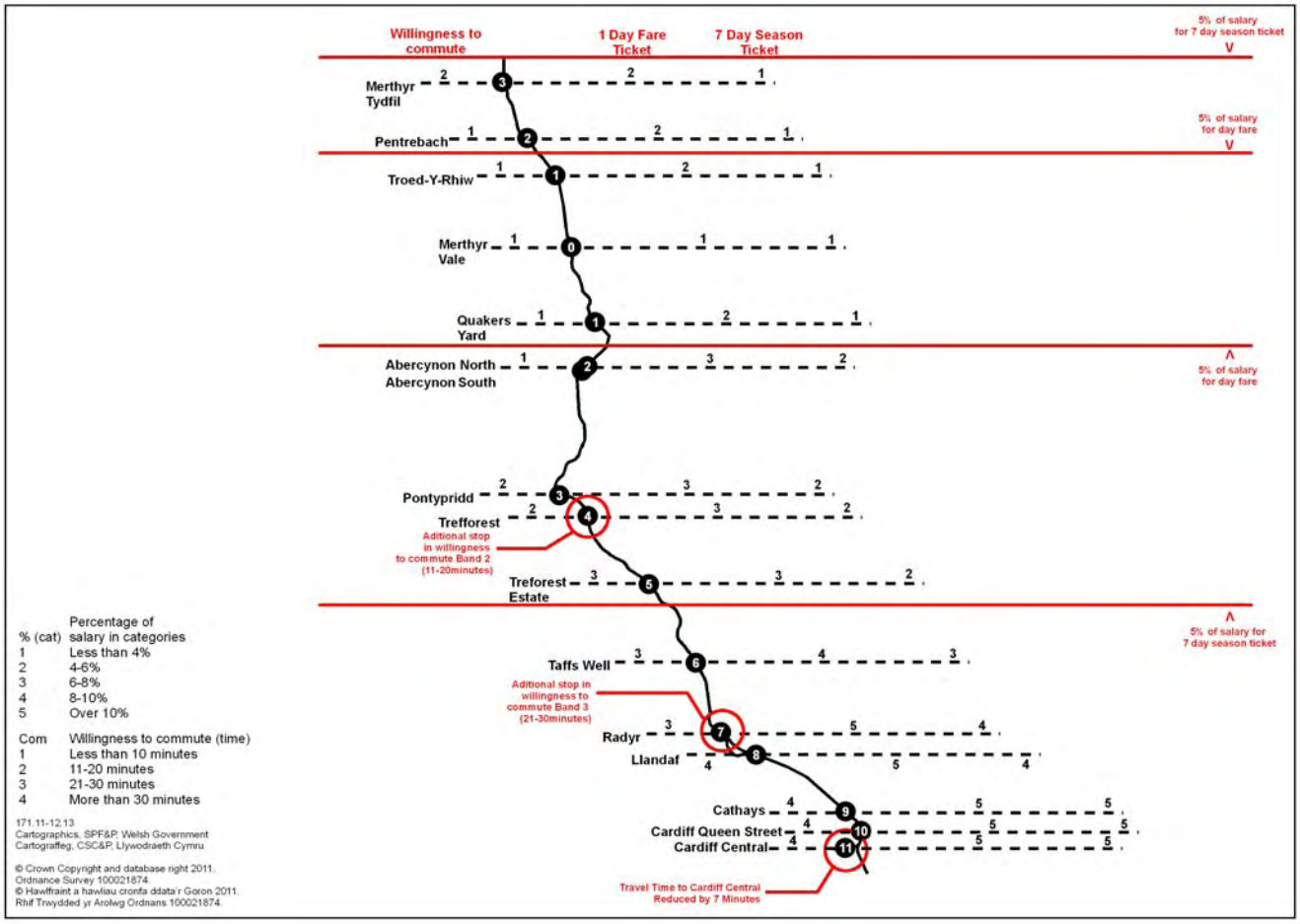
Source: National rail website; WG cartographics

In this scenario, commuters are able to travel as far as Trefforest Estate from Merthyr Vale and Caerphilly from Brithdir. This increases the number of accessible stops from 2 to 6 and 2 to 8 respectively.

So how does this finding affect the advantages gained by the faster train service reviewed in chapter three?

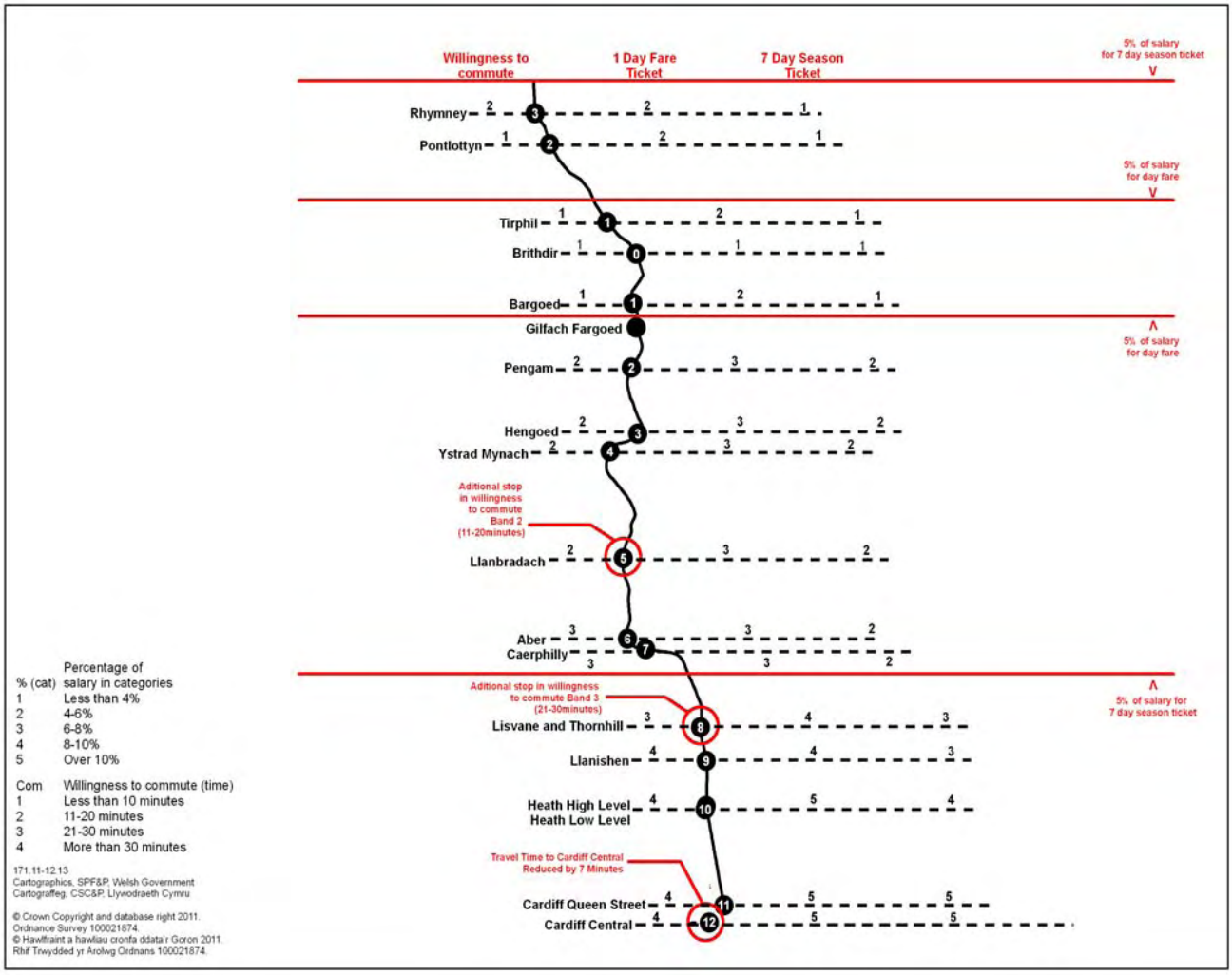
The following maps (Figures 16 and 17) bring together the commuting radii according to a faster train service and the costs of travel.

Figure 16: Comparison of commuting radii from Merthyr Vale according to a faster service and the costs of commuting (shown as day fare and 7 day season ticket season ticket)



Source: Blackaby et al, 2004: 77; National rail website; WG cartographics

Figure 17: Comparison of commuting radii from Brithdir according to a faster service and the costs of commuting (shown as day fare and 7 day season ticket season ticket)



Source: Blackaby et al, 2004: 77; National rail website; WG cartographics

In both maps we see that the costs of travel as a percentage of salary imposes significant limitations on the advantages gained from a faster service. Taking 5% of salary as a cut off point for likely affordability, commuters from both Merthyr Vale and Brithdir travelling on day fare can access only 2 stops. This does not allow such commuters to benefit from the three improvements offered by the VLE proposal. However, those same commuters travelling with a 7 day season ticket can access 8-10 stops in total. This allows them to benefit from one of the improvements offered by the VLE.

Conclusions

From the perspective of the economically inactive living in some of the poorest towns in the Valleys, these findings suggest that the cost of travel negates most of the benefits offered by the VLE proposal.

Given the costs of train fare, it is unlikely that commuters will benefit from the 7 minute reduced commute to the city centre, or the extended radius in the commuting band, 21-30 minutes. Only those willing or able to purchase a 7 day season ticket are able to benefit from the extended radius in the commuting band, 11-20 minutes.

5 Job Opportunities

There are likely to be suitable job opportunities within these commutable radii.

Up to this point in the analysis I have assumed that every stop can be treated equally. In this part I will explore where suitable employment is likely to be located and, thus, which stops should be considered as the most important to a potential workforce commuting from Merthyr Vale and Brithdir. I will look at this in four ways before concluding with policy recommendations:

(i) What are the employment prospects across the region?
(ii) Where is employment concentrated?
(iii) How do these employment areas relate to railway lines serving Merthyr Vale and Brithdir?
(iv) How do these stops relate to a faster train service?

(i) What are the employment prospects across the region?

Employment at different skill levels within each Local Authority

This part of the study will focus on Stats Wales' data for employment across local authorities.[8] Looking at the four local authorities serviced by the two lines discussed above, the table below breaks these figures down into percentages of total employment in the Local Authority. This allows us to consider the relative importance of each employment category.

This table also groups SOC categories according to predominant skill requirements (see UKCES, 2011 for reference). For the purpose of this study, these skills are broken into only two categories: above skill level 2 and skill level two or below (Figure 19). This corresponds with occupations that are

[8] Further research is needed to establish employment at the LSOA level to provide a much finer level of analysis and for further comparisons with Clayton et al's typologies (Clayton et al, 2011). See policy recommendations at close of study.

likely to be, or likely not to be suitable for the economically inactive (UKCES, 2011).

Figure 18: Key to percentage of employment relative to whole

% (cat)	Percentage of employment within SOC categories of employment
1	Less than 8%
2	8-10%
3	10-12%
4	12-14 %
5	Over 14%

Figure 19: Percentages of employment by type in four local authorities in South East Wales

	Predominant qualification level	Cardiff	Rhondda Cynon Taff	Merthyr Tydfil	Caerphilly
Managers and senior officials	Above level 2	17300 (11.4%)	11900 (12.4%)	1900 (8.5%)	8800 (12.7%)
Professional occupations	Above level 2	29200 (19.2%)	9000 (9.3%)	2100 (9.4%)	6600 (9.5%)
Associate Professional and technical	Above level 2	28900 (19%)	13300 (13.8)	3200 (14.3%)	9300 (13.4%)
Skilled trade occupations	Above level 2	10100 (6.6%)	11300 (11.7%)	2500 (11.2%)	9600 (13.8%)
Personal service occupations	Above level 2	14300 (9.4%)	11600 (12%)	2400 (10.7%)	6400 (9.2%)
Administrative and secretarial	Level 2 or below	17700 (11.6%)	10700 (11.1%)	2500 (11.2%)	9500 (13.7%)
Sales and customer service occupations	Level 2 or below	13000 (8.6%)	8700 (9%)	2000 (8.9%)	5700 (8.2%)
Process, plant and machine operatives	Level 2 or below	5600 (3.7%)	8900 (9.2%)	1700 (7.6%)	6400 (9.2%)
Elementary occupations	Level 2 or below	15900 (10.5%)	10900 (11.3%)	4100 (18.3%)	7200 (10.4%)

Source: based on Stats Wales data

General observations on employment in each area

The table shows that, in Cardiff, 3.7% of employment is in process, plant and machine operatives whilst 19% of employers are associate professional /

technical and 19.2% are in professional occupations. Whilst these two extremes reflect the higher and lower skilled jobs, this split is not consistent. 10.5% of employment is in elementary occupations and 11.6% is in administrative / secretarial occupations. Both these are in the middle percentage bands and represent lower skill levels.

After Cardiff, only Merthyr Tydfil has the highest category of employment in any one occupation. The table shows that 18.3% of employment in this Local Authority is in elementary occupations, and 14.3% is in associate professional and technical. These two high percentages of employment reflect lower and higher skilled work.

Rhondda Cynon Taff and Caerphilly show the most even spread of occupations with a range between 9% / 8.2% and 13.8%. This suggests that these two local authorities have more diverse job markets than both Cardiff and Merthyr Tydfil.

Overall it seems that employment ranges across skill levels in all local authorities, albeit to different degrees.

Low skilled employment across the Local Authorities

Whilst there are fewer jobs in low skilled work, there is more balance across all four types and across all four local authorities than higher skilled occupations. High levels of elementary occupations in Merthyr Tydfil, and low levels of process, plant and machine operatives in Cardiff stand out as the only real exceptions to this (Figure 19). These exceptions account for the differences between 46% low skilled work in Merthyr Tydfil, 41% in Caerphilly and Rhondda Cynon Taff and only 34% in Cardiff.

So how are these profiles likely to be affected by future job markets?

The fastest declining and inclining occupations

Looking at data between 2004 and 2009, the UKCES have reported the fastest declining and the fastest inclining occupations across Wales (UKCES, 2011). These trends, they argue, offer the basis for job forecasting beyond 2011. Out of the ten fastest declining occupations, only one, shopkeepers, require a qualification greater than level 2. Out of the ten fastest inclining occupations, only three require a skill level greater than 2[9].

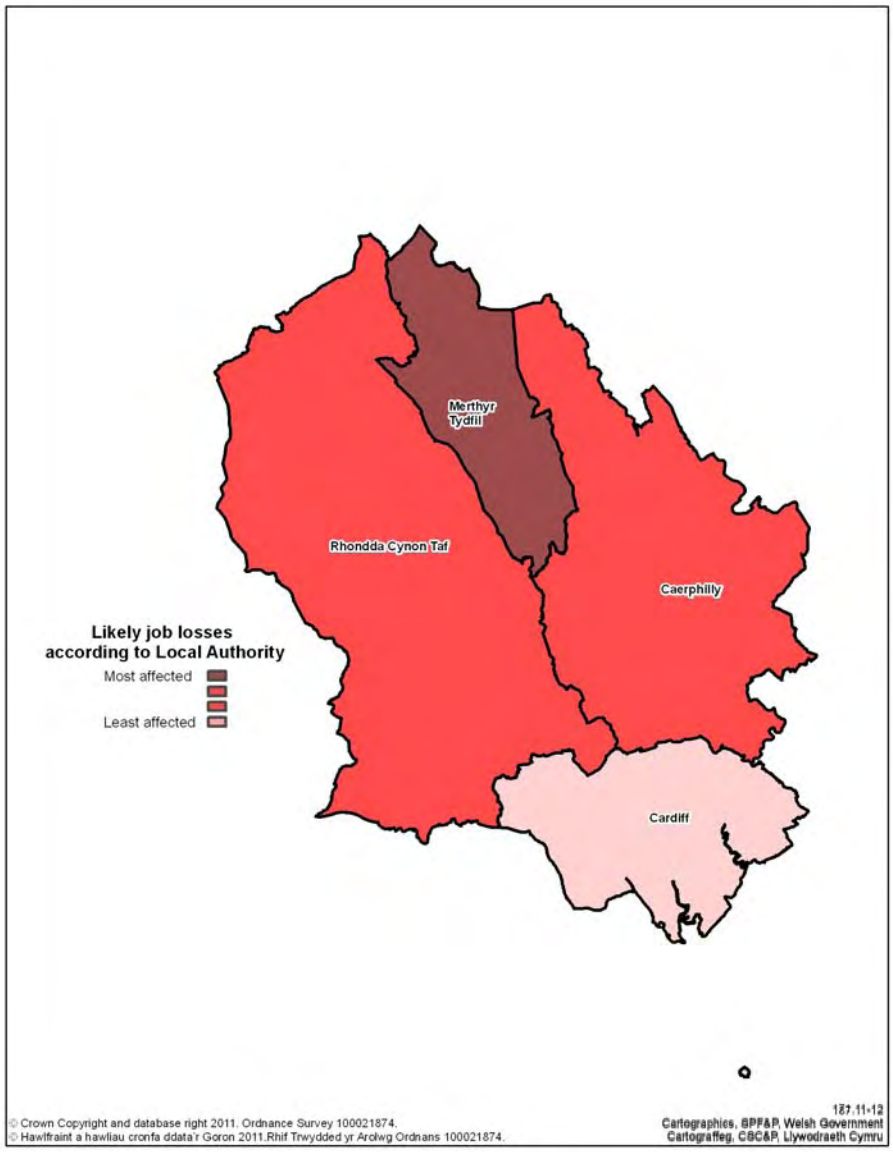
Job losses

On this basis, the UKCES report argues that, overall, there will be a noticeable reduction of jobs available to those seeking work in the lowest skill levels (UKCES, 2011: 51). It seems that elementary occupations and process, plan and machine operative occupations have and will continue to be the most affected by these trends.

Given the existing profile of employment, this suggests that Merthyr Tydfil will suffer from the greatest number of job losses across low skilled occupations, followed by Caerphilly or Rhondda Cynon Taff and finally Cardiff (Figure 20).

[9] These are: customer service occupations, food preparation trades and hairdressing

Figure 20: Indication of job losses in the lowest skilled occupations by Local Authority

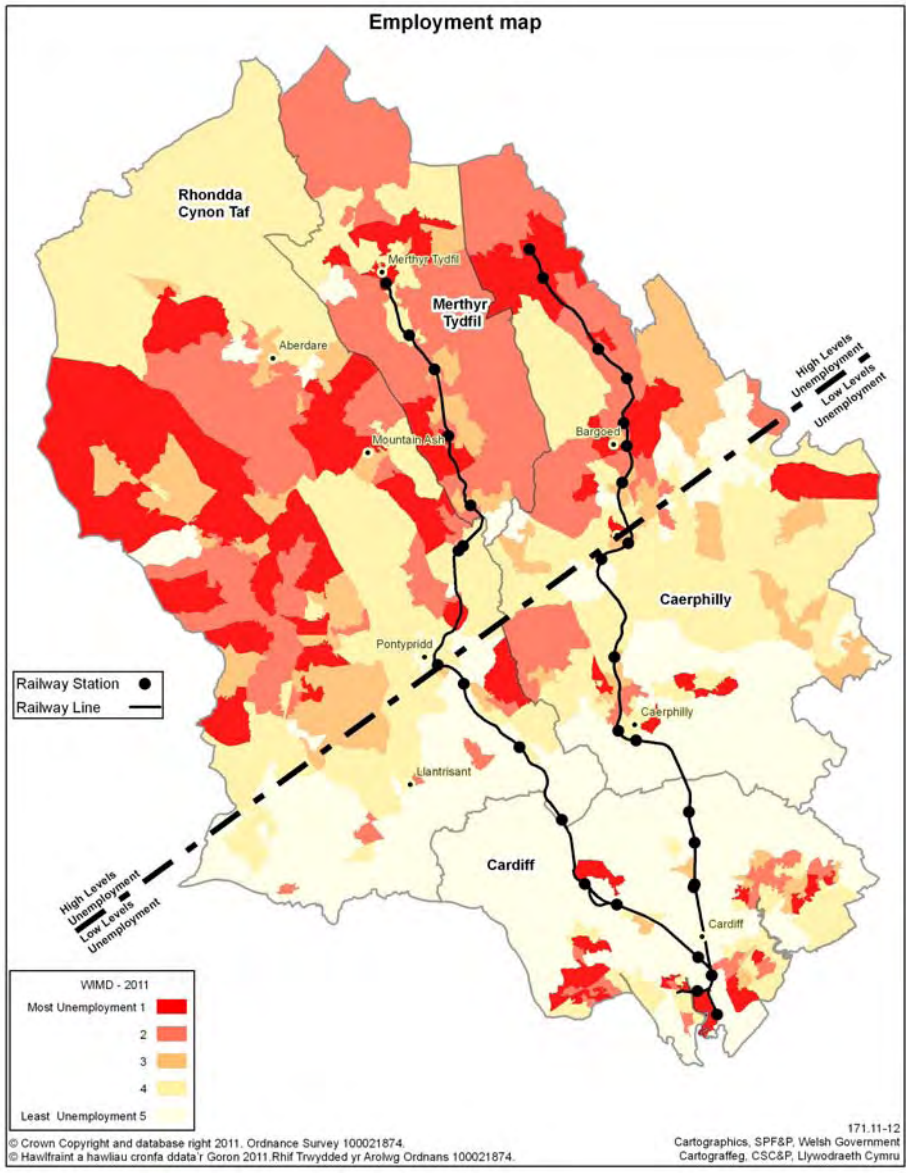


Source: UKCES, 2011; WG cartographics

Where is employment concentrated?

The north-south pattern of likely job losses can also be seen in the current rates of unemployment (Figure 21).

Figure 21: Current levels of unemployment across four of the local authorities in south east Wales



Source: Stats Wales WIMD data; WG cartographics

As shown in the above map, a dividing line can be drawn between high and low unemployment. This line roughly intersects the two railway lines at Pontypridd and Hengoed stations.

The similarity between occupation profiles (Figure 19), anticipated job losses in low skilled work and current unemployment suggests that this dividing line will become more pronounced over time. As a result, the demand for low-skilled work would increase in the Valleys relative to the more urban areas.

New jobs across the region are very unlikely to correct this trend. Looking back to Figure 19 it seems that the occupations likely to see the greatest increase in job numbers, customer services, is quite evenly distributed across the four areas[10]. This supports Clayton et al.'s argument that 'the dispersal of lower skilled employment is likely to continue as a trend in UK cities and city regions' (Clayton et al, 2011: 5).

(ii) So where are the concentrations of employment?

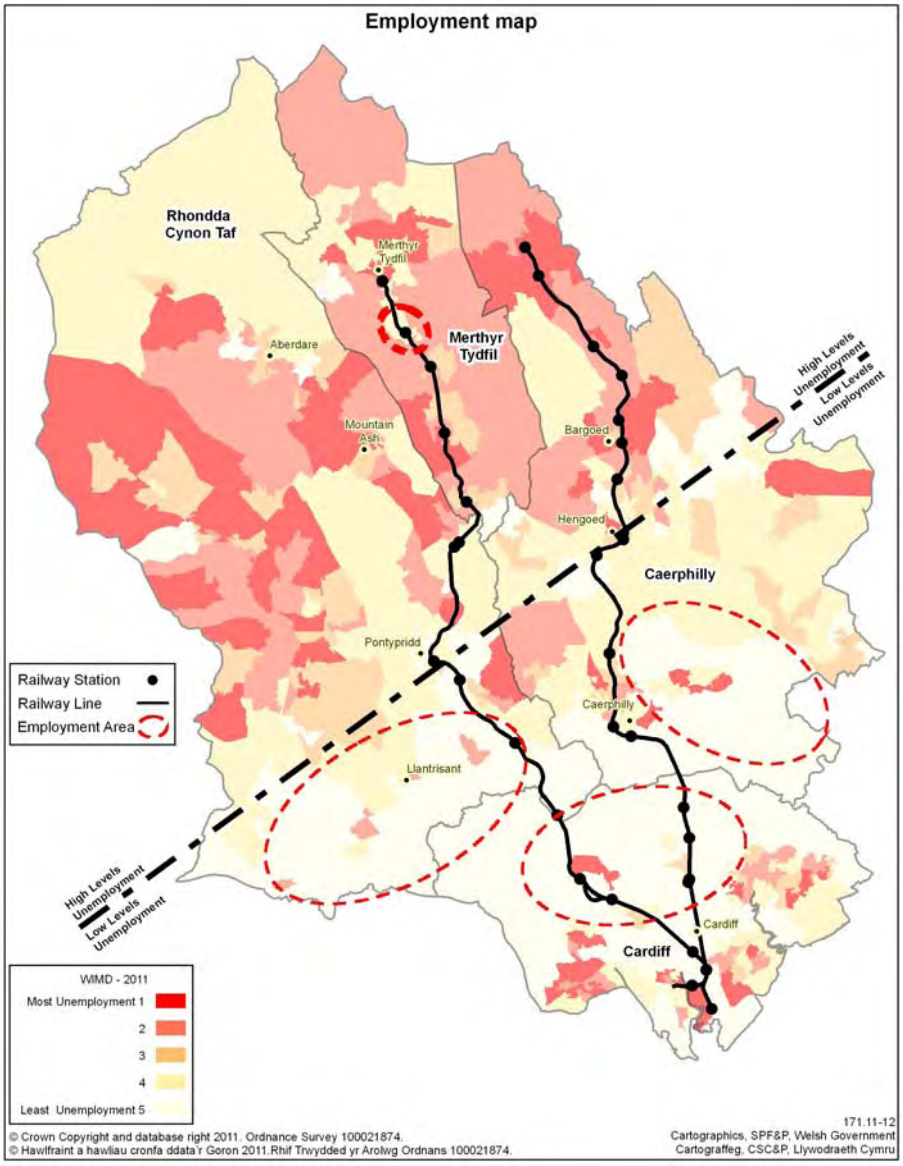
Given the even distribution of low skilled work across the city region[11] and the increased demand for low-skilled jobs in the Valleys, it seems reasonable to assume that the economically inactive would most likely find employment in areas with high levels of employment.

Using existing employment data, the map below defines such an area for each Local Authority (Figure 22).

[10] Please note that the data is defined by SOC categories, which combine sales and customer services. Further research is required to separate these two groups and to see whether or not this is different across local authorities. For the purpose of this report it has been assumed that the similar percentages across local authorities is representative of both sales and customer services.

[11] Evenly distributed across the local authorities though not necessarily within the local authorities. This requires further research. For the purpose of this study it is assumed that areas with greatest employment will be the focus for new jobs at all skill levels.

Figure 22: Map showing areas of high employment across four local authorities in south east Wales



Source: Stats Wales WIMD data; WG cartographics

Figure 22 shows that three of these four high employment areas are clustered together at the intersection between local authority boundaries, whilst the fourth area is centrally positioned in Merthyr Tydfil local authority.

(iii) How do these employment areas relate to railway lines serving Merthyr Vale and Brithdir?

For the VLE strategy to successfully relieve some of the barriers to employment for those living in the poorest parts of the Valleys it will need to provide viable access to these areas (Clayton et al, 2011: 14). Building on the findings in chapters three and four I have outlined the willingness to commute and costs of travel required to access these areas from Merthyr Vale and Brithdir.

Merthyr Vale

From Merthyr Vale, the Merthyr Tydfil–Cardiff Central line intersects with three pockets of employment. A small pocket is situated on the line around Pentrebach station. Looking back to Figure 6 we see that, from Merthyr Vale, this stop sits in willingness to commute band 1 (less than 10 minutes). To access this station, commuters must spend the following percentages of their salary:

Scenario 1 (day fare): 5.3%
Scenario 2 (7 day season ticket): 3.6%

This suggests that, whilst nearly all those interviewed would be willing to travel such short distance it would only be financially viable for those willing or able to purchase a season ticket.

Moving along the line, the area of high employment in the Rhondda Cynon Taff local authority can only be accessed by travelling beyond Pontypridd. This station falls within the willingness to commute band 2 (11-20 minutes). To access this station, commuters must spend the following percentages of their salary:

Scenario 1 (day fare): 6.4%
Scenario 2 (7 day season ticket): 4.7%

This suggests that, whilst 84% of respondents may be willing to commute this distance it would only be financially viable for those willing or able to purchase a season ticket.

The above map also highlights a further problem with access to employment opportunities in this local authority (Rhondda Cynon Taff). The train line only penetrates the easterly edge of the high employment area. To access the extent of this area, it is likely that a considerable amount of additional commuting will be required. Given that there are no east-westerly train connections in this area, it is likely that potential commuters would need to use other modes such as buses, walking or taxis. Not only will this increase commuting times, it will also increase costs and reduce likely take-up.

Moving along the line, the train enters the third area of high employment at Taffs Well station and penetrates the core zone of this area at Radyr station. Whilst both of these stations are in willingness to commute band 3 (21-30 minutes), they fall in different percentage of salary bands for both scenarios. To access these two stations, commuters must spend the following percentages of their salary:

Scenario 1 (day fare):	Taffs Well	8.4%	Radyr	11.3%
Scenario 2 (7 day season ticket):	Taffs Well	6.4%	Radyr	8.2%

Whilst this final zone of employment may be the most concentrated and best served by the train line with or without a season ticket it remains far beyond the financial viability of the 55% of the respondents willing to commute this far.

Brithdir

From Brithdir, the Rhymney-Cardiff Central line accesses only two areas with high levels of employment. These are both situated below Hengoed. This station is positioned in willingness to commute band 2 (11-21 minutes). To

access this station, commuters must spend the following percentages of their salary:

Scenario 1 (day fare): 6.4%
Scenario 2 (7 day season ticket): 4.7%

This suggests that, whilst 84% of respondents may be willing to commute this distance, it would only be financially viable for those willing or able to purchase a season ticket.

To access the highest levels of employment in Caerphilly local authority, commuters would need to travel further down the train line to Llanbradach. This station is also in willingness to commute band 2 (11-21 minutes). To access this station, commuters must spend the following percentages of their salary:

Scenario 1 (day fare): 6.4%
Scenario 2 (7 day season ticket): 4.7%

This suggests that, whilst 84% of respondents may be willing to commute this distance, it would only be financially viable for those willing or able to purchase a season ticket. However, as was the case on the Merthyr Tydfil-Cardiff Central line, this only penetrates the edge of the employment area. This requires commuters to spend more time and cost to reach the easterly extent of this area.

To access the high employment zone in the Cardiff local authority, commuters from Brithdir would need to travel as far as Lisvane and Thornhill. This is within willingness to commute band 3 (21-30 minutes). To access this station, commuters must spend the following percentages of their salary:

Scenario 1 (day fare): 8.4%
Scenario 2 (7 day season ticket): 6.4%

Whilst this final zone of employment may be the most concentrated and best served by the train line with or without a season ticket it remains far beyond the financial viability of the 55% of the respondents willing to commute this far.

The above is summarised in the following tables: Figures 23 and 24.

Figure 23: Table of stops providing access to areas of high employment from Merthyr Vale

	Station	Potential workforce	Affordability as % of salary (day fare)	Affordability as % of salary (7 day season ticket)
Breaking the dividing line 'high/low unemployment'	Pontypridd	Upto 84%	6.4%	4.7%
Access to high employment area in Merthyr Tydfil Local Authority	Pentrebach	Upto 100%	5.3%	3.6%
Access to high employment area in Rhondda Cynon Taff Local Authority	Pontypridd	Upto 84%	6.4%	4.7%
Access to high employment area in Cardiff Local Authority	Radyr	Upto 55%	11.3%	8.2%

Figure 24: Table of stops providing access to areas of high employment from Brithdir

	Station	Potential workforce	Affordability as % of salary (day fare)	Affordability as % of salary (7 day season ticket)
Breaking the dividing line 'high/low unemployment'	Hengoed	Upto 84%	6.4%	4.7%
Access to high employment area in Caerphilly Local Authority	Llanbradach	Upto 84%	6.4%	4.7%
Access to high employment area in Cardiff Local Authority	Lisvane and Thornhill	Upto 55%	8.4%	6.4%

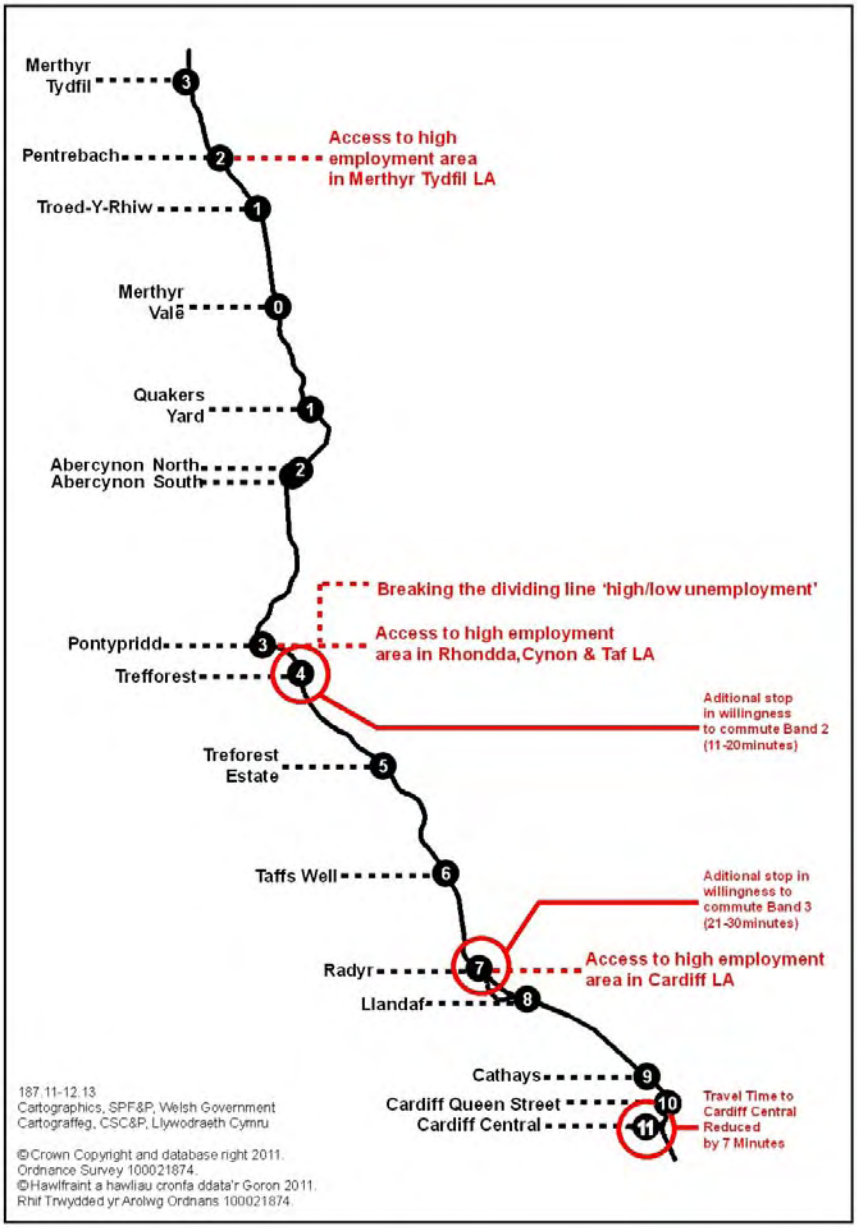
These tables show that a high percentage of the potential workforce is willing to commute to areas of high employment. However, for those not willing or

unable to purchase a season ticket this seems to be heavily restricted by unaffordable commuting costs.

(iv) How do these stops relate to a faster train service?

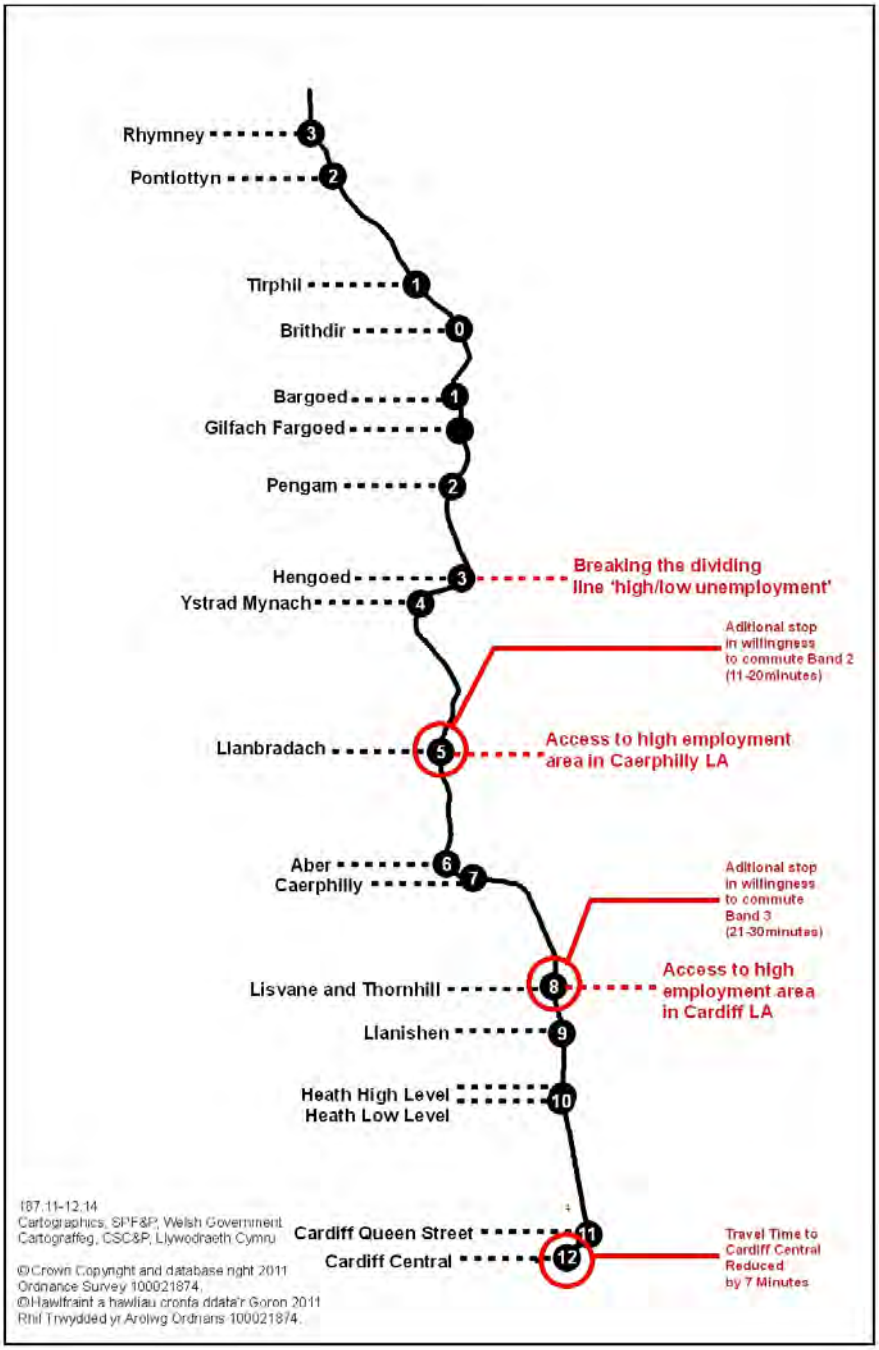
The two maps below relate these findings to the improvements made by a faster train service.

Figure 25: Map of relationship between main stops for access to high employment and improved service from Merthyr Vale



Source: National rail website; WG cartographics

Figure 26: Map of relationship between main stops for access to high employment and improved service from Brithdir



Source: National rail website; WG cartographics

The above maps show that the stops needed to access areas of employment correspond with the additional stops from a faster service. This suggests that the VLE strategy could allow a high proportion of potential commuters from

Merthyr Vale and Brithdir to access more jobs. However, most of these benefits would only be felt assuming affordability can be improved.

6 Policy Recommendations

In this report I have shown that there is reason to believe that the VLE strategy could help relieve barriers to employment for the economically inactive living in the poorest parts of the Valleys. However, considering the findings above I would like to offer the following policy recommendation to accompany such proposals:

Re-balancing the relationship between cost and improvements

This report recommends that future policy should focus on improving the affordability of the VLE service to help the economically inactive benefit from the strategy. This may be achieved by a combination of:

- reduced or subsidised fare for target groups,
- increasing the willingness and ability of such groups to purchase season tickets,
- increasing the willingness of such groups to spend the greatest affordable percentage of their salary on commuting costs.

This reflects one of the recommendations made by the Centre for Cities group, which noted that:

> ‘partners, including employment support providers and local transport authorities, should consider mechanisms to make public transport more affordable for job seekers and individuals on low incomes’
> (Clayton et al, 2011: 3)

7 Limitations of the Study

This study has been structured according to the data sources available at the time of drafting. Some of this data introduces a number of assumptions which will need to be investigated in more detail through further study. These are summarised below:

- **Train fare will not increase**

  In addition to discussions with train operators, further research would need to gather data on the history of train fares across the UK prior to and following electrification.

- **Increased speed will be consistent across the lines**

  It should be noted that this does not allow for any additional stops provided within the network. The benefits of such stops will need to be weighed against the reduction in travel times.

- **The affordability of commuting costs**

  There is limited information on the amount of money spent on commuting costs in the UK across all skill levels and no data for commuting costs across the Cardiff city region for different skill levels. Further data is needed to see if the 4.1% and 5% figures used in this report are representative.

- **Scale of employment data**

  Employment data is based on the LO not the LSOA scale. This limits the assessment of train stops across the network. Additionally, the lack of such data prevents comparison with similar reports conducted across the UK. Clayton et al's 2011 report, for example, conducts a similar study across four city region types. Cross comparisons with these findings could allow for the exchange of best practice and lessons learned.

- **Areas of high employment**

Given the restricted data on employment within the LO, this study has assumed that most job opportunities will be available within areas of high employment. Further research will be required to validate this assumption.

- **Impacts of future projects and investments**

This research does not allow for the impact of large scale projects currently under discussion. If the Cardiff Business District is approved, for example, then we may see a significant increase in the number of high skilled employment opportunities in Cardiff's city centre. Studies will need to be undertaken to see how far such schemes will affect the employment profiles of the four local authorities.

- **Access from train stop to train stop**

For simplicity, this report looks at commuting from stop to stop. However, most commuters will not live or work adjacent to the train stops. Future research is required to factor this into willingness to commute data.

- **Other towns**

This study focuses on two towns: Merthyr Vale and Brithdir. These towns were selected according to one indicator: unemployment levels. Further studies will be required that draw on other indicators.

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Appendix

Table 1: Key to willingness to commute as defined in tables 2 and 3

Com	Willingness to commute (time)
1	Less than 10 minutes
2	11-20 minutes
3	21-30 minutes
4	More than 30 minutes

Table 2: Time taken (existing and proposed) to travel from Merthyr Vale compared to willingness to commute

Existing				Proposed	
Com (ref)	Time (mins)	Stop (no.)	Name	Time (mins)	Com (ref)
2	16	3	Merthyr Tydfil	13.6	2
1	7	2	Pentre-Bach	6	1
1	3	1	Troed-y-Rhiw	2.5	1
1	0	0	**Merthyr Vale**	0	1
1	5	1	Quakers Yard	4.3	1
1	9	2	Abercynon	7.7	1
2	17	3	Pontypridd	14.5	2
3	21	4	Trefforest	17.9	2
3	26	5	Trefforest Estate	22.1	3
3	30	6	Taffs Well	25.5	3
4	33	7	Radyr	28	3
4	36	8	LLandaf	30.6	4
4	40	9	Cathays	34	4
4	44	10	Cardiff Queen St.	37.4	4
4	49	11	Cardiff Central	41.7	4

Table 3: Time taken (existing and proposed) to travel from Brithdir compared to willingness to commute

Existing				Proposed	
Com (ref)	Time (mins)	Stop (no.)	Name	Time (mins)	Com (ref)
2	14	3	Rhymney	12	2
1	7	2	Pontlottyn	6	1
1	3	1	Tir-Phil	2.5	1
1	0	0	**Brithdir**	0	1
1	3	1	Bargoed	2.5	1
2	13	2	Pengam	11	2
2	16	3	Hengoed	13.6	2
2	19	4	Ystrad Mynach	16.2	2
3	24	5	Lanbradach	20.4	2
3	28	6	Aber	23.8	3
3	30	7	Caerphilly	25.5	3
4	35	8	Lisvane and Thornhill	29.8	3
4	37	9	Llanishen	31.5	4
4	40	10	Heath High level	34	4
4	45	11	Cardiff Queen Street	38.3	4
4	48	12	Cardiff Central	40.8	4

Table 4: Key to percentage of salary required to pay for train fare

% (cat)	Percentage of salary in categories
1	Less than 4%
2	4-6%
3	6-8%
4	8-10%
5	Over 10%

Table 5: Percentage of salary required to travel from Merthyr Vale

Current and proposed valleys rail network							
Price (£) Day fare	% of wage	Price (£) 7 day season ticket	% of wage	Price (£) 1 month season ticket	% of wage	Stop (no.)	Name
2.60	5.3	1.78	3.6	1.55	3.2	3	Merthyr Tydfil
2.60	5.3	1.78	3.6	1.55	3.2	2	Pentre-Bach
2	4.1	1.32	2.7	1.15	2.4	1	Troed-y-Rhiw
0	0	0	0	0	0	0	**Merthyr Vale**
2	4.1	1.32	2.7	1.15	2.4	1	Quakers Yard
3.10	6.4	2.28	4.7	1.99	4.1	2	Abercynon
3.10	6.4	2.28	4.7	1.99	4.1	3	Pontypridd
3.10	6.4	2.28	4.7	1.99	4.1	4	Trefforest
3.10	6.4	2.28	4.7	1.99	4.1	5	Trefforest Estate
4.10	8.4	3.14	6.4	2.74	5.6	6	Taffs Well
5.50	11.3	4	8.2	3.49	7.2	7	Radyr
5.50	11.3	4	8.2	3.49	7.2	8	LLandaf
6.80	14	5.04	10.4	4.40	9	9	Cathays
6.80	14	5.04	10.4	4.40	9	10	Cardiff Queen St.
6.80	14	5.04	10.4	4.40	9	11	Cardiff Central

Table 5a: Percentage of salary required to travel from Merthyr Vale using day fare

Current and proposed valleys rail network				
Price (£) Day fare	% of wage	category	Stop (no.)	Name
2.60	5.3	2	3	Merthyr Tydfil
2.60	5.3	2	2	Pentre-Bach
2	4.1	2	1	Troed-y-Rhiw
0	0	1	0	**Merthyr Vale**
2	4.1	2	1	Quakers Yard
3.10	6.4	3	2	Abercynon
3.10	6.4	3	3	Pontypridd
3.10	6.4	3	4	Trefforest
3.10	6.4	3	5	Trefforest Estate
4.10	8.4	4	6	Taffs Well
5.50	11.3	5	7	Radyr
5.50	11.3	5	8	LLandaf
6.80	14	5	9	Cathays
6.80	14	5	10	Cardiff Queen St.
6.80	14	5	11	Cardiff Central

Table 5b: Percentage of salary required to travel from Merthyr Vale using 7 day season ticket

Current and proposed valleys rail network				
Price (£) 7 day season ticket	% of wage	category	Stop (no.)	Name
1.78	3.6	1	3	Merthyr Tydfil
1.78	3.6	1	2	Pentre-Bach
1.32	2.7	1	1	Troed-y-Rhiw
0	0	1	0	**Merthyr Vale**
1.32	2.7	1	1	Quakers Yard
2.28	4.7	2	2	Abercynon
2.28	4.7	2	3	Pontypridd
2.28	4.7	2	4	Trefforest
2.28	4.7	2	5	Trefforest Estate
3.14	6.4	3	6	Taffs Well
4	8.2	4	7	Radyr
4	8.2	4	8	LLandaf
5.04	10.4	5	9	Cathays
5.04	10.4	5	10	Cardiff Queen St.
5.04	10.4	5	11	Cardiff Central

Table 5c: Percentage of salary required to travel from Merthyr Vale using 1 month season ticket

Current and proposed valleys rail network				
Price (£) 1 month season ticket	% of wage	category	Stop (no.)	Name
1.55	3.2	1	3	Merthyr Tydfil
1.55	3.2	1	2	Pentre-Bach
1.15	2.4	1	1	Troed-y-Rhiw
0	0	1	0	**Merthyr Vale**
1.15	2.4	1	1	Quakers Yard
1.99	4.1	2	2	Abercynon
1.99	4.1	2	3	Pontypridd
1.99	4.1	2	4	Trefforest
1.99	4.1	2	5	Trefforest Estate
2.74	5.6	2	6	Taffs Well
3.49	7.2	3	7	Radyr
3.49	7.2	3	8	LLandaf
4.40	9	4	9	Cathays
4.40	9	4	10	Cardiff Queen St.
4.40	9	4	11	Cardiff Central

Table 6: Percentage of salary required to travel from Brithdir

Current and proposed valleys rail network							
Price (£) Day fare	% of wage	Price (£) 7 day season ticket	% of wage	Price (£) 1 month season ticket	% of wage	Stop (no.)	Name
2.60	5.3	1.78	3.6	1.55	3.2	3	Rhymney
2.60	5.3	1.78	3.6	1.55	3.2	2	Pontlottyn
2	4.1	1.32	2.7	1.15	2.4	1	Tir-Phil
0	0	0	0	0	0	0	**Brithdir**
2	4.1	1.32	2.7	1.15	2.4	1	Bargoed
3.10	6.4	2.28	4.7	1.99	4.1	2	Pengam
3.10	6.4	2.28	4.7	1.99	4.1	3	Hengoed
3.10	6.4	2.28	4.7	1.99	4.1	4	Ystrad Mynach
3.10	6.4	2.28	4.7	1.99	4.1	5	Lanbradach
3.10	6.4	2.28	4.7	1.99	4.1	6	Aber
3.10	6.4	2.28	4.7	1.99	4.1	7	Caerphilly
4.10	8.4	3.14	6.4	2.74	5.6	8	Lisvane and Thornhill
4.10	8.4	3.14	6.4	2.74	5.6	9	Llanishen
5.50	11.3	4	8.2	3.49	7.2	10	Heath High level
6.80	14	5.04	10.4	4.40	9	11	Cardiff Queen Street
6.80	14	5.04	10.4	4.40	9	12	Cardiff Central

Table 6a: Percentage of salary required to travel from Brithdir using day fare

Current and proposed valleys rail network				
Price (£) Day fare	% of wage	category	Stop (no.)	Name
2.60	5.3	2	3	Rhymney
2.60	5.3	2	2	Pontlottyn
2	4.1	2	1	Tir-Phil
0	0	1	0	**Brithdir**
2	4.1	2	1	Bargoed
3.10	6.4	3	2	Pengam
3.10	6.4	3	3	Hengoed
3.10	6.4	3	4	Ystrad Mynach
3.10	6.4	3	5	Lanbradach
3.10	6.4	3	6	Aber
3.10	6.4	3	7	Caerphilly
4.10	8.4	4	8	Lisvane and Thornhill
4.10	8.4	4	9	Llanishen
5.50	11.3	5	10	Heath High level
6.80	14	5	11	Cardiff Queen Street
6.80	14	5	12	Cardiff Central

Table 6b: Percentage of salary required to travel from Brithdir using 7 day season ticket

Current and proposed valleys rail network				
Price (£) 7 day season ticket	% of wage	category	Stop (no.)	Name
1.78	3.6	1	3	Rhymney
1.78	3.6	1	2	Pontlottyn
1.32	2.7	1	1	Tir-Phil
0	0	1	0	**Brithdir**
1.32	2.7	1	1	Bargoed
2.28	4.7	2	2	Pengam
2.28	4.7	2	3	Hengoed
2.28	4.7	2	4	Ystrad Mynach
2.28	4.7	2	5	Lanbradach
2.28	4.7	2	6	Aber
2.28	4.7	2	7	Caerphilly
3.14	6.4	3	8	Lisvane and Thornhill
3.14	6.4	3	9	Llanishen
4	8.2	4	10	Heath High level
5.04	10.4	5	11	Cardiff Queen Street
5.04	10.4	5	12	Cardiff Central

Table 6c: Percentage of salary required to travel from Brithdir using 1 month season ticket

Current and proposed valleys rail network				
Price (£) 1 month season ticket	% of wage	category	Stop (no.)	Name
1.55	3.2	1	3	Rhymney
1.55	3.2	1	2	Pontlottyn
1.15	2.4	1	1	Tir-Phil
0	0	1	0	**Brithdir**
1.15	2.4	1	1	Bargoed
1.99	4.1	2	2	Pengam
1.99	4.1	2	3	Hengoed
1.99	4.1	2	4	Ystrad Mynach
1.99	4.1	2	5	Lanbradach
1.99	4.1	2	6	Aber
1.99	4.1	2	7	Caerphilly
2.74	5.6	2	8	Lisvane and Thornhill
2.74	5.6	2	9	Llanishen
3.49	7.2	3	10	Heath High level
4.40	9	4	11	Cardiff Queen Street
4.40	9	4	12	Cardiff Central