

REPORT 70024089

# THE PENISTONE LINE STUDY

FEASIBILITY STUDY

CONFIDENTIAL

APRIL 2017

# THE PENISTONE LINE

## FEASIBILITY STUDY

**West Yorkshire Combined Authority**

**DRAFT**  
**Confidential**

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## APPENDICES

<b>A P P E N D I X   A</b>	<b>PDFH CALCULATIONS</b>
<b>A P P E N D I X   B</b>	<b>STATION PRO FORMAS</b>

# 1 INTRODUCTION

## 1.1 OVERVIEW

- 1.1.1 WSP | Parsons Brinkerhoff (WSP | PB) has been commissioned by the West Yorkshire Combined Authority (WYCA) to undertake a high level feasibility study of the potential for park and ride to succeed on the Penistone Line in West Yorkshire.
- 1.1.2 The geographical scope of this study is the seven Penistone Line stations in West Yorkshire: Lockwood, Berry Brow, Honley, Brockholes, Stocksmoor, Shepley and Denby Dale.
- 1.1.3 The goal of the study is to assess the value of park and ride on the Penistone Line as a whole in order to determine whether further, more detailed feasibility work, examining options for parking expansion at particular stations, is justified. The study also seeks to offer a steer as to where, on the line, investment in parking capacity is likely to deliver the most value.
- 1.1.4 The report extends the work previously undertaken by WSP | PB on the Parking Enhancement at Rail Stations (PEARS) commission. While the scope of the first stage of this study incorporated all stations in West Yorkshire at a high level, the second stage, which comprised detailed feasibility studies of 37 stations, did not include the Penistone Line stations.

## 1.2 STRUCTURE OF REPORT

- 1.2.1 Following this introduction, section 2 of this report defines the catchment area of stations on the Penistone Line and analyses commuting patterns in this catchment area. This is used to reach a judgement on the potential for effecting a modal shift from car to park and ride in the catchment area of the Penistone Line.
- 1.2.2 Section 3 provides a high level assessment of the extent to which expanding car parking capacity at each of the Penistone Line stations would represent value for money. It considers the opportunities and constraints surrounding possible sites for car parking provision in the vicinity of Penistone Line stations.
- 1.2.3 Section 4 considers the competitiveness of rail against other modes for journeys to work in key employment destinations in the North of England. By exploring infrastructural and operational opportunities and constraints, it then evaluates the likelihood that service levels on the Penistone Line could be enhanced.
- 1.2.4 Section 5 investigates the extent to which future development in the vicinity of the Penistone Line stations may increase the demand for park and ride services on the line. To do this, this section examines the residential site allocations near to Penistone Line stations and calculates the trips that might be expected as a result of these developments.
- 1.2.5 The report concludes with an indication on the potential for park and ride to succeed on the Penistone Line.



# 2 ANALYSIS OF RAIL CATCHMENTS

## 2.1 METHODOLOGY

2.1.1 The purpose of this section is to analyse commuting patterns in the vicinity of the Penistone Line stations in West Yorkshire to assess the likelihood of modal shift to park and ride should there be an expansion of parking capacity at railway stations on the Penistone Line.

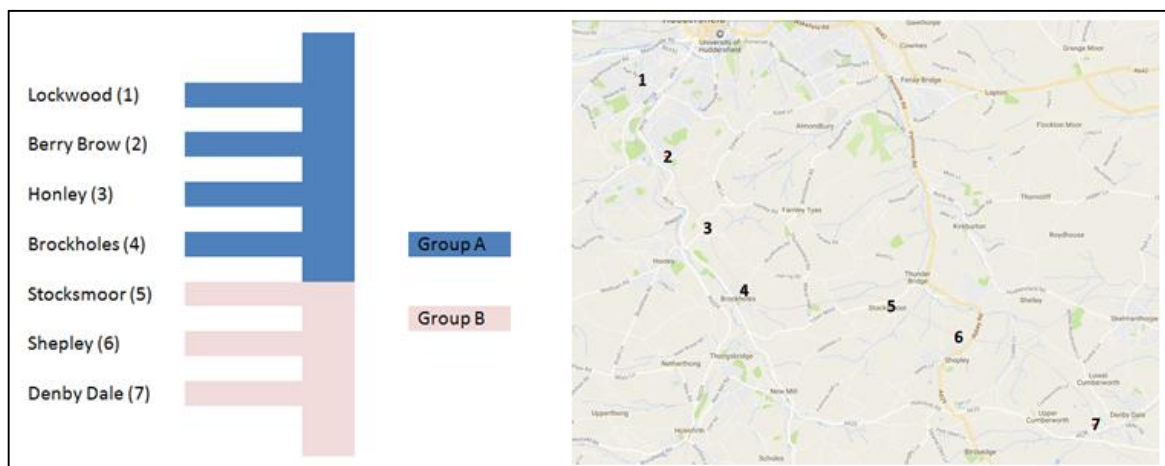
### CATCHMENT AREAS

2.1.2 At the outset, it was necessary to define the area in which commuting patterns would be analysed. The Penistone Line stations were divided into two groups:

- Group A: Lockwood, Berry Brow, Honley and Brockholes; and
- Group B: Stocksmoor, Shepley and Denby Dale.

2.1.3 Figure 2.1 clearly demonstrates which stations fall within each group and where those stations are located.

**Figure 2-1 Groups and station locations**



2.1.4 This division was made on the basis that there is a clear geographical distinction between the two areas: Group A is more urban in character and comprises larger settlements located closer to Huddersfield, while Group B is more rural and composed smaller settlements on the south-eastern edge of the Kirklees district. It was assumed that this difference would generate distinctive patterns of commuting, so it would be logical to analyse them separately.

2.1.5 To define the catchment area for stations in each group, a 5km driving isochrone was plotted from each of the stations on the line. A 5km driving isochrone was chosen because it represents the furthest distance that a potential park and ride user might be reasonably expected to drive to use a station on the Penistone Line. In addition, at distances greater than this, catchments between stations start to overlap.

2.1.6 These isochrones were combined for stations in each group, as shown in figure 2-2 and 2-3, to produce a 5km driving isochrone for each group as a whole.

Figure 2-2 – Catchment area for Group A

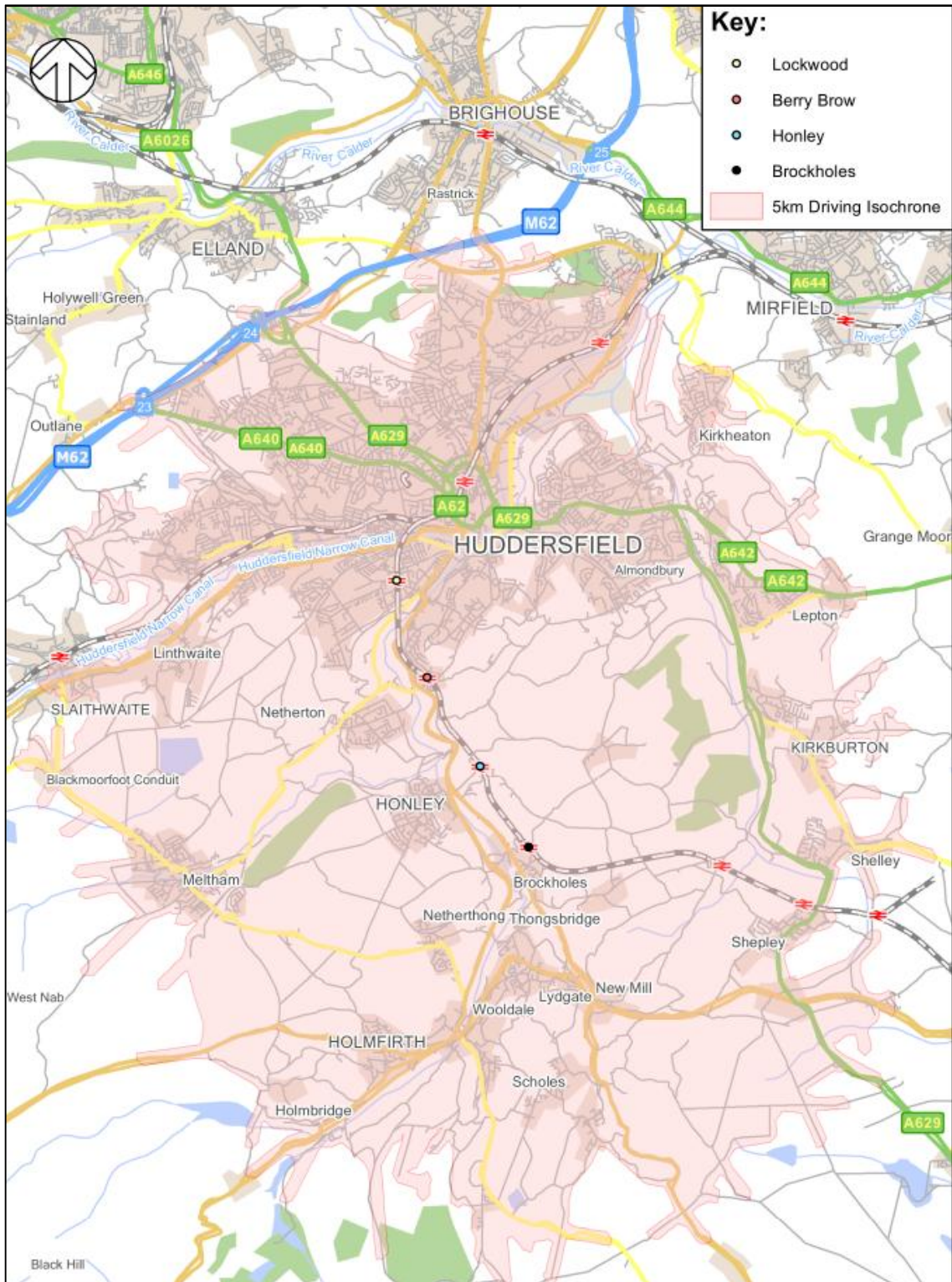
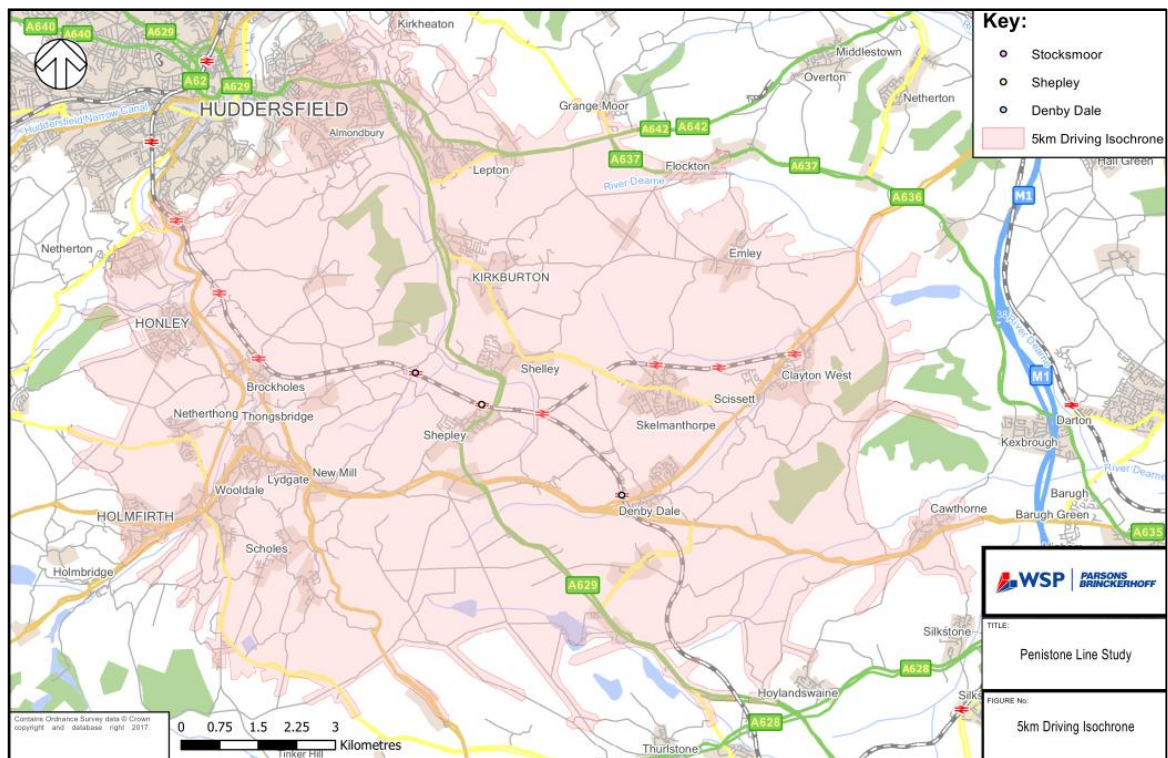


Figure 2-3 – Catchment area for Group B



## IDENTIFYING COMMUTING PATTERNS

- 2.1.7 Two key aspects of commuting patterns within these catchment areas were identified using data from the 2011 UK census:
- The destination split for residents of the catchment area; and
  - The modal split for residents of the catchment area.
- 2.1.8 In order to identify these characteristics of commuting patterns in the catchment areas, it was necessary to map Middle Super Output Areas (MSOAs) onto the catchment areas. The MSOA is the lowest level at which data for both of these characteristics were captured in the 2011 UK Census.
- 2.1.9 MSOAs were selected that fell partly or wholly in the two catchment areas. A sense check was applied to the selection of MSOAs to ensure that it was logical to assume that the majority of the population of the MSOA might drive to a Penistone Line station for onward travel to Huddersfield. This exercise did not take into account service levels on the Penistone Line but, rather, considered whether residents of these MSOAs might be expected to use a Penistone Line station based on its accessibility from their home.



- 2.1.10 The MSOAs that were selected are also shown in table 2-1. Where an MOSA appeared in the catchment of both groups, a judgement was made to include it in only one group to avoid double-counting. This was based on the relative accessibility of the stations in each group to that MOSA.

**Table 2-1 – MSOAs used**

MOSA	GROUP	MAIN SETTLEMENTS
K043	Group A	Lockwood, Thornton Lodge
K047	Group A	Crossland Moor
K048	Group A	Newsome, Berry Brow
K050	Group A	Netherton
K053	Group A	Honley, Oldfield, Brockholes, Thorstonland
K055	Group A	Meltham
K058	Group A	Upperthong, Netherthong
K059	Group A	Holmfirth, New Mill, Hepworth
K051	Group B	Stocks Moor, Farnley Tyas
K054	Group B	Emley
K056	Group B	Shepley, Shelley
K057	Group B	Denby Dale, Upper Cumberworth, Scissett, Clayton West

- 2.1.11 Two MOSAs that fell partly or wholly within the 5km driving catchment areas were excluded from the scope of our calculations for Destination Split and Modal Split. The reasons for omitting these MSOAs are explained in table 2-2.

**Table 2-2 – Reasons for omitting two MSOAs from the catchment areas**

MOSA	EXCLUDED FROM	REASON
K044	Group A	It is more logical for residents of this MOSA to use the A629 or Bradley Mill Road to travel directly to Huddersfield station or town centre by car or bus, rather than travelling to a Group A station.
B016	Group B	This MOSA is on the edge of the catchment area and the majority of the population in the MOSA is located outside the catchment area.

- 2.1.12 Eight key destinations were selected for analysing the destination split: Kirklees South, Kirklees North, Greater Manchester, South Yorkshire, Bradford, Calderdale, Leeds and Wakefield. It was assumed that these locations would account for the vast majority of trips as they contain the major employment centres within a one hour drive of the Penistone Line catchment areas.

- 2.1.13 Using the Nomis website, data from the 2011 UK Census was extracted showing the destination split and modal split for Groups A and B to these destinations.

## 2.2 COMMUTING PATTERNS DATA

- 2.2.1 This section shows the destination split and mode split for trips originating in the catchment area of the line.

- 2.2.2 The eight destinations selected accounted for 90% of all trips originating in the Penistone catchment area. The data presented in this section omits the trips to the 10% of other destinations because it was assumed that park and ride would not appeal to residents travelling to these areas because they were located much further away and any rail trips to them would involve two or more changes.

2.2.3 The car category includes car drivers, car passengers, motorbikes and taxis. The active modes category includes the 'Other' category for modes.

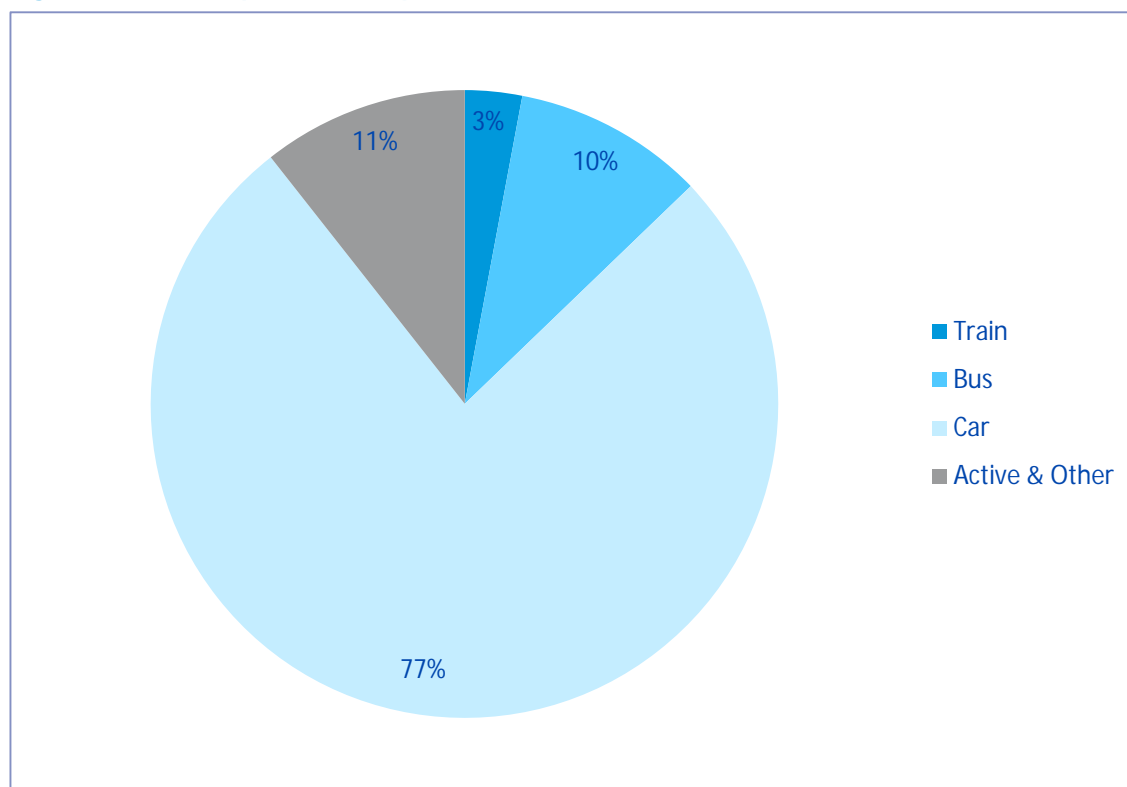
## GROUP A

2.2.4 The destination split and modal split for trips originating in Group A is shown in table 2-3 and figures 2-4 to 2-6.

**Table 2-3 – Destination and modal split for journeys to work commencing in Group A**

DESTINATION	TOTALS		TRAIN		BUS		CAR		ACTIVE INC OTHER	
	Split	Journeys	Journeys	%	Journeys	%	Journeys	%	Journeys	%
Kirklees North	4%	942	27	3%	54	6%	803	85%	58	6%
Kirklees South	70%	16057	149	1%	1915	12%	11712	73%	2281	14%
Greater Manchester	4%	845	84	10%	19	2%	729	86%	13	2%
South Yorkshire	3%	779	30	4%	7	1%	730	94%	12	2%
Bradford	3%	636	11	2%	46	7%	571	90%	8	1%
Calderdale	6%	1456	16	1%	157	11%	1264	87%	19	1%
Leeds	6%	1478	344	23%	36	2%	1076	73%	22	1%
Wakefield	3%	661	13	2%	17	3%	621	94%	10	2%
Totals	100%	22854	674	3%	2251	10%	17506	77%	2423	11%

**Figure 2-4 – Modal split from Group A to all destinations**



2.2.5 Modal split for trips from Group A to Kirklees South and Leeds are shown in figures 2-5 to 2-6.

Figure 2-5 – Modal split for residents of Group A who work in Kirklees South

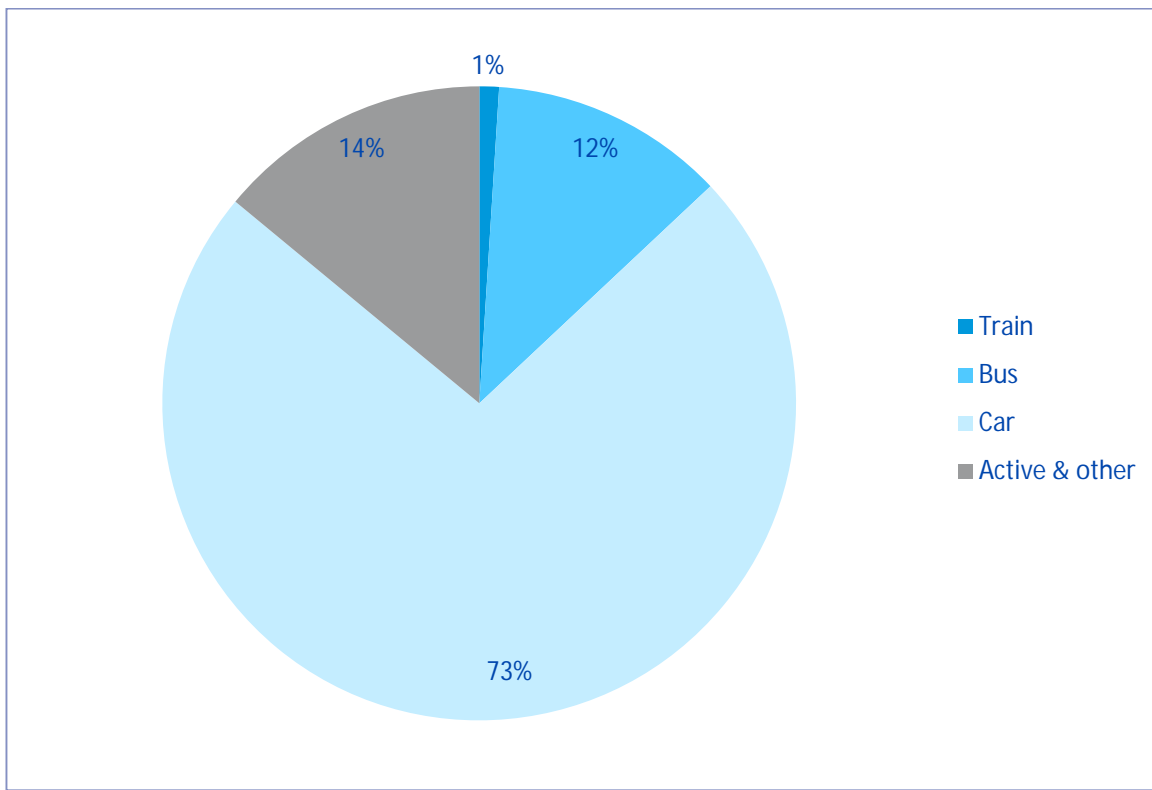
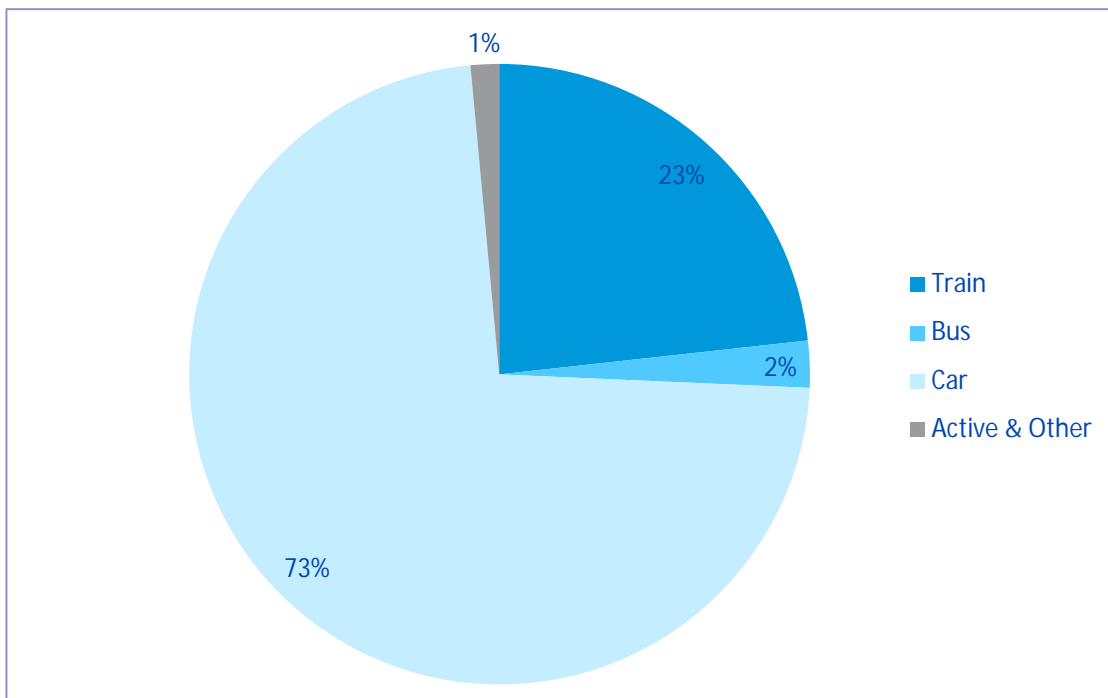


Figure 2-6 – Modal split for residents of Group A who work in Leeds



## GROUP B

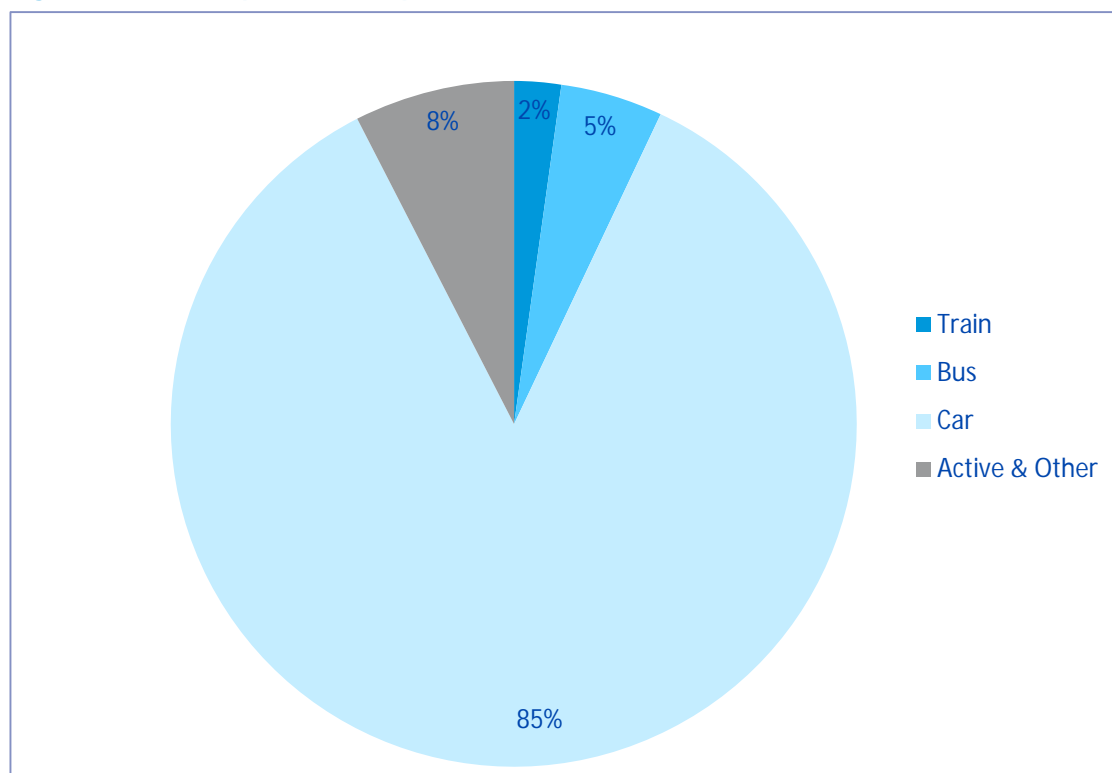
### 2.2.6

The destination split and modal split for trips from Group B is shown table 2-3 and figures 2-8 to 2-10.

**Table 2-4 – Destination and modal split for journeys to work commencing in Group B**

DESTINATION	TOTAL		TRAIN		BUS		CAR		ACTIVE & OTHER	
	Split	Journeys	Journeys	%	Journeys	%	Journeys	%	Journeys	%
Kirkees North	6%	631	8	1%	16	3%	580	92%	27	4%
Kirklees South	57%	6528	76	1%	429	7%	5241	80%	782	12%
Greater Manchester	2%	236	23	10%	9	4%	196	83%	8	3%
South Yorkshire	10%	1095	37	3%	14	1%	1029	94%	15	1%
Bradford	3%	311	3	1%	7	2%	300	96%	1	0%
Calderdale	4%	429	11	3%	16	4%	395	92%	7	2%
Leeds	10%	1152	87	8%	17	1%	1039	90%	9	1%
Wakefield	9%	1079	10	1%	44	4%	1010	94%	15	1%
<b>Total</b>	<b>100%</b>	<b>11461</b>	<b>255</b>	<b>1%</b>	<b>552</b>	<b>4%</b>	<b>9790</b>	<b>94%</b>	<b>864</b>	<b>1%</b>

**Figure 2-7 – Modal split from Group B to all destinations**



2.2.7 The modal split for trips from Group B to Kirklees South and Leeds are shown in the figures below.

**Figure 2-8 – Modal split for residents of Group B who work in Kirklees South**

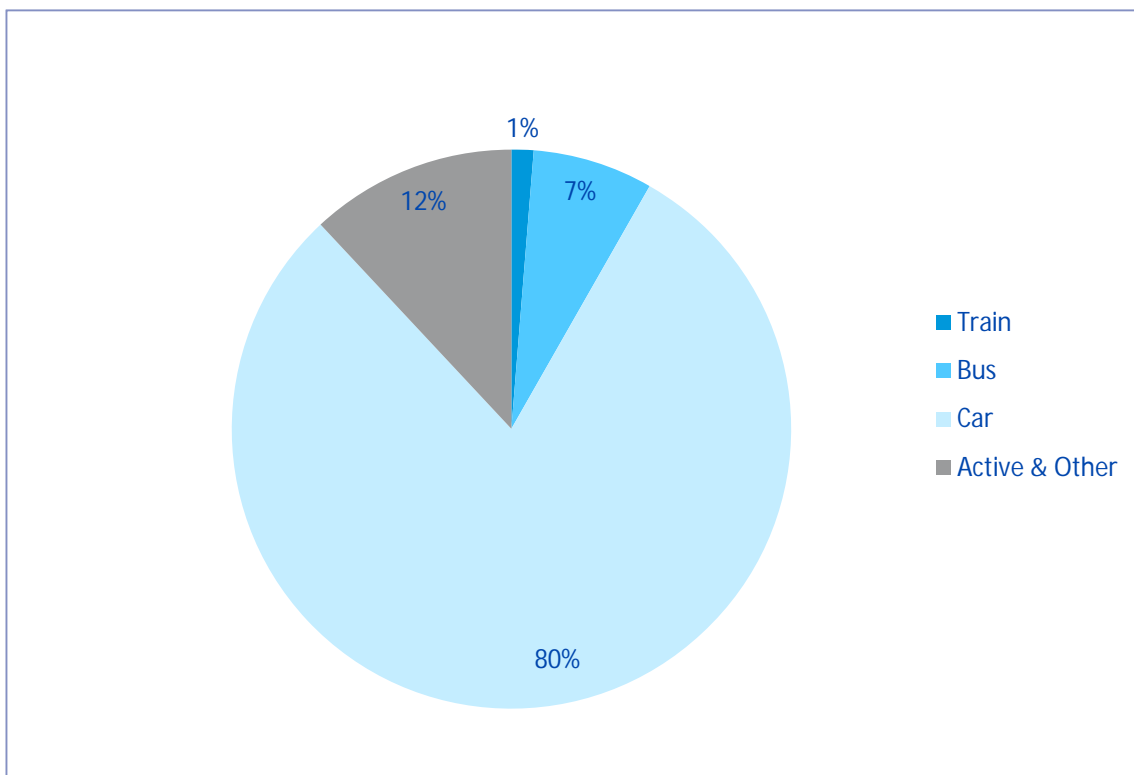
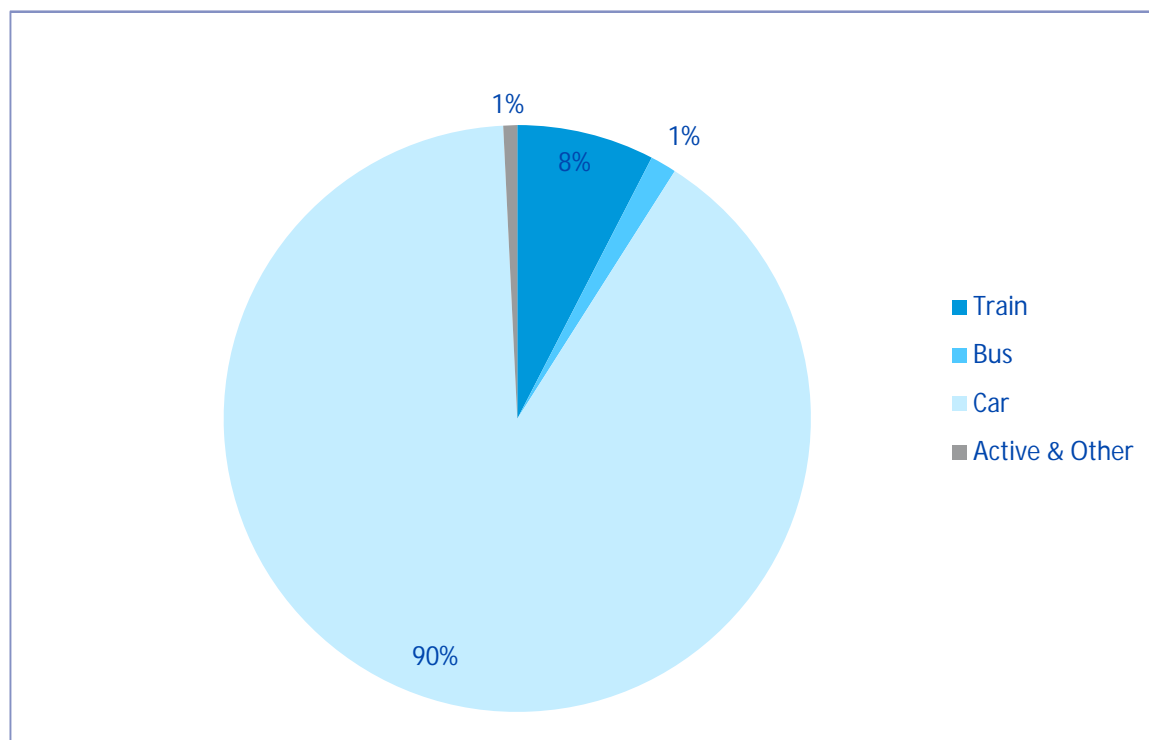




Figure 2-9 – Modal split for residents of Group B who work in Leeds



## 2.3 ANALYSIS OF COMMUTING PATTERNS

### GROUP A

- 2.3.1 Kirklees South is the destination for the vast majority of trips originating in Group A, accounting for 70% of trips. Calderdale and Leeds are the next most popular destinations for trips originating in Group A, accounting for 6% and 6% of trips respectively, which is substantially less than the proportion travelling to Kirklees South.
- 2.3.2 The car is the dominant mode for trips originating in Group A, accounting for 76% of trips overall and 69% of trips to Kirklees South. Rail currently accounts for a small minority of trips originating in Group A: 3% of trips overall and 1% of trips to Kirklees South.
- 2.3.3 Rail accounts for a comparatively large proportion of journeys to work from the Penistone Line catchment to Leeds: uniquely among the destinations considered, rail is the second most popular for trips to Leeds after the car accounting for 23% of trips.

### GROUP B

- 2.3.4 Kirklees South is the destination for the majority of trips originating in Group B, accounting for 57% of trips, but it is a less dominant attractor for trips originating in Group B than for trips originating in Group A. South Yorkshire, Wakefield and Leeds are the next most popular destinations for trips originating in Group B, accounting for 10%, 9% and 10% of trips respectively. Taken together the number travelling to these destinations is around half the number travelling to Kirklees South alone.
- 2.3.5 The car is the dominant mode for trips originating in Group B, accounting for 85% of trips overall and 80% of trips to Kirklees South. Rail currently accounts for a small minority of trips originating in Group B: 2% of trips overall and 1% of trips to Kirklees South.

2.3.6 Rail accounts for a comparatively large proportion of journeys to work from the Penistone Line catchment to Leeds: among the destinations considered, rail is the second most popular for trips to Leeds after the car accounting for 7.5% of trips.

## 2.4 CONCLUSION

2.4.1 Four linked conclusions about potential demand for park and rail on the Penistone Line can be drawn from the foregoing analysis:

1. Most trips which originate in the catchment area of the Penistone Line are car trips bound for Kirklees South. This is likely a consequence of the quantum of jobs in Kirklees South and the proximity of this area. These car trips are candidates for modal shift from car to park and ride for journeys ending in Kirklees South. Huddersfield town centre is the main employment area in Kirklees South and Huddersfield station can be reached by direct services from Penistone Line stations; therefore, it is assumed that park and ride would be most attractive to residents of the Penistone Line catchment area who work in Huddersfield town centre.
2. Although it accounts for a much smaller proportion of trips overall, Leeds is the most significant destination for rail trips from the Penistone Line catchment area. This is because it is the major employment centre in the Leeds city region. This suggests that park and ride might appeal to more residents of the catchment area who work in Leeds. Leeds city centre is the main employment area in Leeds and Leeds station is well-served from Huddersfield station where passengers from the Penistone Line station must change; therefore, it is assumed that park and ride would be attractive to residents of the Penistone Line catchment area who work in Leeds city centre.
3. If rail service levels improved and if additional car parking was provided at Penistone Line stations, many existing car trips could be intercepted at one of the Penistone Line stations for onward travel to Huddersfield and Leeds. Given the destination of these trips, it is likely that park and ride facilities would be most attractive if they were located at Group A stations, since users would be unlikely to drive for very far in the opposition direction from their ultimate destination to reach park and ride.
4. Finally, it should be noted that, since bus is currently the main public transport mode for residents of the Penistone Line catchment, many existing bus users may convert to rail (particularly for trips to Kirklees South) if the rail offer improved on the Penistone Line.

2.4.2 Consequently, the remainder of this study will consider the potential appeal of park and ride for journeys to work from the Penistone Line catchment to Huddersfield and Leeds.

# 3 RAIL INFRASTRUCTURE AND OPERATIONS

## 3.1 INTRODUCTION

3.1.1 This section considers the competitiveness of rail against other modes for journeys to work in key employment destinations in the North of England. By exploring infrastructural and operational opportunities and constraints, it then evaluates the likelihood that service levels on the Penistone Line could be enhanced.

## 3.2 COMPARISON OF RAIL AND ROAD JOURNEY TIMES

### METHODOLOGY AND RESULTS

3.2.1 In order to assess the potential for park and ride services to attract car users, it is necessary to measure the attractiveness of rail services on the Penistone Line in relation to car trips for similar journeys.

3.2.2 In the first instance, journey time data from Penistone Line stations to key employment areas in West Yorkshire was derived from National Rail Enquiries for rail trips and Google Maps for car trips. This is shown in table 3-1.

3.2.3 Using the Google Maps Journey Planner, car trip times were derived by selecting the Penistone Line station as the starting point and the key employment area as the end point. The arrival time was set for 9am on a Tuesday. The application calculates the normal range of car journey time based on standard traffic conditions (for example, 30 minutes to 45 minutes). The table below presents this range and shows the median journey time.

3.2.4 Using National Rail Enquiries, rail trip times were derived by selecting the Penistone Line station as the starting point and the key employment area as the end point. A mean journey time was calculated for services departing after 7am and arriving no later than 9am on a weekday. The journey time includes interchange time (but not an additional penalty for the inconvenience of changing).

**Table 3-1 – Rail and car journey times to key employment destinations**

GROUP	PENISTONE LINE STATIONS	JOURNEY TIME (MINUTES)					
		Huddersfield		Leeds		Sheffield	
		Rail	Car [median]	Rail	Car [median]	Rail	Car [median]
A	Lockwood	5	9-14 [11.5]	33	40-85 [62.5]	76	55-100 [72.5]
	Berry Brow	8	10-18 [14]	36	40-90 [65]	73	55-90 [72.5]
	Honley	11	14-24 [17]	39	45-85 [65]	70	50-90 [72.5]
	Brockholes	13	16-26 [21]	41	34-90 [62]	67	50-85 [67.5]
	A Average	9	16	37.3	64	72	71
B	Stocksmoor	17	18-28 [24]	45	40-75 [57.5]	63	45-85 [65]
	Shepley	20	20-30 [25]	48	40-75 [57.5]	61	40-80 [60]
	Denby Dale	25	24-40 [32]	53	35-65 [50]	55	45-75 [60]
	B Average	21	27	49	55	60	62

3.2.5 Given the conclusion of Section 2, this study proceeds by comparing rail and car journey times to Huddersfield and Leeds. It is judged that residents of the Penistone Line catchment area working in these destinations are most likely to use park and ride.

- 3.2.6 The values presented in the table above are crude journey times which do not take into account aspects of a rail journey. Consequently, a number of journey time penalties were added to the rail trip times from Penistone Line stations to Huddersfield. These are explained in table 3-2. The penalties used represent reasonable estimates and as such provide a useful tool for assessing the potential for rail park and ride growth in this area. Given the high level nature of this study, the DfT's WebTAG and the rail industry's PDFH have not been used.

**Table 3-2 – Journey time penalties for rail trips**

JOURNEY TIME PENALTY	APPLIED TO	EXPLANATION
5 minutes	Leeds and Huddersfield	The average additional driving time from home to a railway station within the catchment area in comparison to a direct driving route.
5 minutes	Leeds and Huddersfield	Given that rail services on the Penistone Line operate at a frequency of one train per hour, it is assumed that rail users would arrive at least 5 minutes before the scheduled departure time to reduce the risk of missing the service.
5 minutes	Leeds only	For services to Leeds, this penalty is applied to reflect the inconvenience of changing at Huddersfield station (the interchange time is reflected in the journey time).
5 minutes	Huddersfield only	Average walking time from the railway station to workplace.

- 3.2.7 The journey time penalties above do not take account of the inconvenience of planning a journey around a rail service with one train per hour. This is likely to add to the perceived journey time of rail users. It also significantly reduces their freedom for manoeuvre in planning rail journeys. By contrast, car users, who can commence their journey at a time of their choosing, enjoy significantly more flexibility.
- 3.2.8 While it is recognised that the car journey times are based on a journey type that is unlikely to take place (from station to station) it is assumed that this journey type is still a useful proxy for the car trips that are likely to take place. This is because car users who have slightly longer journeys will be balanced by those who have shorter journeys.
- 3.2.9 Journey time penalties were not added to the car journey times because car users begin their journey at home and they are likely to locate parking within close proximity to their workplace at the end point of the journey, given the availability of public and employee car parking in Huddersfield town centre. However, in Leeds commuter car parking is scarcer in relation to the size of the workforce and located mainly on the fringe of the city centre, so it is judged that car commuters are unlikely to find parking that is significantly closer to their workplace than the railway station in Leeds.
- 3.2.10 Tables 3-3 and 3-4 show how car and rail journey times compare when the time penalties explained above are applied to rail journey times.

**Table 3-3 – Comparison of car and rail trip times to Leeds with penalties applied**

STATION	TRIP TIME TO LEEDS (MINUTES)				
	Rail time	Total journey time penalty	Total rail time	Car time (median)	Car time advantage over rail (minutes)
Lockwood	33	15	48	62.5	-14.5
Berry Brow	36	15	51	65	-14
Honley	39	15	54	65	-11
Brockholes	41	15	56	62	-6
Group A Average	37.3	-	52	63.5	-11
Stocks Moor	45	15	60	57.5	-3.5
Shepley	48	15	63	57.5	5.5
Denby Dale	53	15	58	50	8
Group B Average	49	-	60	55	3

**Table 3-4 – Comparison of car and rail trip times to Huddersfield with penalties applied**

STATION	TRIP TIME TO HUDDERSFIELD (MINUTES)				
	Rail time	Total journey time penalty	Total rail time	Car time (median)	Car time advantage over rail (minutes)
Lockwood	5	15	20	11.5	8.5
Berry Brow	8	15	23	14	9
Honley	11	15	26	19	7
Brockholes	13	15	28	22	6
Group A Average	9	-	24	17	8
Stocks Moor	17	15	32	23	9
Shepley	20	15	35	25	10
Denby Dale	25	15	40	32	8
Group B Average	21	-	36	27	9

## ANALYSIS OF RAIL AND CAR JOURNEY TIMES

- 3.2.11 At the outset, it should be noted that these values do not take into account the significant advantages enjoyed by car trips in terms of flexibility it offers users to commence journey when they choose. For services on the Penistone Line, rail offers limited journey time flexibility to users due to the low service level of one train per hour. For this reason, these values are likely to underestimate the comparative advantage of rail over the car. It should also be noted that this analysis considers journey time only, rather than the comparative cost of different modes. This would require further study. Given the low quality of passenger facilities on the Penistone line (for instance the lack of WiFi and plug-in points) we have not factored in the value of working on the train.

### LEEDS

- 3.2.12 Even after the journey time penalties have been applied, rail trips continue to enjoy an advantage over car trips for journeys to Leeds commencing at Group A stations and Stocks Moor in Group B; this difference is fairly significant for journeys to Leeds from Lockwood, Berry Brow and Honley.

However, the car has a journey time advantage for journeys to Leeds beginning two out of three Group B stations.

- 3.2.13 It should be noted that for journeys from Penistone Line stations to Leeds, rail offers users significantly less journey planning flexibility due to the need to change services at Huddersfield.

### HUDDERSFIELD

- 3.2.14 Once the journey time penalties have been applied, car trips have a time advantage over rail trips for journeys to Huddersfield from every station on the line and for both groups. The journey time advantage is greatest for Shepley and lowest for Brockholes, but the range is relatively small.
- 3.2.15 There is not a significant difference between Group A and B in terms of the journey time advantage enjoyed by car users. It cannot be claimed, therefore, that rail is more competitive for stations in one particular group.

### CONCLUSION

- 3.2.16 Two conclusions can be drawn from this exercise:
1. Rail can compete with the car for journeys to Leeds from Group A stations and Stocksmoor, but not from most Group B stations. This indicates that, even in the absence of changes in rail service levels, park and ride may be attractive on the Penistone Line for journeys to Leeds from Group A stations. Improvements in service levels would be required to make rail competitive with the car for residents from most Group B stationworking in Leeds. However, as shown in Section 2, journeys to Leeds account for a small proportion of trips from the Penistone Line catchment so the market for park and ride to Leeds is likely to be small.
  2. Rail is not currently competitive with the car for journeys to Huddersfield. This suggests that, if there are no significant changes in rail service levels or car journey times, park and ride is less likely to be attractive on the Penistone Line for journeys to Huddersfield. Given that the car enjoys an advantage across the line and for stations in both groups, it is not possible to identify a particular station or group where park and ride would be likely to appeal to car users for journeys to Huddersfield. This is significant because, as shown in Section 2, Kirklees South is the main workplace destination for residents of the Penistone Line catchment, so journeys to Huddersfield is the key market that park and ride would seek to target.
- 3.2.17 This suggests that in order to cultivate a significant market for park and ride on the Penistone Line, improvements in rail service levels (frequency and journey time) are required.

## 3.3 POTENTIAL FOR IMPROVEMENT ON THE PENISTONE LINE

### INTRODUCTION

- 3.3.1 This section provides a high level assessment of the potential for increased rail services and rail passenger demand along the Penistone Line within West Yorkshire. It does so by investigating infrastructural and operational opportunities and constraints on the line.
- 3.3.2 While the scope of this study is confined to the Penistone Line stations in West Yorkshire, in order to understand the potential for improving services at these stations, it is necessary to widen the parameters of the study to include to entire Penistone Line between Huddersfield and Sheffield and adjacent railway lines in West and South Yorkshire.

## CURRENT INFRASTRUCTURE AND USAGE

- 3.3.3** The Penistone Line connects Huddersfield and Barnsley, and hosts 10 intermediate stations. The first 40 chains (½ mile) of the line start from Platform 2 at Huddersfield, and run through the south-east bore of the Huddersfield Tunnel, adjacent to the Up Main line of the Huddersfield to Manchester railway. After exiting the tunnel, Springwood Junction marks the beginning of the Penistone Line as a separate predominantly single-track railway to Barnsley. The line passes over 4 viaducts and through 6 tunnels before reaching Penistone.
- 3.3.4** The line is predominantly single-track, with the exception of two-track sections from Stocksmoor Junction to Clayton West Junction. The passenger linespeed never exceeds 50mph, and drops to 40mph or lower in several sections of the route. The loading gauge is W6 (that is, it is not suitable for any freight traffic wider or taller than passenger trains). The signalling system uses track circuit blocks to control 3-aspect signals, with control passing from Huddersfield Signal Box to Penistone Signal Box at PEH 8m 40ch. It is not electrified.
- 3.3.5** There are no current plans to enhance any of these attributes of the infrastructure, though it is expected that by the end of Network Rail's current planning horizon (2043), the line will have been upgraded to the European Rail Traffic Management System (ERTMS) with regards to train control and signalling.
- 3.3.6** Train services along the line are currently operated by Northern (the trading name of Arriva Rail North), who hold the local rail franchise until 31<sup>st</sup> March 2025. From Monday to Saturday, the line is currently served by 1 train per hour (in each direction) from Huddersfield to Sheffield and vice versa.
- 3.3.7** On weekdays, the first train leaves Huddersfield for Sheffield at 06:10, and the last at 22:18, with journey times varying from 1h 16m to 1h 23m. Meanwhile, the first train leaves Sheffield for Huddersfield at 05:36, and the last at 22:41, with journey times varying from 1h 13m to 1h 20m. On Sundays, the trains only operate between circa 9:15am and 9pm, with their frequency dropping to two-hourly at certain times. Between Sheffield and Barnsley, the trains call at Meadowhall, Chapeltown and Wombwell, and occasionally at Elsecar.
- 3.3.8** About a decade ago the open access operator Alliance Rail proposed operating a 4 trains per day London King's Cross to Huddersfield service, calling at Worksop, Sheffield, Barnsley and Penistone, but this is no longer on their current list of projects.
- 3.3.9** Some key aspects of the existing stations on the Penistone Line are shown in table 3-4. Please note that the stations from Huddersfield to Denby Dale are located in West Yorkshire (Kirklees) and the remainder are in South Yorkshire (Barnsley Metropolitan District).

**Table 3-5 – Railway stations on the Penistone Line**

STATION	LOCATION	TYPICAL WEEKDAY JOURNEY TIME (MINUTES) FROM		NUMBER OF TRACKS AT THE STATION	PASSENGER ENTRIES AND EXITS		PASSENGER GROWTH (2005/6 TO 2015/6)	CURRENT CAR PARKING SPACES
		Huddersfield	Sheffield		2005/6	2015/6		
Huddersfield	PEH 0m 00ch	0	73	4/5	2,386,280	5,041,600	111%	28
Lockwood	PEH 1m 18ch	3	68	1	22,746	51,284	125%	10
Berry Brow	PEH 2m 26ch	6	65	1	19,306	32,906	70%	0
Honley	PEH 3m 28ch	9	62	1	33,995	58,684	73%	0
Brockholes	PEH 4m 25ch	12	60	1	32,943	61,974	88%	0
Stocksmoor	PEH 6m 26ch	16	56	2	21,528	21,628	0%	6
Shepley	PEH 7m 14ch	18	53	2	42,793	72,266	69%	0



STATION	LOCATION	TYPICAL WEEKDAY JOURNEY TIME (MINUTES) FROM	NUMBER OF TRACKS AT THE STATION	PASSENGER ENTRIES AND EXITS	PASSENGER GROWTH (2005/6 TO 2015/6)	CURRENT CAR PARKING SPACES		
Denby Dale	PEH 9m 31ch	23	48	1	81,533	203,404	149%	10
Penistone	PEH 13m 36ch	30	41	2	108,745	162,852	50%	15
Silkstone Common	PED2 2m 21ch	36	35	1	26,005	39,488	52%	5
Dodworth	PED2 3m 60ch	40	31	1	25,633	47,944	87%	14
Barnsley Interchange	PED2 6m 54ch	47	24	2	867,801	1,482,876	71%	76

## ROLLING STOCK AND THE CURRENT FRANCHISE

- 3.3.10 The current timetable assumes that services along the Penistone Line are operated by Class 14X *Pacer* diesel multiple units (DMUs), with a maximum speed of 75mph. Meanwhile, the platform lengths at most stations on the route dictate that 2-car trains are used. Northern operate two models of train that fit this description, as shown in the table below.
- 3.3.11 However, as part of their current rolling stock upgrade programme (and in compliance with the Rail Vehicle Accessibility Regulations 2008), they are committed to phasing Class 14X vehicles out by 2020. By this time, Northern will have taken delivery of new *Civvy* rolling stock in order to run its new *Northern Connect* inter-urban services. This will allow the cascade of Class 150 *Sprinter* DMUs to the Penistone Line.
- 3.3.12 The *Sprinter* trains are generally accepted as being more comfortable than the *Pacer*, and it can be seen that they provide greater capacity as well. However, without some track and signalling upgrades in order to provide a *Sprinter* differential linespeed, this rolling stock change will not significantly reduce journey times.

**Table 3-6 – Northern’s Pacer and Sprinter fleet on the Penistone Line**

CLASS	NUMBER OPERATED	MAXIMUM SPEED (MPH)	CARS	SEATED CAPACITY	STANDING CAPACITY
142	79	75	2	106	46
144	13	75	2	128	49
150	58	75	2	139	60

- 3.3.13 It should be noted that about a decade ago, it was suggested that the Penistone Line could be used as the test site for the trialling of Tram Train vehicles in the UK. The superior acceleration and braking of such vehicles could have reduced journey times along the line without any change in maximum linespeed. However, the DfT decided to trial Tram Train technology between Sheffield and Rotherham instead.

## FUTURE POTENTIAL AND CONSTRAINTS

- 3.3.14 In order to gauge the potential for future expansion of rail demand on the Penistone Line, the usage of stations on that route has been compared with other stations in the same geographical area (i.e. Kirklees and Barnsley districts) but situated on different rail routes with different service levels and destinations.



- 3.3.15 The metric which has been used for comparison is the trip rate, which is a measure of how many journeys start at that railway station (“Entries” from the Office of Road and Rail’s annual passenger statistics) divided by that station’s catchment population. The population figure which has been used is a weighted population based on the Medium Super Output Areas (MSOAs) of the 2011 census which are closest to that station.
- 3.3.16 Any MSOAs within 800 metres of the station are counted at their full population, as people living within this distance are most likely to use rail services (with a mode share of 6.86% according to census data). The MSOAs between 800m and 2km are counted at a proportion of their population (53%) scaled down to reflect the lower rail mode share of 3.61% for these areas. Meanwhile, those MSOAs which are nearest to that station, but more than 2km away, are weighted with 22% of their total population; this reflects a rail mode share of 1.48% of journeys.
- 3.3.17 The weighted populations and trip rates (based on the 2011 census and 2015/16 ORR data) for every station in Kirklees and Barnsley are shown in Table 3-6 below:

**Table 3-7 – Rail trip rates in Kirklees and Barnsley**

STATION	WEIGHTED POPULATION (2011 CENSUS)	RAIL MODE SHARE (2011 CENSUS)	TOTAL ENTRIES (2015/16) (ORR FIGURES)	TRIP RATE
<b>Penistone Line Stations</b>				
Berry Brow	5,563	2.0%	16,453	3
Brockholes	5,201	1.6%	30,987	6
Denby Dale	4,625	1.1%	101,702	22
Dodworth	4,884	1.3%	23,972	5
Honley	3,110	1.9%	29,342	9
Lockwood	16,346	1.8%	25,642	2
Penistone	8,207	0.9%	81,426	10
Shepley	3,528	1.6%	36,133	10
Silkstone Common	2,339	1.1%	19,744	8
Stocksmoor	2,102	1.6%	10,814	5
<b>Other Stations in Kirklees and Barnsley Metropolitan Districts</b>				
Barnsley	25,556	1.1%	741,438	29
Batley	20,180	1.1%	165,439	8
Bolton-on-Dearne	5,926	1.3%	37,598	6
Darton	8,423	1.3%	109,095	13
Deighton	10,443	1.5%	47,824	5
Dewsbury	16,994	1.8%	848,454	50
Elsecar	9,290	1.5%	83,814	9
Goldthorpe	4,211	1.5%	31,255	7
Huddersfield	19,476	2.5%	2,520,800	129
Marsden	2,959	6.2%	90,447	31
Mirfield	9,890	1.9%	239,335	24
Ravensthorpe	8,978	1.4%	18,481	2
Slaithwaite	7,982	2.4%	106,304	13
Thurnscoe	5,780	1.1%	38,764	7
Wombwell	10,016	1.2%	112,193	11

- 3.3.18 Comparing the stations on the Penistone Line to those stations which are served by relatively frequent inter-regional trains (such as Huddersfield and Dewsbury) would not be a valid exercise.

- 3.3.19 However, it can be seen that trip rates on most Penistone Line stations are lower than some minor stations in the same general area which benefit from different service frequencies and destinations. With the exception of Denby Dale, all Penistone Line stations have a trip rate of 10 or lower; in some cases (Berry Brow, Dodworth, Lockwood and Stocks Moor) it is 5 or below. This contrasts with significantly higher trip rates at some local minor stations, such as Marsden (31), Mirfield (24) and Slaithwaite (13).
- 3.3.20 It could be suggested that higher frequency of services could explain the relatively high patronage of Mirfield. This station is served by hourly Wakefield to Huddersfield, Leeds to Huddersfield and Leeds to Manchester Victoria (via Hebden Bridge) services in each direction, giving 2 tph to Leeds and Huddersfield and 1 tph to Manchester and Wakefield; it is also served by less frequent Grand Central Bradford Interchange to London King's Cross services.

## POTENTIAL IMPROVEMENTS AND CONSTRAINTS

- 3.3.21 In light of the popularity of services on these other West Yorkshire stations, it might be argued that if service frequencies were increased to 2 tph on the Penistone Line, the attractiveness of rail travel could be transformed, and that this might necessitate improved facilities (such as better parking at the stations). At first sight it seems possible to accommodate this on the current infrastructure. At the moment, Penistone Line services travelling in opposite directions pass each other on two-track sections near Shepley and Barnsley.
- 3.3.22 If service frequencies were doubled, trains would also need to pass near Penistone (where there is a short two-track section) and Huddersfield (where use of Platform 2 alone would not permit this). It would thus be necessary to make some improvements in linespeed in order allow the twin-track section near Penistone to be used flexibly and permit a rapid turnaround of services at Huddersfield.
- 3.3.23 Furthermore, if the current Sheffield to Huddersfield service were duplicated, this would add additional traffic to the route between Barnsley and Sheffield and the already congested north throat at Sheffield Station; it may thus not be practical to insert an additional service in to the timetable without some corresponding infrastructure upgrade.
- 3.3.24 Moreover, it could be argued that higher trip rates are observed at some stations (i.e. Marsden and Slaithwaite) which are only served by 1 tph in each direction, and that the underlying factor determining trip rates is thus not the frequency of service but the attractiveness of the destinations directly served. Both of these stations benefit from direct services to Manchester Victoria, which is located close to an area of high gross value added employment (i.e. well-paid jobs in producer services) which generates rail commuter demand. Mirfield similarly has direct services to Leeds and Manchester Victoria, with Leeds Station also being located close to a prosperous business district. Meanwhile Darton Station provides an hourly direct service to Leeds, and has a trip rate of 13.
- 3.3.25 A more promising suggestion for transforming rail demand along the Penistone Line might thus be to investigate the possibility of extending the current Leeds to Huddersfield local service to Penistone as part of a future timetable revision, thereby creating a direct link to Leeds and its employment, retail and leisure opportunities. However, this proposal would be incompatible with some other planned changes to rail services along this route, namely:
- It would create additional conflicting moves and occupation of platform space along the main TransPennine Express Leeds to Manchester route; this route is expected to enjoy increased service frequencies as a result of the Trans-Pennine Route Upgrade (TRU) programme, and providing a new service that would generate conflicting moves may be incompatible with this.
  - The TRU programme will electrify the Leeds to Huddersfield route and thus allow the local service to be operated by electric multiple units (EMUs) with reduced operating costs. These trains would of course not be able to continue along the non-electrified Penistone Line.

## CONCLUSION

- 3.3.26 It can thus be seen that either of the service improvements that conceivably *could* lead to a transformation of rail demand along the Penistone Line are unlikely to be practical due to operational constraints; in particular, doubling the existing service frequency or providing a new direct service to Leeds are not necessarily compatible with existing plans to increase the frequency of inter-regional services using congested areas such as Huddersfield Station or Sheffield north throat.
- 3.3.27 Due to these constraints, it can therefore be concluded that the potential for a transformational change in usage of the Penistone Line is limited. Any enhancements to facilities are more likely to be justified as a response to existing trends rather than due to change brought about by radical service improvements.

## 3.4 COMMITTED AND PLANNED IMPROVEMENTS

- 3.4.1 This section reviews the proposed and planned improvements on the Penistone Line.
- 3.4.2 As part of the current Northern franchise, the operator (Northern, the trading name of Arriva Rail North) has committed to increasing levels of service on the line on Sundays from eight trains per day to 11 trains per day.
- 3.4.3 The West Yorkshire Combined Authority's Rail Plan 7, which covers the period up to 2026, explains plans for enhancing rail provision. This Plan contains no committed interventions on the Penistone Line, but it contains one planned measure:
- Infrastructure or selective door opening to allow longer trains.
- 3.4.4 The Plan also contains four measures earmarked for future development:
- Delivering customer information screens at all stations;
  - Refurbishing the waiting facilities at Honley;
  - More frequent services on the line; and
  - Increasing parking capacity and formalising street parking at stations.
- 3.4.5 These committed and planned improvements are likely to lead to only modest increases in patronage on the line. The committed increases in service levels are minor and they are unlikely to significantly increase the appeal of the line for non-users. The proposal to provide of improved customer facilities at stations is unlikely to drive large increases in usage. As explained in 3.2, the aspiration to increase service frequencies on the line more frequently are unlikely to be achieved within the period of the Rail Plan.

## 3.5 CONCLUSION

- 3.5.1 Three linked conclusions can be drawn from this overview of journey times and rail infrastructure and operations on the Penistone Line:
1. Currently, rail journey times are not competitive with car journey times from the settlements served by the Penistone Line in West Yorkshire for residents working in Huddersfield. This renders it difficult to attract current car users to rail services on the Penistone Line.
  2. Rail is competitive for journeys from Group A stations to Leeds, but journeys to Leeds account for a small proportion of journeys to work from Penistone Line stations, so it is

unlikely that investment in park and ride would be justified to target commuters from Group A stations to Leeds alone.

3. The potential for transformational change in usage of the Penistone Line, which is necessary to render park and ride a viable proposition for most residents of the Penistone Line catchment area, is limited by a set of infrastructural and operational constraints which are unlikely to be overcome in the next decade.

3.5.2 The conclusions of this section do not indicate that park and ride is likely to succeed on the Penistone Line.

# 4 LAND EVALUATION

## 4.1 BRIEF OVERVIEW

4.1.1 This section provides a high level assessment of the extent to which expanding car parking capacity at each of the Penistone stations would represent value for money. It considers the opportunities and constraints surrounding possible sites for car parking provision in the vicinity of Penistone Line stations.

4.1.2 At each station at least one possible site is evaluated by considering the following issues:

- Environmental issues,
- Demolitions and structures,
- Topography,
- Highway and pedestrian access,
- Land ownership, and
- Other, site specific constraints.

4.1.3 Each site is awarded a Red/Amber/Green (RAG) rating for value for money, which is explained in table 4-1.

**Table 4-1 – RAG Rating System for assessing value for money of sites**

RAG RATING	EXPLANATION
Red	This site is unlikely to offer good value for money because the constraints will be costly to overcome.
Orange	This site may offer good value for money if particular constraints can be overcome efficiently.
Green	This site is likely to offer good value for money because there are few constraints.

4.1.4 By assessing the merits of developing each site alongside the likely future demand for additional car parking spaces at each station, a high level judgement is reached on whether investment in additional station car parking is likely to represent good value for money.

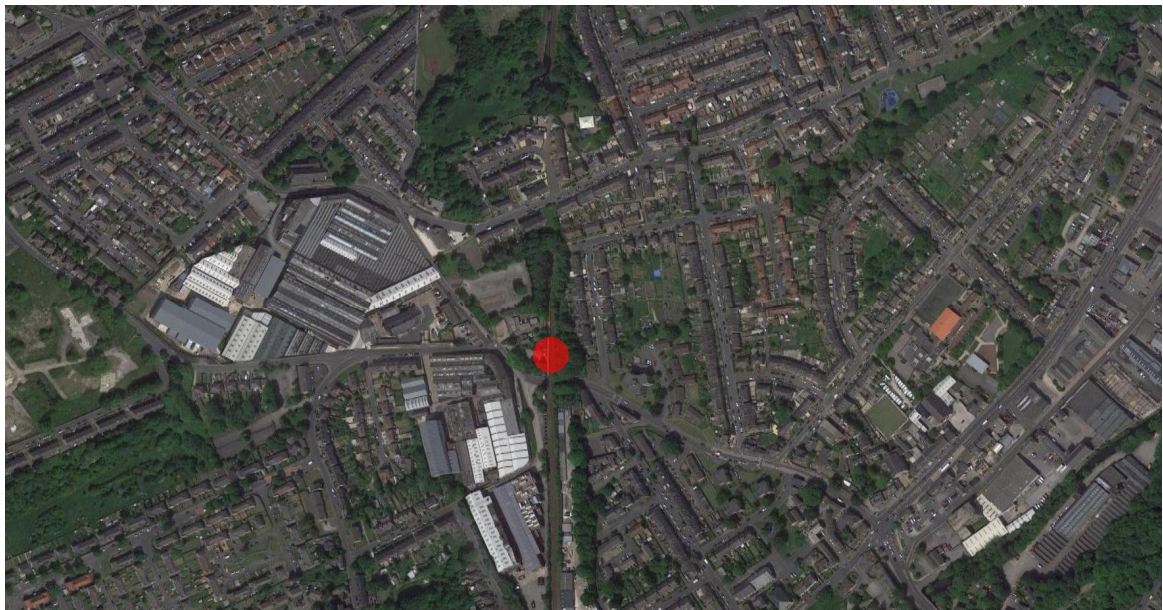
4.1.5 It should be emphasised that this is a high level assessment and more detailed feasibility work would be needed to validate these judgements.

## 4.2 LOCKWOOD STATION

### STATION LOCATION

4.2.1 Lockwood Rail Station (shown in red in Figure 4-1) is situated 1.17 miles south west of Huddersfield town centre on the Penistone Railway Line. Primarily serving the settlement of Lockwood, the station also serves the surrounding areas of Crosland Moor and Thornton Lodge.

Figure 4-1 – Lockwood station location



## STATION FACILITIES

- 4.2.2 The station has one platform, which is accessible via a ramp (which provides step-free access).
- 4.2.3 In 2015/16, it was estimated that Lockwood station handled approximately 51,284<sup>1</sup> passenger journeys (entries and exits). There were an estimated 49,940 entries and exits in 2014/15 (a 2.7% increase between 2014/15 and 2015/16). This was a significant increase on the figure of 22,746 in 2005/06, which constitutes a 125% increase in station usage between 2005/06 and 2015/16.
- 4.2.4 The existing station facilities at the time of this report are summarised in table 4-2.

Table 4-2 – Lockwood Station Facilities

FACILITIES	DESCRIPTION
Customer service/ticketing facilities	No ticket office or ticket machine at this station
Waiting facilities	1 x shelter 1 x bench
Number of standard parking bays	13 Standard Parking Bays
Number of disabled parking bays	1 Disabled Parking Bay
Number of cycle parking bays	10 x Cycle Stands
Charging regime for parking	There is currently no charging regime in operation at Lockwood station
Level of lighting	3 x lighting columns on the platform
Existence of security	No CCTV coverage at this station
Integration with other modes	1 x bus stop located on Park Road heading towards Almondbury and

<sup>1</sup> ORR Station Usage Data



FACILITIES	DESCRIPTION
	Beaumont Park (located 54m from the station car park entrance) 2 x bus stops located on Yew Green Road (1 x towards Beaumont Park, 77m from station car park entrance, and 1 x towards Huddersfield town centre, located 112m from the station car park entrance)

4.2.5 In order to gain a basic understanding of how increased supply or the increased availability of parking spaces may impact on demand, the Passenger Demand Forecasting Handbook (PDFH) has been used.

4.2.6 Appendix A of this document explains the process used to calculate what increase in demand providing extra car parking provision could deliver at Lockwood.

$$\frac{0.95 \times 11,344}{261} \times \left( \frac{(5+35)-5}{5+35} \right)^{-0.9} - \frac{0.95 \times 11,344}{261} = 5$$

4.2.7 The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 5 passengers per day. It can be assumed that each of these passengers will require one parking space. It should be noted that since this methodology does not take into account the proposed development in the vicinity of the station, this forecast is likely to under-estimate future demand for station parking.







## **BERRY BROW STATION**

### **STATION LOCATION**

Berry Brow Rail Station (shown in red in Figure 4-4) is situated 1.95 miles south west of Huddersfield town centre on the Penistone Railway Line. This rail station serves the surrounding suburbs of Netherton, Newsome and Armitage Bridge.

Figure 4-4 – Berry Brow station location



## STATION FACILITIES

- 4.3.2 The station has one platform, which is accessible via a fairly steep ramp (providing step-free access).
- 4.3.3 Approximately 32,9062 passengers used the station in 2015/16. This represented a slight incline from 2014/15 when 31,056 entries and exits from the station were recorded. This is a 6% increase between 2014/15 and 2015/16. Station usage at Berry Brow has increased significantly over the last decade: in 2005/06, 19,306 entries and exits were recorded. This is a 70% increase between 2014/15 and 2015/16.
- 4.3.4 The existing station facilities at the time of this report are summarised in table 4-3.

Table 4-3 – Berry Brow Station Facilities

FACILITIES	DESCRIPTION
Customer service/ticketing facilities	No ticket office or ticket machine at this station
Waiting facilities	No shelter 1 x bench
Number of standard parking bays	N/A
Number of disabled parking bays	N/A
Number of cycle parking bays	N/A

<sup>2</sup> ORR Station Usage Data, Multiple Years

FACILITIES	DESCRIPTION
Charging regime for parking	N/A
Level of lighting	3 x lighting columns on the platform
Existence of security	No CCTV coverage at this station
Integration with other modes	1 x bus stop located on Birch Road heading towards Huddersfield town centre (located 43m from the platform entrance) 1 x bus stop located on Farehill Road heading towards Huddersfield town centre and Newsome (located 51m from the platform entrance)

4.3.5 In order to gain a basic understanding of how increased supply or the increased availability of parking spaces may impact on demand, the Passenger Demand Forecasting Handbook (PDFH) has been used.

4.3.6 Appendix A of this document explains the process used to calculate what increase in demand providing extra car parking provision could deliver at Berry Brow.

$$\frac{0.95 \times 4,641}{261} \times \left( \frac{(8+35)-5}{8+35} \right)^{-0.9} - \frac{0.95 \times 4,641}{261} = 2$$

4.3.7 The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 2 passengers per day. It can be assumed that each of these passengers will require one parking space. It should be noted that since this methodology does not take into account the proposed development in the vicinity of the station, this forecast is likely to under-estimate future demand for station parking.





4.4.4 The existing station facilities at the time of this report are summarised in table 4-4.

**Table 4-4 – Honley Station Facilities**

FACILITIES	DESCRIPTION
Customer service/ticketing facilities	No ticket office or ticket machine at this station
Waiting facilities	1 x shelter 2 x bench
Number of standard parking bays	N/A
Number of disabled parking bays	N/A
Number of cycle parking bays	N/A
Charging regime for parking	N/A
Level of lighting	3 x lighting columns on the platform
Existence of security	No CCTV coverage at this station
Integration with other modes	1 x bus stop located on Station Approach, adjacent to the station, heading towards Meltham and Farnley Tyas (located 43m from the platform entrance)

4.4.5 In order to gain a basic understanding of how increased supply or the increased availability of parking spaces may impact on demand, the Passenger Demand Forecasting Handbook (PDFH) has been used.

4.4.6 Appendix A of this document explains the process used to calculate what increase in demand providing extra car parking provision could deliver at Honley.

$$\frac{0.95 \times 11,269}{261} \times \left( \frac{(11+35)-5}{11+35} \right)^{-0.9} - \frac{0.95 \times 11,269}{261} = 5$$

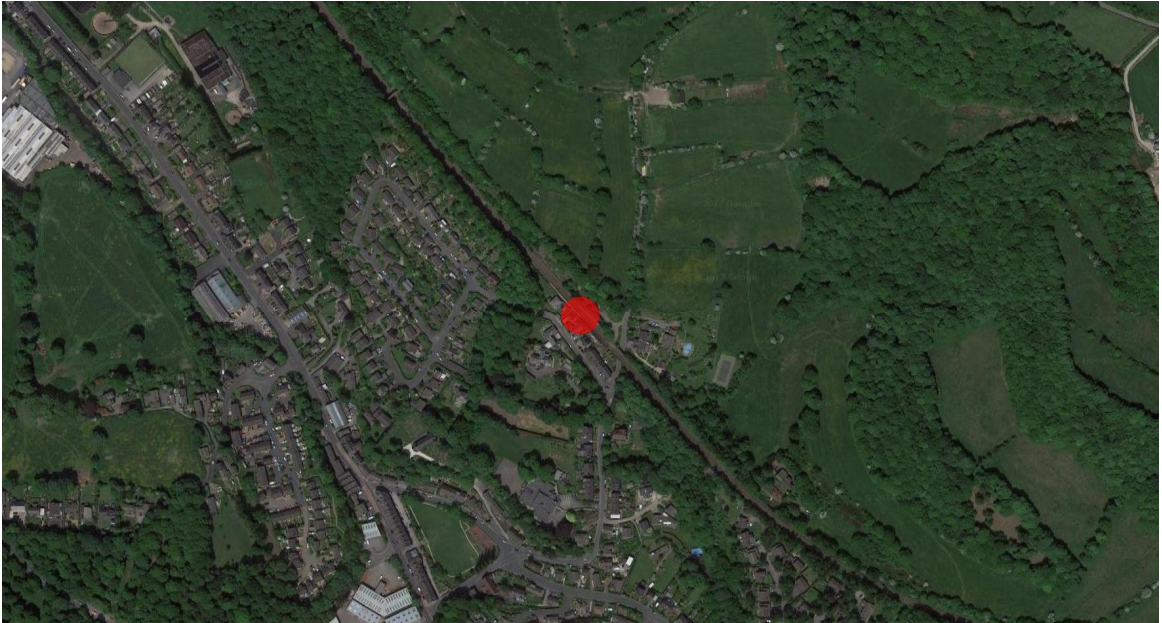
4.4.7 The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 5 passengers per day. It can be assumed that each of these passengers will require one parking space. It should be noted that since this methodology does not take into account the proposed development in the vicinity of the station, this forecast is likely to under-estimate future demand for station parking.







## 4.5 BROCKHOLES STATION



### STATION FACILITIES

- 4.5.2 Brockholes Station currently functions as a one platform station; step-free access available.
- 4.5.3 Brockholes Station handled approximately 61,9744 passenger journeys (entries and exits) in 2015/16 which was an increase of 32,943 passengers on the figure 2005/06 – growth of 88% in ten years.
- 4.5.4 The existing station facilities are summarised in table 4-5.

**Table 4-5 – Brockholes Station Facilities**

FACILITIES	DESCRIPTION
Customer service/ticketing facilities	No ticket office or ticket machine at this station
Waiting facilities	1 x shelter 1 x bench
Number of standard parking bays	N/A
Number of disabled parking bays	N/A
Number of cycle parking bays	N/A
Charging regime for parking	N/A
Level of lighting	3 x lighting columns on the platform

<sup>4</sup> ORR Station Usage Data, Multiple years

FACILITIES	DESCRIPTION
Existence of security	No CCTV coverage at this station
Integration with other modes	Closest bus stop located 380m away from the station on Oakes Lane. Bus towards Holmfirth and Meltham .

- 4.5.5 In order to gain a basic understanding of how increased supply or the increased availability of parking spaces may impact on demand, the Passenger Demand Forecasting Handbook (PDFH) has been used.
- 4.5.6 Appendix A of this document explains the process used to calculate what increase in demand providing extra car parking provision could deliver at Brockholes.

$$\frac{0.95 \times 8,178}{261} \times \left( \frac{(13+35)-5}{13+35} \right)^{-0.9} - \frac{0.95 \times 8,178}{261} = 3$$

- 4.5.7 The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 3 passengers per day. It can be assumed that each of these passengers will require one parking space. It should be noted that since this methodology does not take into account the proposed development in the vicinity of the station, this forecast is likely to under-estimate future demand for station parking.

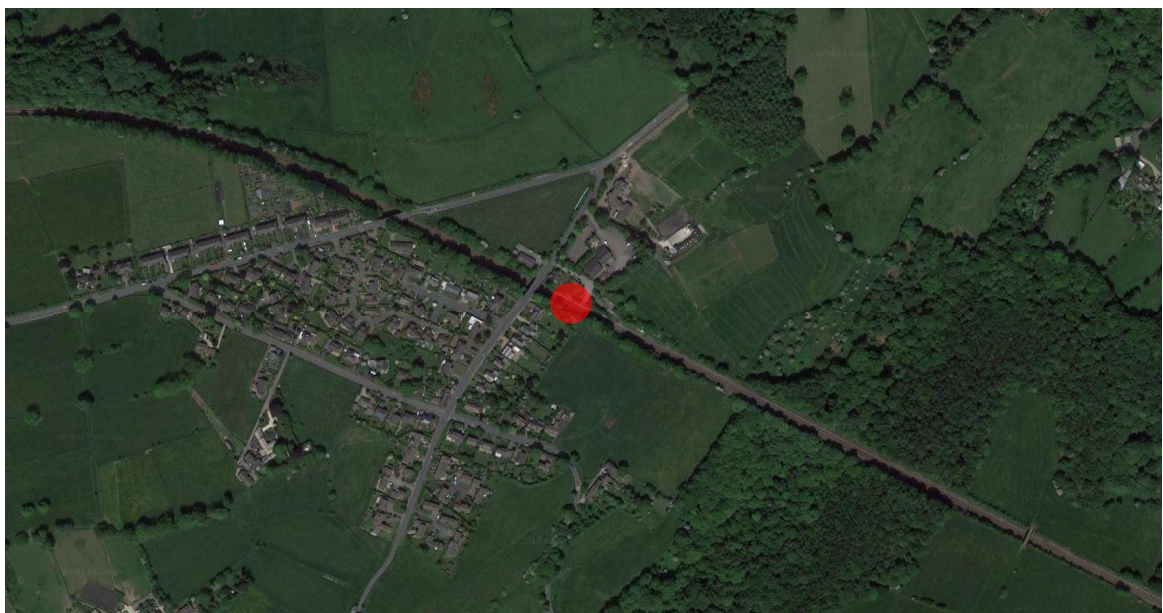


## 4.6 STOCKSMOOR STATION

### STATION LOCATION

- 4.6.1 Stocksmoor Rail Station (shown in red in figure 4-10) is situated 4.53 miles south east of Huddersfield town centre on the Penistone Railway Line. Stocksmoor station primarily serves the Town of Stocksmoor, its location put it's it prime reach of some suburban areas, such as Thunder Bridge and Fulstone.

Figure 4-10 – Stocksmoor station location



- 4.6.2 Operated by Northern, Stocksmoor station functions as a two platform station (step free access). Platform 1 is for services to Sheffield, where Platform 2 is for services to Huddersfield.
- 4.6.3 In 2015/16<sup>5</sup> Stocksmoor station handled approximately 21,628 passenger journeys, a decrease of 1,748 passengers on 2014/15. This is a 7% decrease between 2014/15 and 2015/16. Peak usage of Stocksmoor station occurred in 2010/11 where 27,194 passengers used the station. In 2005/06, 21,528 passenger journeys were made. Between 2015/16 and 2005/06, there has been a percentage increase of only 0.46%.

<sup>5</sup> ORR Station Usage Data, Multiple Years

4.6.4 The station car park is located to the adjacent to platform 1, which contains five standard spaces with one accessible space.

4.6.5 The existing station facilities are summarised in table 4-6.

**Table 4-6 – Stocksmoor Station Facilities**

FACILITIES	DESCRIPTION
Customer service/ticketing facilities	No ticket office or ticket machine at this station
Waiting facilities	1 x seating bench on each platform Shelter provided on both platforms
Number of standard parking bays	5 Standard Parking Bays
Number of disabled parking bays	1 Disabled Parking Bays
Number of cycle parking bays	3 x storage spaces
Charging regime for parking	There is currently no charging regime in operation at Stocksmoor
Level of lighting	2 x lighting columns on both platforms
Existence of security	No CCTV coverage at this station
Integration with other modes	1 x bus stop located on Station Road just before the Clothiers Arms entrance (1 x towards Huddersfield town centre, 229m from the platform 2 entrance)

4.6.6 In order to gain a basic understanding of how increased supply or the increased availability of parking spaces may impact on demand, the Passenger Demand Forecasting Handbook (PDFH) has been used.

4.6.7 Appendix A of this document explains the process used to calculate what increase in demand providing extra car parking provision could deliver at Stocksmoor.

$$\frac{0.95 \times 1,877}{261} \times \left( \frac{(17+35)-5}{17+35} \right)^{-0.9} - \frac{0.95 \times 1,877}{261} = 1$$

- 4.6.8 The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 3 passengers per day. It can be assumed that each of these passengers will require one parking space. It should be noted that since this methodology does not take into account the proposed development in the vicinity of the station, this forecast is likely to under-estimate future demand for station parking.



## SHEPLEY STATION

### STATION LOCATION

#### 4.7

Shepley Rail Station (shown in red in figure 4-12) is situated 5.36 miles south east of Huddersfield town centre on the Penistone Railway Line. Shepley station only serves the village of Shepley, as well as the suburban areas of Shelly and Kirkburton.

Figure 4-12 – Shepley station location

#### 4.7.1





## STATION FACILITIES

- 4.7.2 Shepley Rail Station functions as a two platform station. Platform 1 is for services to Sheffield, where platform 2 is for services to Huddersfield.
- 4.7.3 In 2015/16 Shepley station handled 72,622 passenger journeys, a decrease of 1,094 passengers of 1.4% on 2014/15<sup>6</sup>. In 2005/06, 42,793 passenger journeys were made. This means station usage increased by 70% during this ten year period.
- 4.7.4 The existing station facilities are summarised in table 4-7.

**Table 4-7 – Shepley Station Facilities**

FACILITIES	DESCRIPTION
Customer service/ticketing facilities	No ticket office or ticket machine at this station
Waiting facilities	Shelter provided on each platform 1 x bench on platform 2
Number of standard parking bays	N/A
Number of disabled parking bays	N/A
Number of cycle parking bays	10 X storage spaces
Charging regime for parking	N/A
Level of lighting	Both platforms and route between platforms well lit
Existence of security	No CCTV coverage at this station
Integration with other modes	2 x bus stops located on Abbey Road, adjacent to The Cask & Spindle (1 x towards Denby Dale, 349m from the platform entrance and 1 x towards Huddersfield, 346m from the platform entrance)

- 4.7.5 In order to gain a basic understanding of how increased supply or the increased availability of parking spaces may impact on demand, the Passenger Demand Forecasting Handbook (PDFH) has been used.
- 4.7.6 Appendix A of this document explains the process used to calculate what increase in demand providing extra car parking provision could deliver at Shepley.

$$\frac{0.95 \times 9,453}{261} \times \left( \frac{(20+35)-5}{20+35} \right)^{-0.9} - \frac{0.95 \times 9,453}{261} = 3$$

<sup>6</sup> ORR Station Usage Data, Multiple Years

#### 4.7.7

The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 3 passengers per day. It can be assumed that each of these passengers will require one parking space. It should be noted that since this methodology does not take into account the proposed development in the vicinity of the station, this forecast is likely to under-estimate future demand for station parking.





## 4.8 DENBY DALE STATION

### 4.8.1 STATION LOCATION

Denby Dale Rail Station (shown in red in figure 4-15) is situated 7.26 miles south east of Huddersfield town centre on the Penistone Railway Line. Denby Dale station only serves the village of Denby Dale as there are no surrounding settlements of a significant size.



## STATION FACILITIES

- 4.8.2 Denby Dale Station functions as a one platform station (not step free due to a high kerb).
- 4.8.3 Denby Dale Station handled approximately 203,404 passenger journeys (entries and exits) in 2015/16<sup>7</sup> which was an increase of 121,871 from 2005/06 (149%).
- 4.8.4 The existing station facilities are summarised in table 4-8.

**Table 4-8 – Denby Dale Station Facilities**

FACILITIES	DESCRIPTION
Customer service/ticketing facilities	No ticket office or ticket machine at this station
Waiting facilities	1 x shelter 2 x bench
Number of standard parking bays	8 Standard Parking Bays
Number of disabled parking bays	1 Disabled Parking Bay
Number of cycle parking bays	10 x storage spaces
Charging regime for parking	There is currently no charging regime in operation at Denby Dale station
Level of lighting	2 x lighting columns located on the platform
Existence of security	No CCTV coverage at this station
Integration with other modes	1 x bus stop located on Bromley Bank, outside the station entrance (1 x towards Huddersfield town centre, 82m from the platform entrance)

- 4.8.5 In order to gain a basic understanding of how increased supply or the increased availability of parking spaces may impact on demand, the Passenger Demand Forecasting Handbook (PDFH) has been used.
- 4.8.6 Appendix A of this document explains the process used to calculate what increase in demand providing extra car parking provision could deliver at Denby Dale.

$$\frac{0.95 \times 30,204}{261} \times \left( \frac{(25+35)-5}{25+35} \right)^{-0.9} - \frac{0.95 \times 30,204}{261} = 9$$

<sup>7</sup> ORR Station Usage Data

- 4.8.7 The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 9 passengers per day. It can be assumed that each of these passengers will require one parking space. It should be noted that since this methodology does not take into account the proposed development in the vicinity of the station, this forecast is likely to under-estimate future demand for station parking.







## 4.9 SUMMARY

- 4.9.1 Table 4-18 summarises the RAG ratings for each option and the high level value for money (VfM) assessments for investing in car parking capacity at each station.

STATION	RAG RATING FOR OPTIONS		HIGH LEVEL VFM JUDGEMENT FOR STATION
	first option	second option	
Lockwood	Red	Orange	Weak
Berry Brow	Orange	-	Weak
Honley	Orange	-	Moderate
Brockholes	Orange	-	Weak
Stocksmoor	Green	-	Weak
Shepley	Orange	Orange	Weak
Denby Dale	Orange	Green	Moderate

## 4.10 CONCLUSION

4.10.1 Two conclusions can be drawn from this evaluation of car park site options and the likely demand for these facilities:

1. Investment in increasing station parking capacity is unlikely to represent good value for money at any of the Penistone Line stations.
2. Honley and Denby Dale may represent moderate value for money but further investigation would be needed to confirm this.

# 5 LOCAL DEVELOPMENTS

## 5.1 INTRODUCTION AND METHODOLOGY

- 5.1.1 This section investigates the extent to which future development in the vicinity of the Penistone Line stations may increase the demand for park and ride services on the line.
- 5.1.2 To analyse the effect of future development, the residential site allocations in the Draft Local Plan of Kirklees Council within a 1.5km radius of each Penistone station were plotted. A 1.5km radius covers a smaller area than the 5km driving catchment area, but for this reason the 1.5km radius offers a more robust indication of the future development that is likely to influence demand for park and ride at Penistone Line stations. The likely effect of future development sites further away was judged to be marginal.
- 5.1.3 These sites were included in publication draft site allocation documents, but the GIS data files were supplied by the districts via WYCA. Sites that have been rejected from the Draft Local Plan since these shapefiles were created were removed using information published by Kirklees Council. These plots are shown in Section 5.2.
- 5.1.4 It is important to note that, with the exception of Wakefield, the Local Plans for the West Yorkshire districts are not yet complete. The site allocations are subject to change during the forthcoming stages of the Local Plan process. This means that no firm conclusions can be drawn about future growth from these sites.

## 5.2 FUTURE DEVELOPMENT IN THE VICINITY OF THE STATIONS

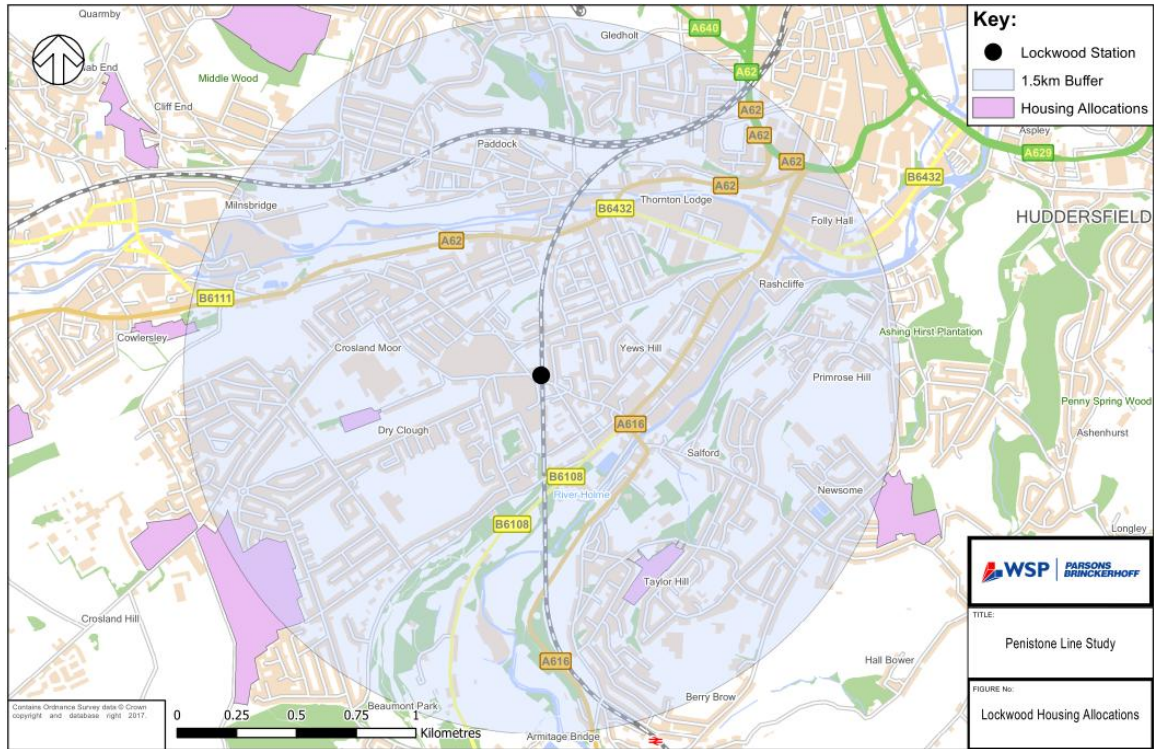
- 5.2.1 This offers high level analysis of the likely impact of future development on demand for park and ride at the Penistone Line stations.

## LOCKWOOD

### 5.2.2

Figure 5-1 shows future development within 1.5km of Lockwood station. This quantum of development is likely to have some impact of the demand for park and ride as most of the sites are located to the south and west of the station, that is, not on the Huddersfield side of the station.

Figure 5-1 – Future development near Lockwood

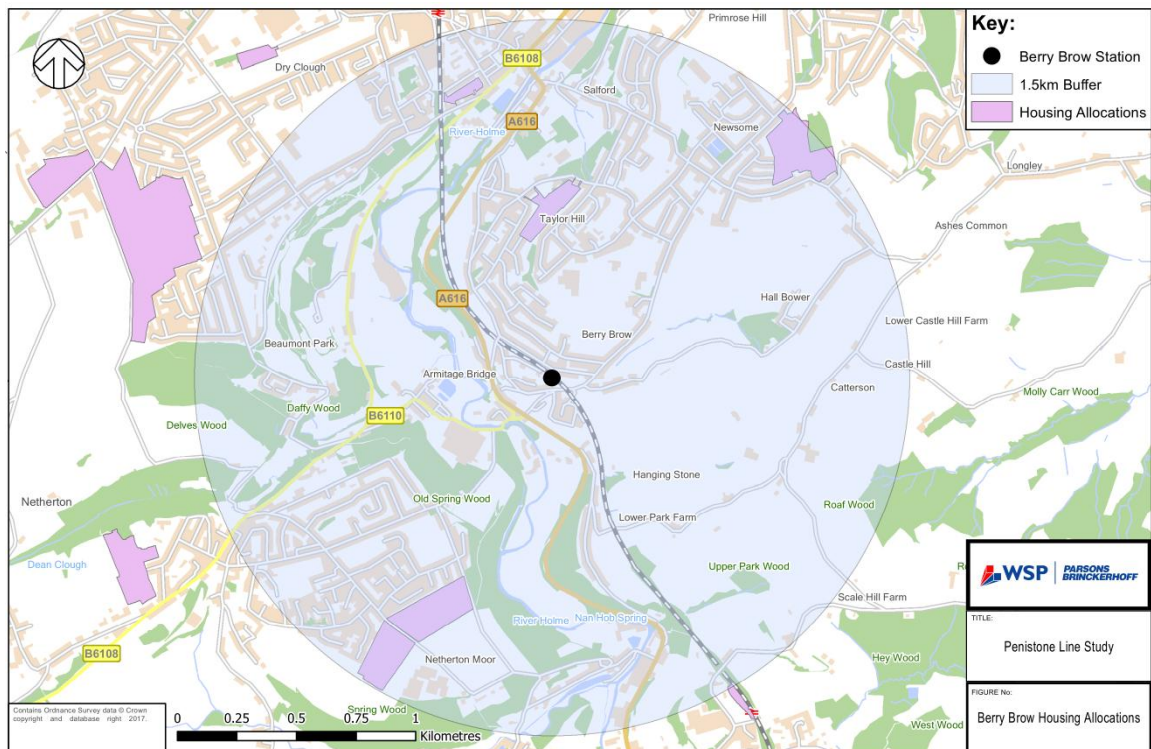


## BERRY BROW

### 5.2.3

Figure 5-2 shows future development within 1.5km of Berry Brow station. This quantum of development within a short drive of the station is likely to have some impact of the demand for park and ride, especially the site to the south. Lockwood may be more attractive for the site to the north.

**Figure 5-2 – Future development near Berry Brow**

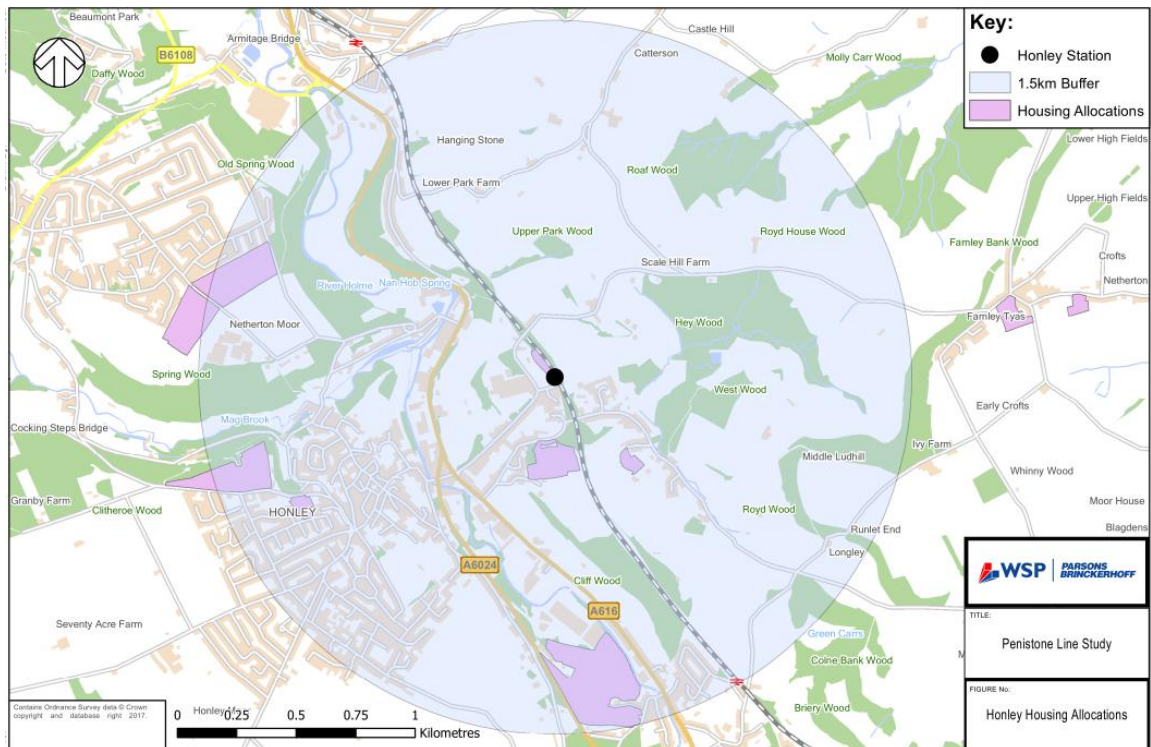


## HONLEY

5.2.4

Figure 5-3 below shows future development within 1.5km of Honley station. This quantum of development is likely to have a more significant impact of the demand for park and ride, particularly given that much of it is located to the south so Honley station would be en route to Huddersfield for residents of these sites.

Figure 5-3 – Future development near Honley



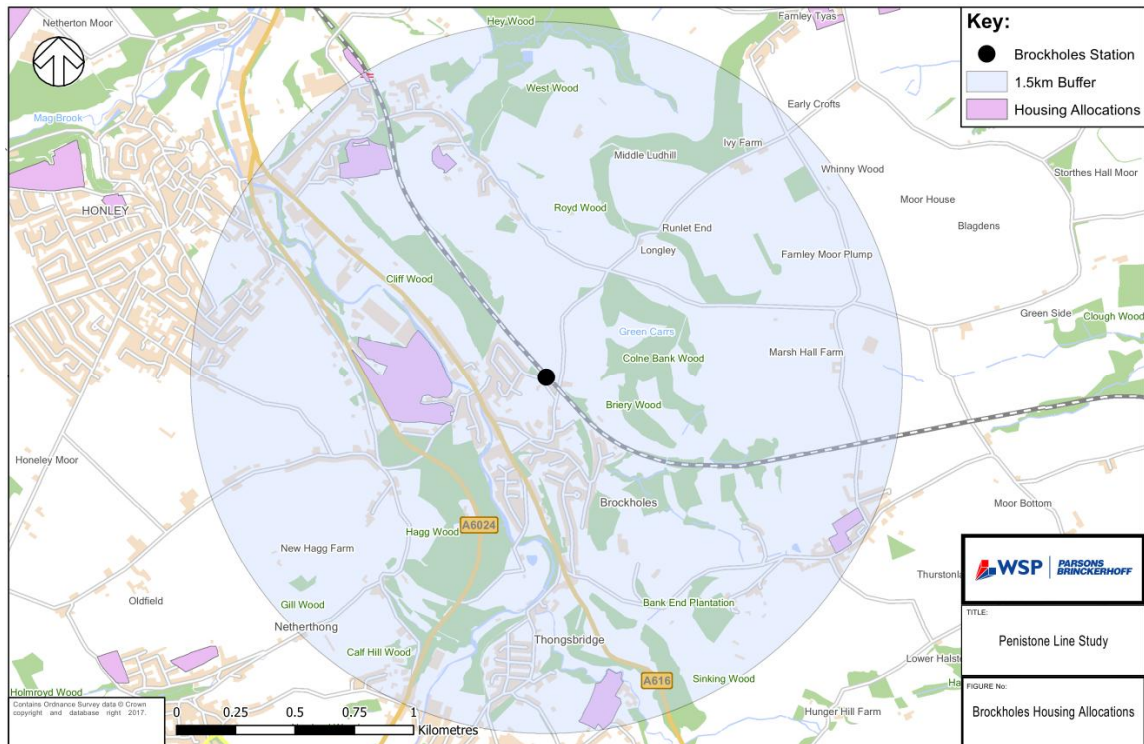


## BROCKHOLES

### 5.2.5

Figure 5-4 shows future development within 1.5km of Brockholes station. This quantum of development is likely to have a more impact of the demand for park and ride, especially the large site to the west of the station.

**Figure 5-4 – Future development near Brockholes**



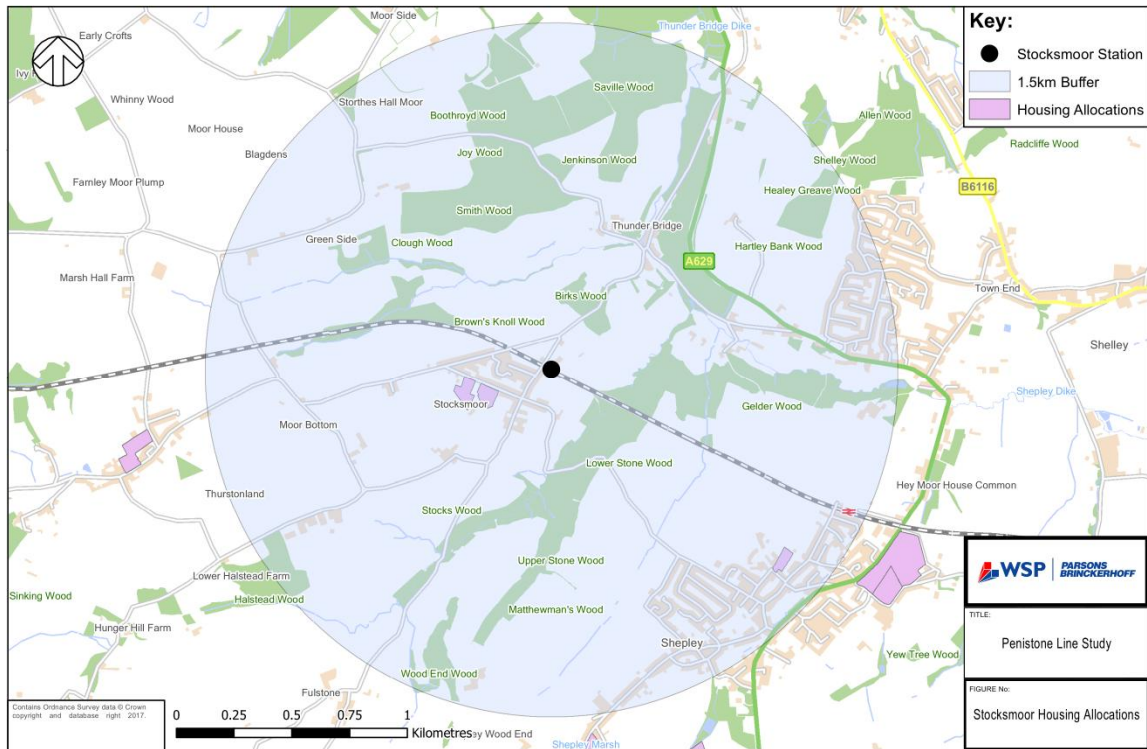


## STOCKSMOOR

### 5.2.6

Figure 5-5 shows future development within 1.5km of Stocksmoor station. This quantum of development is likely to have a very limited impact on demand for park and ride: there are only two small sites and both are within walking distance of the station.

**Figure 5-5 – Future development near Stocksmoor**

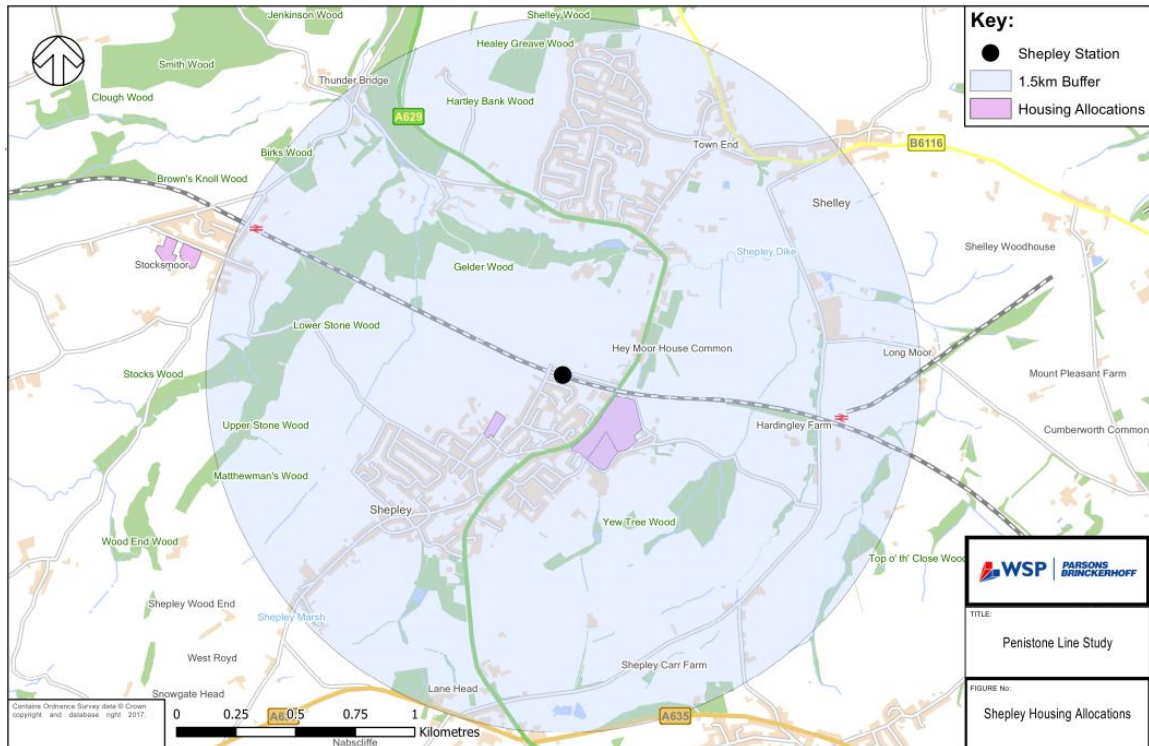


## SHEPLEY

### 5.2.7

Figure 5-6 below shows future development within 1.5km of Shepley station. This quantum of development is likely to have some impact on demand for park and ride at the station. Although the two sites are largely within walking distance of the station, driving to the station is likely to be an attractive option for many residents at this distance, not least because the walking route is not direct.

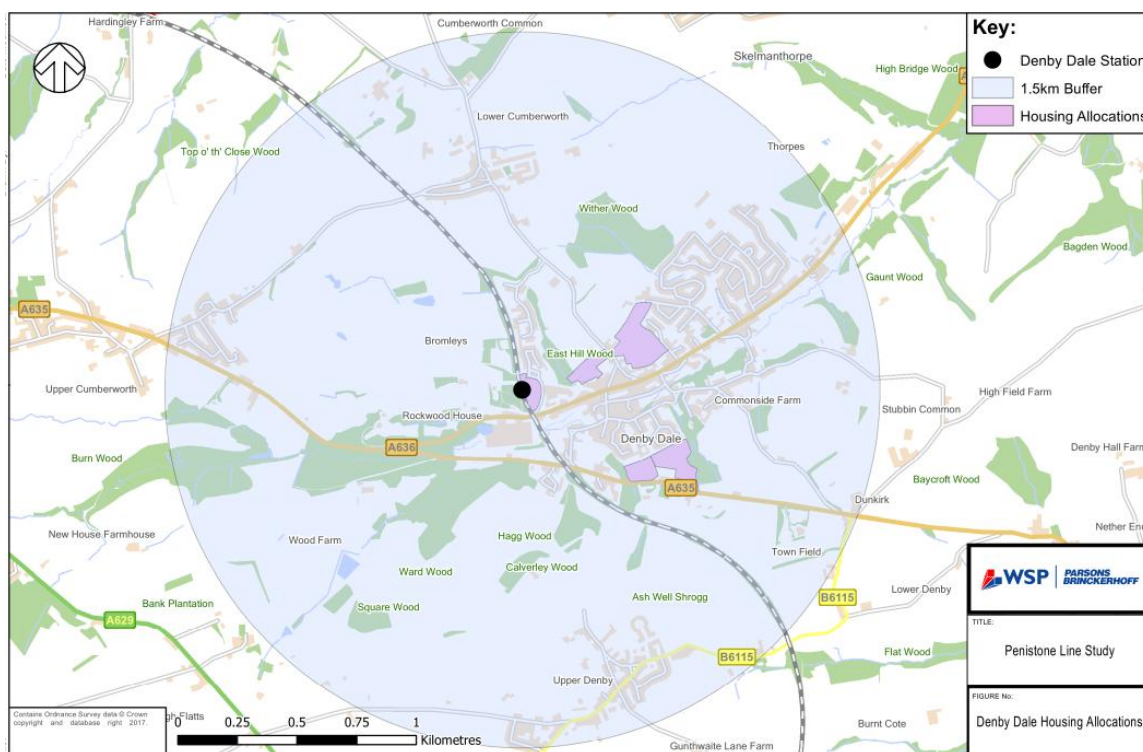
**Figure 5-6 – Future development near Shepley**



## DENBY DALE

- 5.2.8 Figure 5-7 shows future development within 1.5km of Denby Dale station. This quantum of development is likely to have a more significant on demand for park and ride at the station. There are several sites and most of them are beyond the range of an easy walk to the station, which makes driving to the station an attractive option for residents.

Figure 5-7 – Future development near Denby Dale



## 5.3 TRIP RATES

### METHODOLOGY

- 5.3.1 Using data on the site allocations in the Draft Local Plan for Kirklees, the quantum of dwellings units allocated within a 1.5km radius of each station was calculated.
- 5.3.2 Using the Trip Rate Information Computer System (TRICS) this data was used to forecast the number of vehicle trips that would be generated by this future development. The vehicular trip rate was calculated for weekday AM peak departures.
- 5.3.3 It was assumed that the dwellings would be privately owned and that levels of car ownership would exceed 0.5 cars per household. The forecast was based on surveys held by TRICS taken since 2004 on comparable sites in England, Wales and Scotland, excluding Greater London. The parameters for surveys held by TRICS were calibrated differently for each station to reflect the population resident within one to five miles of each station and the settlement type.
- 5.3.4 It should be noted that some sites fall within a 1.5km radius of more than one station. This permits an analysis of the likely impact of future development on individual stations, but it is important to be aware of this when comparing the case for investment at two or more adjacent stations. Moreover, this means that the trip forecasts for the stations cannot be aggregated as this would result in double-counting the same sites.

## ANALYSIS

5.3.5 Table 5-8 presents the results of this forecast. This provides an indication of the potential level of new demand for park and ride as many of these vehicle users could be intercepted at Penistone Line stations.

**Figure 5-8 – Forecast of vehicular trips generated by new development near Penistone Line stations**

STATION	NEW DWELLINGS WITHIN 1.5KM	TRIP RATE AM DEPARTURES (VEHICLES)	NEW TRIPS AM DEPARTURES (VEHICLES)
Lockwood	335	0.405	136
Berry Brow	524	0.405	212
Honley	597	0.389	232
Brockholes	306	0.420	129
Stocksmoor	54	0.346	19
Shepley	70	0.346	24
Denby Dale	268	0.346	93

5.3.6 The table above indicates that more vehicular trips are likely to be generated in the AM peak in the vicinity of Group A stations and, in particular, in the vicinity of Honley and Berry Brow which are forecast to have the highest number of trips.

5.3.7 The number of vehicular trips generated in the vicinity of Group B stations is significantly lower than it is for Group A stations. The difference between Group A and Group B is related more to the quantum of development around stations in each group (which varies significantly) than the trip rates for stations in each group (which are more similar).

5.3.8 Denby Dale is somewhat of an outlier in Group B as significantly more vehicular trips are forecast there than in the other Group B stations.

5.3.9 It is important to note that while this analysis can usefully compare the likely impact of future development on demand for park and ride between stations, it does not assess whether this level of demand is sufficient to justify investment. Consequently, it helps to identify where investment might be prioritised, not whether that investment should be made in the first instance.

## 5.4 CONCLUSION

5.4.1 Three key conclusions can be drawn from this section:

1. Future development is likely to increase demand for park and ride at stations in Group A more than stations in Group B.
2. Within Group A, the demand for park and ride is likely to rise as a result of future development more significantly at Honley.
3. Within Group B, the demand for park and ride is likely to rise as a result of future development more significantly at Denby Dale.

# 6 CONCLUSION

## 6.1 THE MARKET FOR PARK AND RIDE

6.1.1 Analysis of journeys to work in the Penistone Line catchment area suggests that park and ride on the Penistone Line could target two key markets of residents in the Penistone Line catchment area:

- Existing car commuters who work in Huddersfield town centre, who could be intercepted at Lockwood, Berry Brow, Honley and Brockholes (Group A). This is the major potential market.
- Existing car commuters who work in Leeds, who could be intercepted at Group A stations. This is a smaller potential market.

6.1.2 The low levels of rail usage suggests that, at present, rail does not appeal to most commuters.

## 6.2 THE APPEAL OF PARK AND RIDE

6.2.1 Analysis of comparative journey times indicated that park and ride is only likely to be competitive with the car for travel between Group A stations and Leeds. Park and ride is unlikely to be competitive for any other journey type, including for trips to Huddersfield, which is the main destination for residents of the Penistone Line catchment.

6.2.2 The potential for transformative change to render the Penistone Line more attractive to commuters by improving journey times and service levels is severely constrained by infrastructural and operational barriers. There is no prospect of overcoming these obstacles for the foreseeable future. This means that it is unlikely to be possible to effect improvements to the line that would make it attractive to the potential markets for park and ride.

## 6.3 LOCATING PARK AND RIDE

6.3.1 Analysis of potential park and ride sites indicates that investment in increasing station parking capacity is unlikely to represent good value for money at any of the Penistone Line stations. Investment at sites at Honley and Denby Dale may represent moderate value for money but further investigation would be needed to confirm this.

## 6.4 FUTURE DEMAND FOR PARK AND RIDE

6.4.1 Analysis of residential site allocations suggests that demand for park and ride is likely to increase in the vicinity of Group A stations more than at Group B stations. Overall, demand is likely to increase the most around Honley station and, within Group B, at Denby Dale station.

## 6.5 CONCLUSION

6.5.1 This study concludes that the potential for successful park and ride facilities on the Penistone Line is currently limited and this is unlikely to change for the foreseeable future. Should park and ride be developed it is likely to deliver most value at stations in Group A, targeting car commuters travelling to Huddersfield and Leeds. Honley station offers the most promise.

6.5.2 More detailed feasibility studies are required to validate these high level conclusions.

# Appendix A

**PDFH CALCULATIONS**



## PDFH Forecasting

- 6.5.3 As part of the Penistone Line Study commission efforts have been made to understand what demand there may be for parking at each station. One of the means of doing so is to use the Passenger Demand Forecasting Handbook (PDFH). PDFH is the rail industry's principal repository of rail passenger demand forecasting expertise, and it is used in conjunction with the Department for Transport's Appraisal Guidance (TAG). PDFH summarises collective rail industry knowledge of the effect that various influences can have on passenger demand, such as increased parking provision.
- 6.5.4 PDFH has been used to calculate the increase in demand (entries using a season ticket) which could be expected if an unlimited amount of secure parking were to be provided on site. In order to do this a number of assumptions were made. Key assumptions include:
- That all the existing spaces are full and that any new passengers (attracted to using the rail network as a result of car parking provision being enhanced) are new rail passengers. In reality we know that a small number of rail passengers will simply change how they get to the station, choosing to drive rather than walk or cycle.
  - That the length/nature of the walk between the car parking space and the station platforms is irrelevant and that the spaces provided must simply be 'secure' and reserved for rail station users only. In reality we know the route between the two is important and that the further the walk between a space and the platform the less likely someone is to use it.
  - That the level of passenger experience across the rail network is the same across the region. In reality we know many stations offer superior facilities to others and that certain services benefit from superior rolling stock to others.
  - That the new parking provided is free of charge.
  - That each station studied is within commuting distance, via a direct rail service, of only one key employment centre. In reality we know that several stations, such as Guiseley in Leeds, are within commuting distance of two such centres (e.g. Leeds and Bradford).
  - That the stations being studied can be categorised as 'Non London Urban' for the purposes of demand forecasting parameters (e.g. elasticity of demand).
  - That journey times by car to the station car park remain the same as parking provision increases. In reality we know that increased traffic around a station can make driving to it less appealing.
  - That the Office of Rail & Road data published for 2015/16 represents the best data available.
  - That 95% of the total entries made into each station using a season ticket (ORR data) are during weekdays.
  - That there are only 261 ordinary working weekdays each year.
- 6.5.5 The equation used to calculate the demand uplift at each station is shown below in Figure A1.1.

*Figure A1.1: PDFH demand forecasting equation*

$$\frac{AB}{C} \times \left( \frac{(D+E)-F}{D+E} \right)^G - \frac{AB}{C} = \text{Estimated increase in demand (entries per working weekday)}$$

6.5.6

The value of each variable has been derived using the data in Table A1.1.

*Table A1.1: PDFH equation variables*

LETTER	VALUE	DESCRIPTION
A	0.95	95% of the total season ticket entries per annum are estimated to be during weekdays.
B	Variable	Estimated entries made to the station using a season ticket 2014/15– Office of Rail & Road figures
C	261	An estimate of how many ordinary working days there are each year.
D	Variable	The average direct AM peak journey time to a major urban centre (1 minute:1)
E	Variable	The service interval penalty (1 minute:1) for a Non London Urban station (PDFH Table B.4.8)
F	5	The equivalent time saving for providing a secure station car parking (PDFH B10.5.2)
G	-0.9	Time elasticity of demand based on PDFH recommendations table B4.5 'Non London'

An example of the model being applied is shown in Figure A1.2. This uses data collected for Guiseley Station in Leeds.

*Figure A1.2: Guiseley Station PDFH model*

$$\frac{0.95 \times 227,156}{261} \times \left( \frac{(15+15)-5}{15+15} \right)^{-0.9} - \frac{0.95 \times 227,156}{261} = 148$$

6.5.7

The PDFH formula applied above indicates that if there was no limit on the number of car parking spaces that could be provided to meet demand, there would be an increase in demand for parking of 148 passengers per day. It can be assumed that each of these passengers will require one parking space. We can infer that if more than an additional 148 spaces were provided those spaces may not be used.





























