# Technical Note

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| Project: | Elland Station and Access Package | | |
| Subject: | Distributional Impact Appraisal | | |
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# 1. Introduction

This technical note details the findings of a Distributional Impact (DI) Appraisal undertaken for the addition of a rail station and associated station access package scheme in Elland, West Yorkshire. The station access package refers to the construction of two bridges, and improvements to the cycleways and footway network in addition to public real enhancements. For fuller details of the scheme proposals refer to the Elland Station and Access Package Full Business Case, to which this DIA forms an Appendix.

Distributional impacts consider the variance of transport intervention impacts across different social groups. The analysis of DIs is mandatory in the appraisal process and undertaken in accordance with WebTAG guidance Unit A4.2 and is a constituent of the Appraisal Summary Table (AST). Both beneficial and /or adverse DIs of transport interventions are considered, along with the identification of social groups likely to be affected.

## 1.1. Methodology

The eight indicators considered within the DI appraisal are: User Benefits, Air Quality, Noise, Personal Security, Severance, Accessibility, Personal Affordability and Accidents.

The DI process involves three stages: Screening; DI Assessment; and Appraisal of Impacts, as outlined in below.

**Table 1 - DI Process**

| Step | | Description | Output |
|---|---|---|---|
| Screening | 1 | Identification of likely impacts for each indicator | Screening Proforma |
| Full appraisal | 2 | Assessment: | DIs social groups statistics and amenities affected within the impact area |

| | | |
|---|---|---|
| | • Confirmation of the area impacted by the transport intervention (impact area)<br>• Identification of social groups in the impact area (such as transport users, people living in those areas affected by the scheme)<br>• Identification of amenities in the impact area | |
| 3 | Appraisal of impacts:<br>• Core analysis of the impacts (including providing an assessment score for each indicator based on a seven point scale – large beneficial to large adverse)<br>• Full appraisal of DIs and input into AST | Appraisal tables and AST Inputs |

# 2. Outcome of Screening

Phase one of the DI process involved the completion of a screening proforma, based upon qualitative judgement of the likely impacts of the station and access package scheme on each of the eight indicators.

The outcome of this screening process identified that all eight indicators would need to be taken forward to the next stage of the DI analysis to fully understand the impact of the scheme options on these indicators.

For the assessment and appraisal, it is considered that the benefits will be largely for those who live within Elland to access jobs, health care and other facilities outside of Elland. It is noted that there will be some benefits for those who come to work/visit facilities in Elland, however, for the purpose of this assessment it is considered negligible. For our study area we have used the catchment area of the station for those that travel to Leeds as this is considered to be a representative area for those living within Elland who will be impacted by the addition of station.

Socio -demographic mapping has been included which details where there are high proportions of vulnerable populations living either in the catchment area of the station, this will help with the analysis.

Please see the below key for representing the 7-point distributional scale outcome for each vulnerable group.

*Figure 1 Key to individual assessment of each quintile*

| | |
|---|---|
| *Large Beneficial* | ✓✓✓ |
| *Moderate Beneficial* | ✓✓ |
| *Slight Beneficial* | ✓ |
| *Neutral* | ***0*** |
| *Slight Adverse* | × |
| *Moderate Adverse* | ×× |
| *Large Adverse* | ××× |

# 3. Appraisal

## 3.1. Accessibility

### 3.1.1. Screening

There will be positive impacts for people in Elland with improvements to both active modes and public transport accessibility. Minor changes to train timings as a consequence of the additional halt at Elland will have a minor impact upon accessibility for those travelling along all routes stopping at this station. Therefore, a full DI appraisal is conducted.

### 3.1.2. Assessment

#### 3.1.2.1. Confirmation of Impact Area

The assessment area for this appraisal has included consideration of changes to accessibility due to the additional stop at the new Elland station. The study area includes the catchment area for those residents travelling to Leeds and Manchester. It has been assumed that limited trips will be generated by the new station for non-residents travelling to Elland, due to the limited number of local amenities in the area. Therefore, this appraisal only considers the impact on accessibility to residents in Elland, who may use the new station to access cities such as Leeds and Manchester.

#### 3.1.2.2. Step 2b: Identification of Social Groups in Impact Area

*Table 2 Proportion of groups within the catchment areas compared to England and Wales*

| Group | England and Wales | Catchment Area |
|---|---|---|
| Older People (Aged 70+) | 12.5% | 11.6% |
| Children (People Aged Under 16) | 19.0% | 19.8% |
| No Car Households | 10.7% | 12.6% |
| Disability Living Allowance Claimants | 8.6% | 8.6% |
| Women | 50.8% | 51.4% |
| Black and Minority Ethnic (BME) | 14.6% | 5.5% |
| JSA (Job Seekers Allowance) Claimants | 2.9% | 3.5% |

#### 3.1.2.3. Step 2c: Identification of Amenities in Impact Area

Within the catchment area there are 12 schools/nurseries and 6 care homes, as well as several other amenities such as churches, retail stores and health centres. This DI appraisal therefore assumes the presence of all vulnerable groups (such as older people, children, women, DLA claimants and BME groups) to maintain a proportionate assessment, both in terms of travelling around the impact area and within the daytime population whilst visiting local amenities.

## 3.1.3. Appraisal

### 3.1.3.1. Analysis

**Qualitative Analysis**

There are slightly higher proportions of no car households and women in the area compared to the proportion in England. Since there is only one secondary school in the catchment area, there will be a beneficial impact on accessibility for children attending secondary/high school in nearby towns/cities such as Halifax, Leeds or Brighouse. Additionally, the access package improves non-car connectivity around Elland and West Vale and to the new rail station. This will improve accessibility across the town.

There will be a beneficial impact on accessibility for older people and DLA claimants who may need regular access to a hospital, particularly for DLA claimants who are less likely to drive and hence will be more likely to use public transport. There is only a private hospital in Elland, so lower income households and job seekers allowance claimants, who may be less likely to be able to afford private health care, will require access to a hospital outside of Elland. Lift and stepped access will be provided from car park level on both sides to ensure accessibility.

The scheme will connect Elland to cities such as Leeds and Manchester, which have a much wider range of amenities than are available in Elland. Those without access to a car are more likely to use public transport. Hence, these two vulnerable groups are likely to use the new service to access amenities in surrounding areas and will therefore have a beneficial impact on accessibility due to the scheme. Furthermore, the accessibility of the station will be enhanced through the access package scheme.

While there are retail and factories in Elland which provide a potential place of employment for Job Seekers Allowance (JSA) claimants, the scheme will offer them access to a much wider range of employment opportunities, particularly as claimants are less likely to be able to afford a car. Therefore, the impact on accessibility for JSA claimants will be beneficial.

There is a low proportion of black and minority ethnic residents in the catchment area. Therefore, although they will experience accessibility impact due to the scheme, it will not be significant, assuming the service will mainly be used by residents travelling out of Elland, rather than people accessing amenities in Elland

**Quantitative Analysis**

Spatial accessibility analysis was undertaken using *Basemap TRACC*, which uses transport network data to establish the average time it takes to get from a 'grid' of origins to a destination. Analysis of the public transport network was undertaken which compared morning peak conditions between the 'without scheme' and 'with scheme' scenarios.

4.Appendix AA.1 illustrates the increased accessibility that a railway station at Elland provides. The figures show that the station would allow public transport access for Elland residents to Manchester and Leeds City Centres within an hour. The station would also decrease travel times to other key centres, including Bradford and Rochdale.

Analysis was also undertaken to establish the accessibility to Leeds City Centre specifically, where there are many public services including Leeds General Infirmary. This analysis tested accessibility both with and without the scheme. Again, the increased accessibility from Elland is shown in Appendix 4.A.2, which shows that the scheme would allow many Elland residents to access Leeds within an hour. This is supported by the numbers of car households and no-car households that would experience a decrease in journey times, as shown in Appendix A.3.

The contoured outputs from *Basemap TRACC* were further analysed in terms of the increased accessibility of vulnerable groups to Leeds City Centre. Using census data of the catchment area for the proposed station, it was found that public transport journey times decreased to less than an hour

for a significant proportion of each vulnerable group. The table below shows that the scheme would be most beneficial for black and minority ethnic residents of Elland, as 70% would have their public transport journey times to Leeds decreased to less than an hour if the station is to be built. However, as described above, there are a relatively low number of black and minority ethnic residents in Elland. There is also a particularly significant benefit for no-car households and children.

*Table 3 Proportion of groups who can access Leeds within 60 minutes with and without the scheme*

| Group | % Less Than 60 Minutes | |
|---|---|---|
| | Without Scheme | With Scheme |
| Children (Under 16) | 0% | 53% |
| Older people (70+) | 0% | 44% |
| BME | 0% | 70% |
| Disability Living Allowance | 0% | 28% |
| No car households | 0% | 59% |

The results indicate that this scheme has a **Large Beneficial** assessment score for vulnerable groups.

*Table 4 Summary Table*

| Vulnerable group | New Station |
|---|---|
| Children (under 16) | ✓✓✓ |
| Older people (70+) | ✓✓✓ |
| BME | ✓✓✓ |
| Disability Living Allowance | ✓✓✓ |
| No car households | ✓✓✓ |

### 3.1.3.2. Outcome and Qualitative Comment

The qualitative analysis showed the impact on all vulnerable groups is beneficial. The station scheme and access package could be particularly beneficial for no car households, women and Disability Living Allowance Claimants, who represent a slightly higher proportion of residents in the catchment area than the national average. Hence the impact on accessibility for these two vulnerable groups is large beneficial.

The quantitative analysis also shows that the impact would be beneficial on all vulnerable groups. Although, the number of black and minority ethic residents in the catchment area is small, they would see a beneficial impact in their journey times, particularly to Leeds. The majority of children and no-car households in the catchment will experience a decrease in their public transport journey times to less than an hour. Furthermore, the figures in Appendix A.1 illustrate the overall increased accessibility to and from Elland, for both vulnerable residents and the catchment area as a whole. The railway station would allow some residents to reach Manchester and Leeds City Centres in less

than an hour whilst the access package scheme would enhance non-car access to the proposed station.

In summary, the overall impact on accessibility due to the scheme is **Large Beneficial**.

## 3.2. Severance

### 3.2.1. Screening

There will be no change to the current train corridor nor highway additions with the current option. However, the provision of new pedestrian/cycle bridges across both the River Calder and Calder and Hebble Navigation may have an impact on severance. A station could increase traffic flow on the roads in the vicinity, an increase in traffic levels on approach roads may impact on physical or perceived severance in the area and this should be investigated. Therefore, we continue to full DI appraisal.

### 3.2.2. Assessment

#### 3.2.2.1. Confirmation of Impact Area

The WebTAG DI guidance (Unit A4.2) recommends the impact area for severance to include any location with physical changes in road alignment or where links on the road network will experience significant changes in traffic flows and or speeds (>10%). Due to the analysis undertaken, traffic flows/speeds were not made available, therefore this assessment is qualitative and has been based on an assessment of the likely traffic flow surrounding the new station location and proposed locations of new pedestrian/cycle bridges.

#### 3.2.2.2. Step 2b: Identification of Social Groups in Impact Area

*Table 5 Proportion of the vulnerable groups within the Catchment area*

| Group | England | Catchment Area |
|---|---|---|
| Older People (Aged 70+) | 12.5% | 11.6% |
| Children (People Aged Under 16) | 19.0% | 19.8% |
| No Car Households | 10.7% | 12.6% |
| Disability Living Allowance Claimants | 8.6% | 8.6% |

#### 3.2.2.3. Step 2c: Identification of Amenities in Impact Area

There are a number of amenities that would attract vulnerable groups. This includes 12 schools/nurseries and 6 care homes within the catchment area, as well as several other amenities such as churches, retail stores and health centres.

### 3.2.3. Appraisal

#### 3.2.3.1. Analysis

There is likely to be an increase traffic in the vicinity of the station, this may affect users' perception of severance. The station and associated car park is likely to attract a greater number of car trips to the area than there currently are. Key routes in the town centre towards the station are likely to experience an increase in traffic. There are a high proportion of DLA claimants (shown in the map in Appendix B.4) within the vicinity of the station, furthermore there are a high proportion of no car

households (shown in the map in Appendix B.2), these may experience adverse severance impacts.

However, there is the assumption some of this will be reduced with the Elland Access package including improvements to pedestrian and cycling fa cilities between the station and significant areas of the town. The scheme includes a package of measures designed to improve pedestrian and cycle access between the station, the town centre and significant areas of planned housing and employment growth in Elland. These improvements include new foot and cycle bridges over both the River Calder and Calder and Hebble Navigation to the west of the station. This has a beneficial impact on severance as pedestrians will more easily be able to access the station and local amenities within Elland. This may particularly benefit DLA claimants, as there is a high proportion of this vulnerable group in the area where the bridges as proposed.

There may also be a reduction in severance for those located on key routes from Elland to major cities as these may be a mode shift from car to rail as a result of the scheme.

#### 3.2.3.2. Outcome and Qualitative Comment

*Table 6 The overall assessment for each vulnerable group*

| Vulnerable group | Option |
|---|---|
| Older People (Aged 70+) | **0** |
| Children (People Aged Under 16) | **0** |
| Disability Living Allowance (DLA)Claimants | **0** |
| No car households | **0** |
| **Overall appraisal** | **0** |

There is a neutral impact to severance for elderly people in Elland, as there are no high proportions of this group within the catchment area. There is also a neutral impact for children, no car households, and DLA claimants and as they will benefit from the improvements to pedestrian facilities, which they are likely to use to access the station and other key amenities in the town, although they may be affected by the additional traffic on key roads near the station.

Therefore, the overall impact of the scheme to severance, is **Neutral**.

# 3.3. Security

## 3.3.1. Screening

Enough lighting and CCTV will need to be installed in the pedestrian and cycle access, car park and the platform access in order to affect user perceptions of personal security, especially vulnerable populations. Therefore, an examination of any changes to perception of user security will need to be undertaken. Therefore, we continue to full DI appraisal.

## 3.3.2. Assessment

### 3.3.2.1. Confirmation of Impact Area

The impact area for this personal security appraisal has included consideration of changes to personal surveillance and changes to security, due to the addition of a train station in Elland. A catchment area is considered to assess the impact on pedestrians, who either live and/or work in the area surrounding the station and may use this to access a wider range of destinations.

### 3.3.2.2. Step 2b: Identification of Social Groups in Impact Area

*Table 7 The proportions of each vulnerable group within the catchment area*

| Income group | England | Catchment Area |
|---|---|---|
| Older People (Aged 70+) | 12.5% | 11.6% |
| Children (People Aged Under 16) | 19.0% | 19.8% |
| Disability Living Allowance Claimants | 8.6% | 8.6% |
| Black and Minority Ethnic Groups (BME) | 14.6% | 5.5% |
| Women | 50.8% | 51.4% |

### 3.3.2.3. Step 2c: Identification of Amenities in Impact Area

Within the study area there are 12 schools/nurseries and 6 care homes, as well as several other amenities such as churches, retail stores and health centres.. This DI appraisal therefore assumes presence of all vulnerable groups (such as older people, children, women, DLA claimants and BME groups) within the assessment, both in terms of travelling around the impact area and within the daytime population whilst visiting local amenities.

## 3.3.3. Appraisal

### 3.3.3.1. Analysis

No footbridge will be provided as part of the scheme and access between both sides of the track will be gained via the underpass on Lowfields Way. Public realm improvements are proposed for the underpass which may have a beneficial impact on perceptions of personal security for users who currently use the underpass to access local amenities in Elland. However, vulnerable groups may also have a perceived adverse impact on personal security as they may have to use the underpass to access a station platform. It is assumed that any new trips through the underpass due to the scheme will have a negligible adverse impact on user perceptions of personal security following the public realm improvements.

The addition of new pedestrian/cycle bridges across both the River Calder and Calder and Hebble Navigation to the west of the station may improve users perceived impact on security. This may particularly benefit DLA claimants' as there is a high proportion of both groups in the area (see map in Appendix B.4) where the pedestrian/cycle bridges would be constructed.

The area contains a higher than the national average population of women and children. Extra consideration should be made to consider these station users, for example by installing clear lighting and CCTV cameras to increase station safety. There are areas with high proportions of all considered vulnerable groups in the catchment area for the new station other than older people. Please see maps in Appendix B.1, B.3,B.5 and B.6 which show where the high proportions of older people, children, disability living allowance claimants and women are within the catchment area of the station.

It is assumed that due to the new station there will be an increase in footfall and therefore increasing informal surveillance which could possible increase the users' perception of security. It is also assumed that sufficient lighting will be added at the stations, in the car park as well as CCTV to improve the users' perception of personal security.

#### 3.3.3.2. Outcome and Qualitative Comment

*Table 8 The overall outcome for each vulnerable group*

| Vulnerable group | Option |
|---|---|
| Older People (Aged 70+) | **0** |
| Children (People Aged Under 16) | ✓ |
| Disability Living Allowance Claimants | ✓ |
| Black and Minority Ethnic Groups (BME) | **0** |
| Women | ✓ |
| **Overall appraisal** | ✓ |

There is a neutral impact for older people and BME vulnerable groups as there are no high proportions of elderly and there is a low proportion of BME people within the catchment area. Hence, this group is unlikely to perceive any impact to personal security due to the scheme.

There is a slight beneficial impact to children, women and DLA claimants due to the scheme. There are areas with high proportions of all these vulnerable groups within the catchment area who may benefit from the public realm improvements to the station area and the foot and cycle provisions included in the scheme.

Therefore, the overall impact of the scheme on users' perceptions of personal security is **slight beneficial**.

# 3.4. Accidents

## 3.4.1. Screening

Any modal shift from car to train may reduce traffic and which could lead to a reduction in accidents. Furthermore, increased vehicles on the access road/local roads to the station may lead to an increase in accidents. Therefore, we will continue to full DI appraisal.

## 3.4.2. Assessment

### 3.4.2.1. Confirmation of Impact Area

There has not been a COBA-LT assessment undertaken, therefore, a qualitative assessment has been carried out based on professional judgement on the areas that have the potential to have an impact on casualties and the historic casualties on the road network surrounding Elland Station

### 3.4.2.2. Step 2b: Identification of Social Groups in Impact Area

*Table 9 Historic casualty statistics (2012-2016) Nationally and within the catchment area for each vulnerable user group*

| Casualty Type | All Casualties (national rate) | | All Casualties (catchment area) | |
|---|---|---|---|---|
| | N | % | N | % |
| **Vulnerable Users** | | | | |
| Pedestrians | 121,610 | 20.0% | 121 | 11.0% |
| Cyclists | 97,137 | 16.0% | 51 | 4.6% |
| Motorcyclists | 96,882 | 16.0% | 93 | 8.4% |
| Male drivers aged 16-24 | 100,793 | 16.6% | 92 | 8.3% |
| **Vulnerable Groups** | | | | |
| Under 16 | 81,813 | 13.5% | 101 | 9.1% |
| People aged 70+ | 35,641 | 5.9% | 46 | 4.2% |
| **Total Casualties** | **606,755** | **100%** | **1105** | **100%** |

### 3.4.2.3. Step 2c: Identification of Amenities in Impact Area

Identification of key amenities in the accidents impact area has not been completed in detail at this stage to maintain a proportionate assessment. This DI appraisal therefore assumes presence of all vulnerable groups within the assessment, both in terms of travelling around the impact area and within the daytime population whilst visiting local amenities.

## 3.4.3. Appraisal

### 3.4.3.1. Analysis

There are currently below national average proportions of accidents in the study area for all vulnerable users. The improvements to pedestrian and cycle provision in the area may increase the number of pedestrians and cyclists in the vicinity of the station which in turn might increase the likelihood of accidents. However, it is anticipated the additional cycling and walking provision are to improve the safety to cyclists and pedestrians. Therefore, there may be a reduction in collisions involving cyclists and pedestrians due to the improved safety measures associated with the infrastructure. Therefore, there is likely to be a neutral impact on accidents for pedestrians and cyclists.

There is expected to be an increase in traffic in the vicinity of the station due to people using their vehicles to access the new station. There are a high proportion of children living within the vicinity of the station therefore, there may be a slight adverse impact for this vulnerable group due to the possibility of an increase in accidents. This may slightly outweigh any potential accident benefits for the mode shift for this vulnerable user group along the key route corridors. There are a low proportion of elderly people living therefore, there is unlikely to have the same affect for this vulnerable group and it is expected to be a neutral impact for this vulnerable user group.

The impact on motorcyclists and young male drivers will be neutral, as there may be increased accidents in the vicinity of the station, but reduced accidents on the main routes to and from Elland. This is due to an increase in traffic surrounding the new station, but a reduction on the main routes to key destination towns and cities from Elland. There are a low proportion of accidents involving young male drivers and motorcyclist casualties within the catchment area therefore, it is anticipated the benefit from a reduction of traffic on the main routes and the potential increase in accidents due to the congestion around the station are likely to give a neutral impact for these vulnerable user groups.

#### 3.4.3.2. Outcome and Qualitative Comment

*Table 10 Overall outcome for each vulnerable user group*

| Group | Option |
|---|---|
| Pedestrians | ***0*** |
| Cyclists | ***0*** |
| Motorcyclists | ***0*** |
| Children | **×** |
| Young male drivers | ***0*** |
| Older people | ***0*** |
| Overall score | ***0*** |

There may be a slight adverse impact for children as there are a high proportion living in close proximity to the station, which is expected to have an increase in traffic due to the new station.

There is a neutral impact to accidents for motorcyclists, young male drivers, pedestrians, cyclists and older people, as there may be an adverse impact in the vicinity of the new station. However, this is offset by the beneficial impact to those travelling on the main routes to/from Elland. Hence, the overall impact to accidents is **Neutral.**

# 3.5. Air Quality

## 3.5.1. Screening

It is not anticipated there will be significant changes to air quality levels as a result of the changes in the train timetabling. The inclusion of a car park and strategic Park & Ride near the station could increase the number of vehicles travelling in the vicinity and hence increase emissions on the local roads approaching the station. The new train station could however result in some people changing their transport mode from car to train, which could reduce traffic and the consequent air quality emissions in the area. Furthermore, the Access Package scheme of walking and cycling measures could result in a modal shift away from private car to journeys by bike or by foot to reach the station, thus reducing local traffic and air quality. Therefore, we will continue to full DI appraisal.

## 3.5.2. Assessment

### 3.5.2.1. Confirmation of Impact Area

The assessment area for this appraisal has included consideration of changes to air quality in the vicinity of the new station as well as areas surrounding the main routes from Elland to destination towns and cities which may be impacted due to the modal shift from private car to rail modes of transport making these trips.

### 3.5.2.2. Step 2b: Identification of Social Groups in Impact Area

*Table 11 Proportions of each vulnerable group within the catchment area*

| Group | England | Catchment Area |
|---|---|---|
| Quintile 1 (most deprived) | 20.0% | 24.8% |
| Quintile 2 | 20.0% | 29.5% |
| Quintile 3 | 20.0% | 21.4% |
| Quintile 4 | 20.0% | 17.0% |
| Quintile 5 (least deprived) | 20.0% | 7.2% |
| Children (under 16) | 19.0% | 19.8% |
| Older People (Over 70) | 12.5% | 11.6% |

### 3.5.2.3. Step 2c: Identification of Amenities in Impact Area

There is a nursery, a Primary and Secondary school within close proximity of the proposed station, which are all likely to have a high proportion of children. There is a care home about 500m from the proposed station and a hospital roughly 250m away. The main routes from Elland towards Leeds, Bradford and Manchester follow the M62 through rural areas, hence there are few amenities in the vicinity which may attract vulnerable receptors. The main routes to Brighouse follows the A643

which has several amenities such as three schools and five care homes within 200m of the route. The main routes to Huddersfield follows the A629 which has five care homes and a nursery within 200m of the route.

## 3.5.3. Appraisal

### 3.5.3.1. Analysis

The people who are likely to benefit from the scheme, due to improved air quality in the area are those in the vicinity of the main routes linking Elland with destination cities. We can expect a degree of benefits to those around the station and across the town due to the enhanced walking and cycling facilities, there is an expected disbenefit for those who live within close proximity to the station, due to increased vehicular travel to and from the station.

The maps show the 20% highest proportions of vulnerable receptors in the UK overlaid with the main routes from Elland to the surrounding towns and cities which the most residents living with Elland are likely to visit. As well as the 20% highest proportions of vulnerable receptors in the UK within the station catchment area is located within 4.B.7.

*Figure 2 Income structure within 200m of main routes to/from Elland*

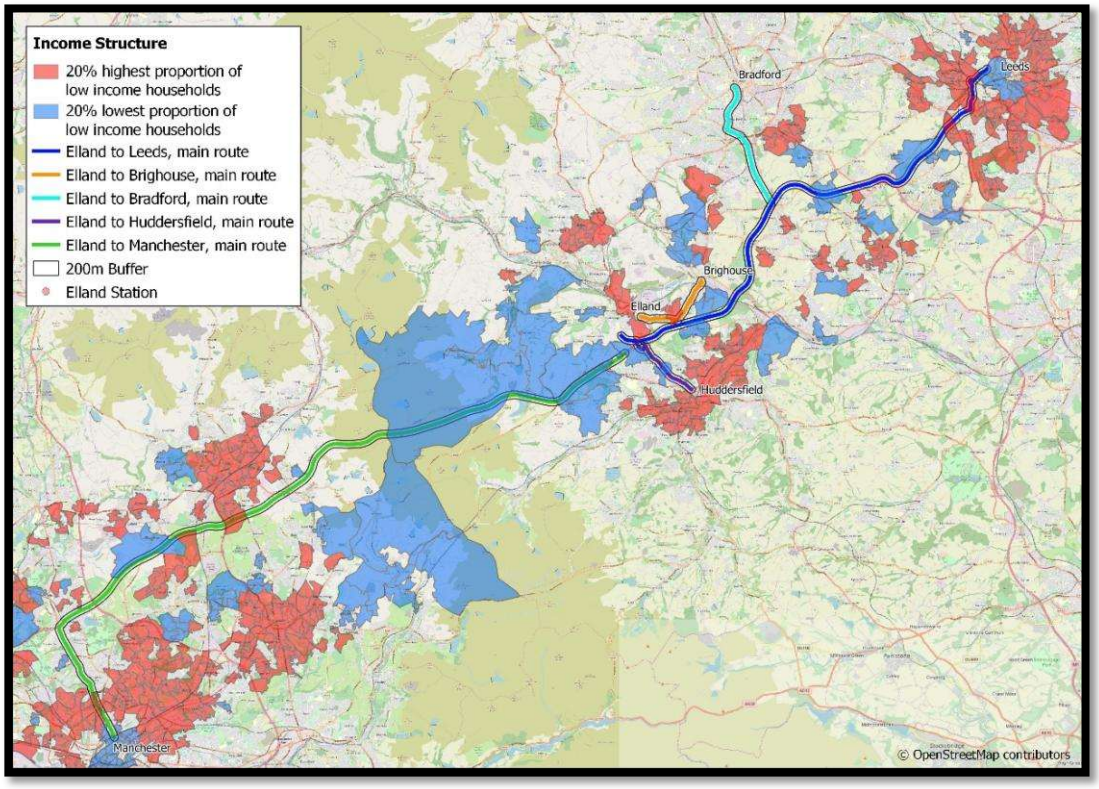



Figure 2 shows that there are areas with high proportions of low income households which are within 200m of the main routes to Leeds, Manchester and Huddersfield. Therefore, there is a beneficial impact on air quality due to the scheme for these low-income households due to reduced vehicle trips to these places originating in Elland. However, there is also an area in the centre of Elland with high proportions of low-income households shown in Appendix B.7. There will be a slight adverse impact on air quality for residents in this area due to increased vehicle trips to the new station. Hence, the overall impact on air quality for low-income households is neutral. It is hoped that this adverse air quality impact is further lessened by the access package scheme improving walking and cycling accessibility to the station and across Elland town centre.

*Figure 3 High proportions of elderly within 200m of main routes to/from Elland*

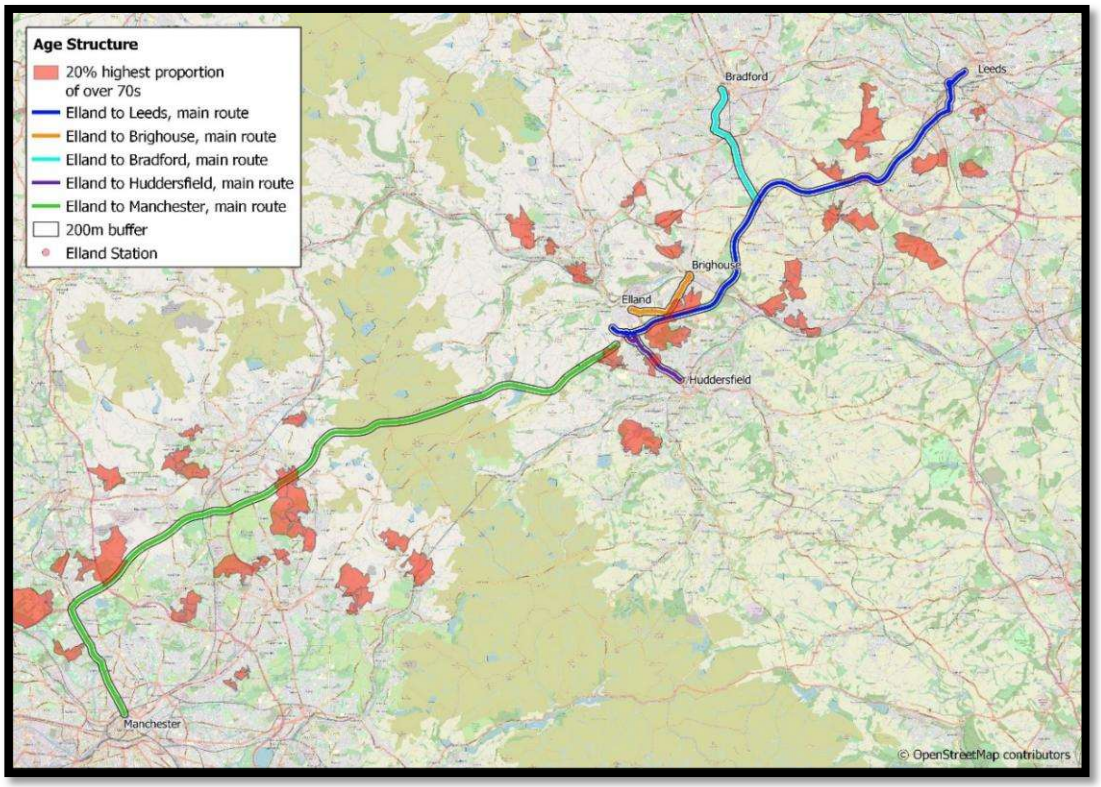



Figure 3 shows there are few areas with the 20% highest proportions of over 70s which are within 200m of the main routes from Elland to surrounding towns and cities. This includes an area just outside the Leeds catchment to the east of New Hey Road, which is the main route to Brighouse and some areas off the M62 route to Manchester. Appendix 31B.1 shows that there are no high proportions of over 70s within the station catchment area, where there will be increased traffic on the local roads. Therefore, the impact on air quality for elderly people is slight beneficial.

*Figure 4 High proportions of children within 200m of main routes to/from Elland*

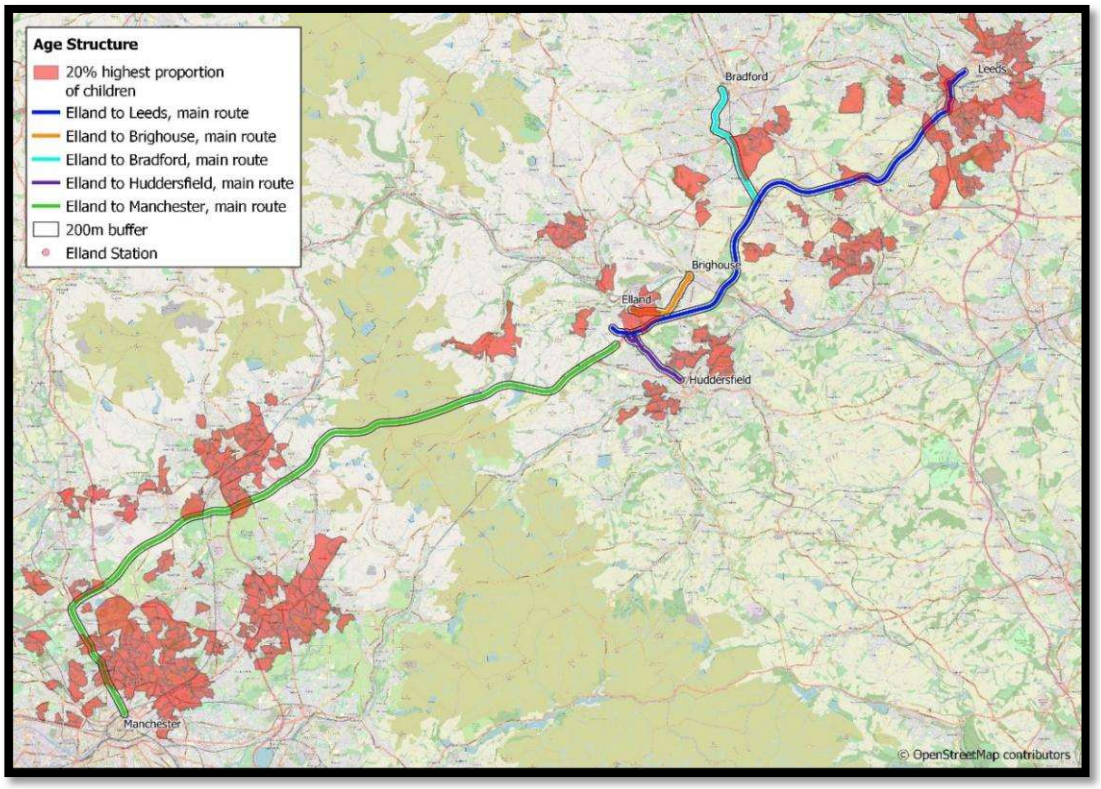



Figure 4 shows that there are high proportions of children to the east of the A56 into Manchester, east of the M606 near Bradford and by the M621 near Leeds, which are all main routes to these cities from Elland. There are also high proportions of children within the station catchment area shown in B.3); to the east of the proposed station location and also to the north of the rail line. Since there will be a beneficial impact for some children and adverse for others, depending on their residence, the overall impact on air quality for children is neutral.

#### 3.5.3.2. Outcome and Qualitative Comment

| Vulnerable group | Outcome |
|---|---|
| Low-income households | 0 |
| Children (under 16) | 0 |
| Older people (over 70) | ✓ |
| **Overall appraisal** | 0 |

The impact on children and low-income households is neutral, as there will be an adverse impact on these vulnerable groups who reside within the station catchment area and a beneficial impact area to those residing close to the main routes from Elland into nearby towns and cities. This is due to an increase in traffic on local roads from vehicles accessing the new station and a reduction in vehicle trips on the main routes due to the modal shift from private car to rail modes of transport. There is a slight beneficial impact on air quality for elderly people since there are high proportions of this group along main routes from Elland to nearby towns and cities, but no high proportions within the catchment area. Therefore, the overall impact of the scheme to air quality is **neutral**.

# 3.6. Noise

## 3.6.1. Screening

There may be an increase in noise levels due to trains stopping/starting at the station instead of travelling straight through. The inclusion of a car park in the station could increase the number of vehicles travelling in the vicinity and hence increase noise levels on the nearby roads. It is expected that the access package scheme will somewhat reduce the proportion of trips to the station made by private car. In addition, the new train station could result in some people changing their transport mode from car to train, which could reduce traffic on the network and therefore may reduce noise. Therefore, we will continue to full DI appraisal.

## 3.6.2. Assessment

### 3.6.2.1. Confirmation of Impact Area

The assessment area for this appraisal has included consideration of changes to noise levels in the vicinity of the new station as well as areas surrounding the main routes from Elland to destination towns and cities which may be impacted due to the modal shift from private car to rail modes of transport making these trips. There have been no noise assessments or analysis on the distribution of traffic flow carried out therefore, this is a qualitative assessment based on the likely impact on air quality

### 3.6.2.2. Step 2b: Identification of Social Groups in Impact Area

| Group | | England | Catchment Area |
|---|---|---|---|
| Children | | 19.0% | 19.8% |
| Income deprivation quintile | 1 – Most deprived | 20.0% | 24.8% |
| | 2 | 20.0% | 29.5% |
| | 3 | 20.0% | 21.4% |
| | 4 | 20.0% | 17.0% |
| | 5 – Least deprived | 20.0% | 7.2% |

### 3.6.2.3. Step 2c: Identification of Amenities in Impact Area

There is a nursery, a Primary and Secondary school all within about 600m of the proposed station, which are all likely to have a high proportion of children. There is a care home about 500m from the proposed station and a hospital roughly 250m away. The main routes from Elland towards Leeds, Bradford and Manchester follow the M62 through rural areas, hence there are few amenities in the vicinity which may attract vulnerable receptors. The main routes to Brighouse follows the A643 which has several amenities such as three schools and five care homes within 200m of the route. The main routes to Huddersfield follows the A629 which has five care homes and a nursery within 200m of the route.

## 3.6.3. Appraisal

### 3.6.3.1. Analysis

The people who are likely to benefit from the scheme, due to reduction in noise levels in the area are those in the vicinity of the main routes linking Elland with destination towns and cities. While there is a disbenefit for those in the direct station area, due to increased travel to and from the station and trains stopping and starting at the station rather than travelling straight through.

The following maps show the 20% highest proportions of vulnerable receptors in the UK overlaid with the main routes from Elland to the surrounding towns and cities which the most people are likely to visit.

*Figure 5 Income structure within 600m of the main routes to/from Elland*

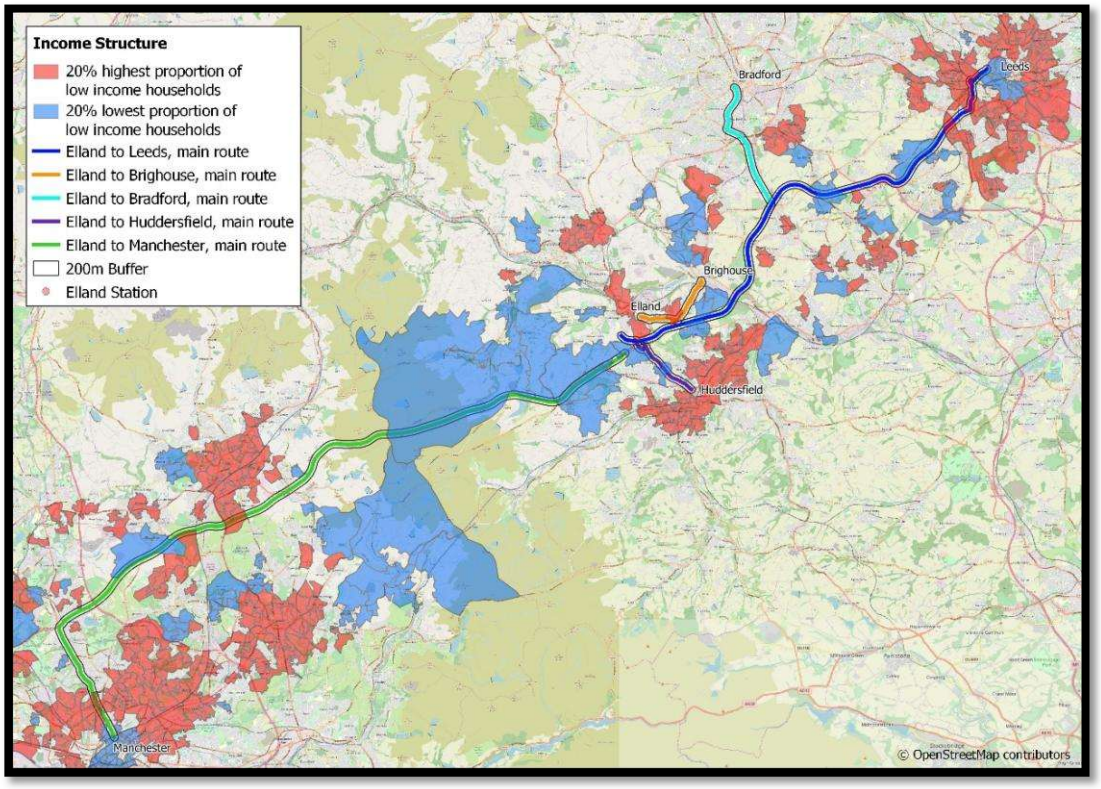



Figure 5 show that there are areas with high proportions of low income households which are within 600m of the main routes to Leeds, Manchester and Huddersfield. Therefore, there could be a beneficial impact on noise levels due to the scheme for these low-income households due to reduced vehicle trips to these places originating in Elland. However, there is also an area in the centre of Elland with high proportions of low-income households. There will be a slight adverse impact on noise levels for residents in this area due to increased vehicle trips to the new station as well as trains stopping and starting at the station. Hence, the overall impact on noise for low-income households is neutral.

*Figure 6 Areas which have high proportions of children close to main routes to major cities*

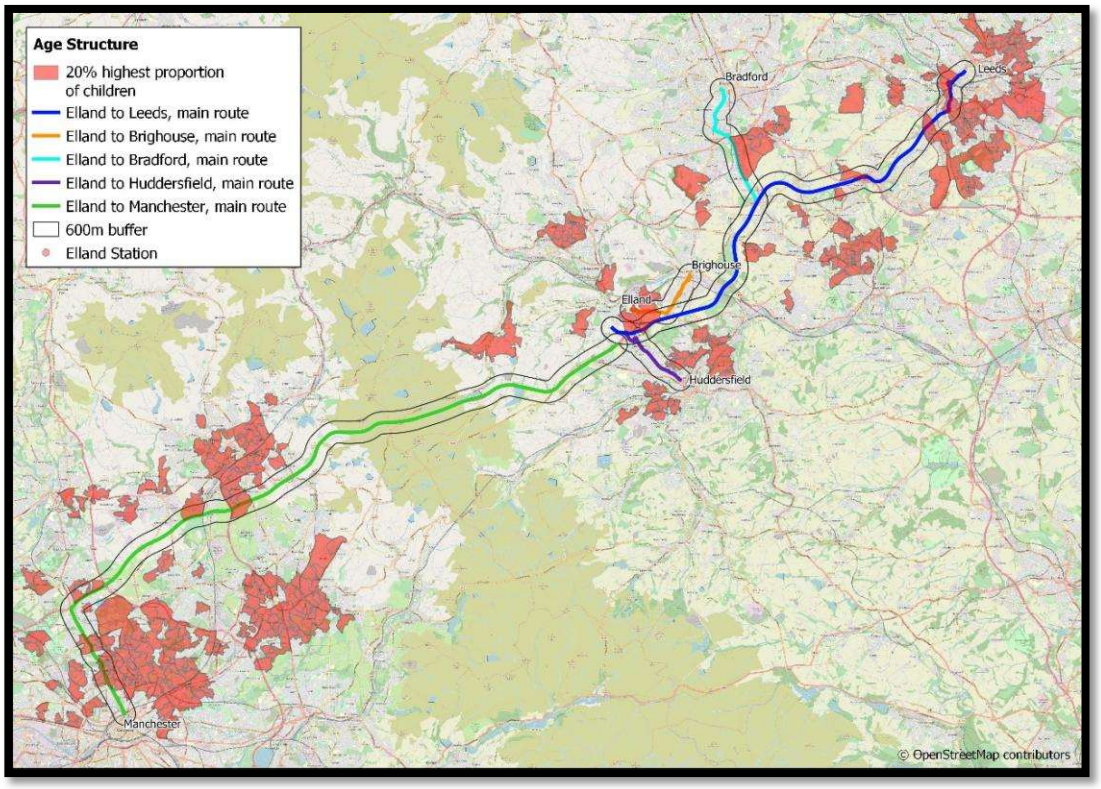



Figure 6 shows that there are high proportions of children to the east of the A56 into Manchester, east of the M606 near Bradford and by the M621 near Leeds, which are all main routes to these cities from Elland. There are also high proportions of children within the station catchment area (as shown in B.3); to the east of the proposed station location and also to the north of the rail line. Since there will be a beneficial impact for some children and adverse for others, depending on their residence, the overall impact on noise for children is neutral.

#### 3.6.3.2. Outcome and Qualitative Comment

*Table 12 Overall appraisal by income quintile*

| Vulnerable group | Overall DI appraisal |
|---|---|
| Low-income households | ***0*** |
| Children (under 16) | ***0*** |
| **Overall appraisal** | ***0*** |

The impact on children and low-income households is neutral, as there could be an adverse impact on these vulnerable groups who reside within the station catchment area and a beneficial impact area to those residing close to the main routes from Elland into nearby towns and cities. This is due to a noise increase because of trains stopping and starting at the station and increased traffic on local roads from vehicles accessing the new station. There will also be a reduction in vehicle trips on the main routes due to the modal shift from private car to rail modes of transport, causing a beneficial impact for vulnerable receptors in the vicinity of these routes. Hence, the overall impact of noise due to the scheme is **neutral**.

# 3.7. User Benefits

## 3.7.1. Screening

An additional train station in the area could reduce door to door journey times for people travelling by public transport. Furthermore, the ease of travelling by public transport to and from Elland could create a modal shift from car to train users, which could consequently reduce congestion and have a beneficial impact upon journey times for car users in the local area. However, the addition of a station could increase traffic flow on the roads in the vicinity, which may increase congestion in the area, having an adverse impact on user benefits. Furthermore it is anticipated that the associated access package scheme Therefore, we will continue to full DI appraisal.

## 3.7.2. Assessment

### 3.7.2.1. Confirmation of Impact Area

This assessment uses abstracted and new journey savings caused by the scheme to calculate the total time savings from the station spreadsheet model. The time benefits are proportioned out using an assumption for each LSOA based on the distance from the station and total population proportion of the LSOA. It is assumed that the proportion of benefits will be higher for those who live closer to the station.

### 3.7.2.2. Step 2b: Identification of Social Groups in Impact Area

| Group | | England | Catchment Area |
|---|---|---|---|
| Income deprivation quintile | 1 – Most deprived | 20.0% | 24.8% |
| | 2 | 20.0% | 29.5% |
| | 3 | 20.0% | 21.4% |
| | 4 | 20.0% | 17.0% |
| | 5 – Least deprived | 20.0% | 7.2% |

### 3.7.2.3. Step 2c: Identification of Amenities in Impact Area

As part of this scheme appraisal for user benefits it is noted that there are few opportunities for employment within the study area, however, there is an industrial estate and retail employment opportunities within the town centre. There are also high proportions of job seekers allowance claimants surrounding the proposed station location who may be impacted by the addition of a station through increased connectivity to employment opportunities in surrounding towns and cities.

## 3.7.3. Appraisal

### 3.7.3.1. Analysis

The assumption for the distribution of benefits is summarised in the table below:

*Table 13 Assumptions used for the distribution of user benefits*

| Distance from Elland Station | Proportion of total benefit |
|---|---|
| <800m | 40% |
| <1600m | 30% |
| <2400m | 20% |
| <5000m | 10% |

*Figure 7 Shows the income quintiles, the station catchment area and the distance buffers used to calculate the user benefits as part of the scheme*

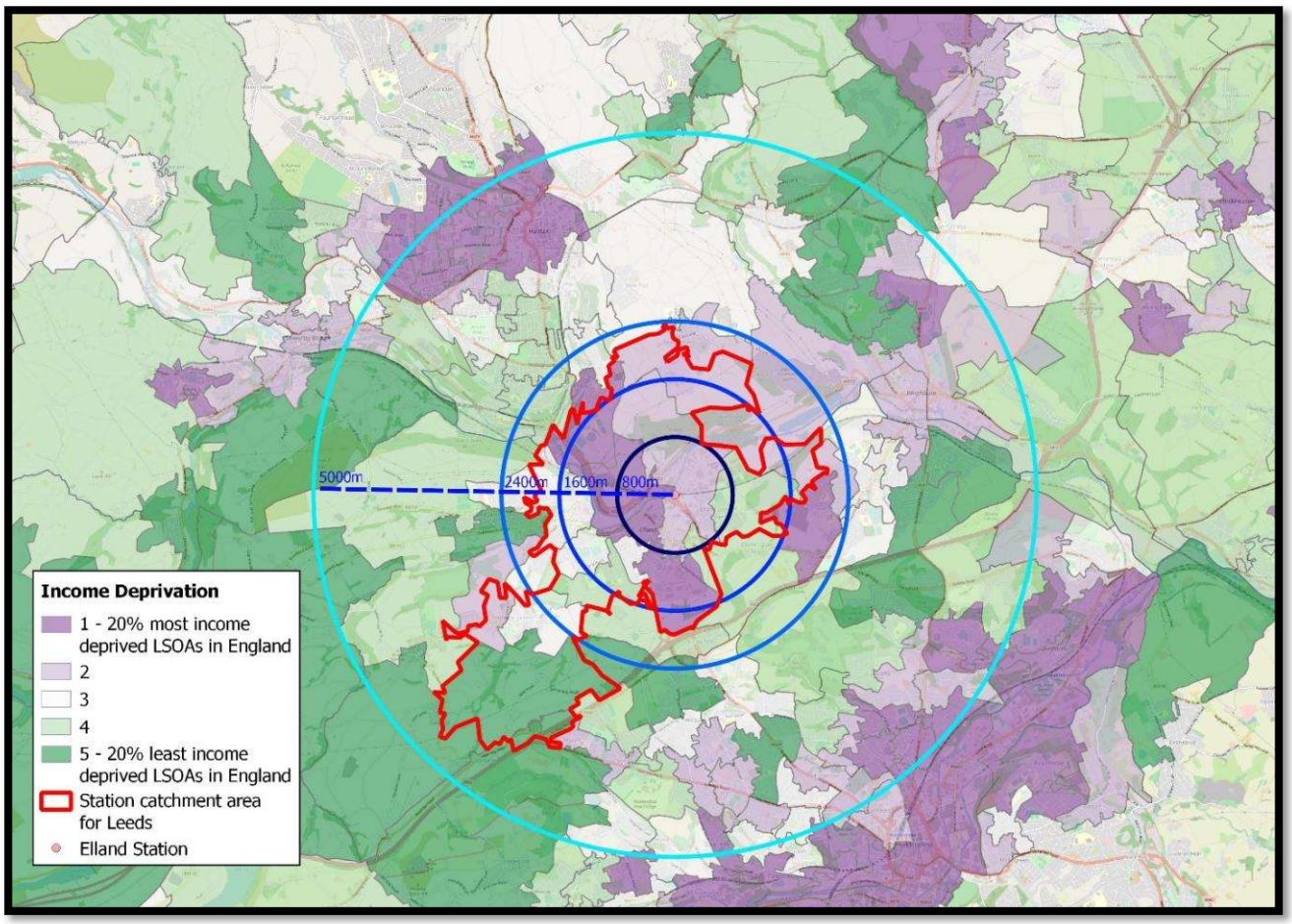


*Table 14 Distribution of journey time benefits by income quintile*

| | Income Quintile | | | | | Total |
|---|---|---|---|---|---|---|
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| Total population within the catchment area | 5503 | 6541 | 4746 | 3761 | 1604 | 22155 |
| Proportion of overall population within the catchment area | 24.8% | 29.5% | 21.4% | 17.0% | 7.2% | 100.0% |
| Distribution of the benefits | 32.9% | 34.1% | 15.7% | 12.2% | 5.0% | 100.0% |
| Overall journey time benefits for new and abstracted journeys | 722196 | 749408 | 345590 | 268913 | 109400 | 2195507 |
| Assessment | ✓✓✓ | ✓✓ | ✓ | ✓✓ | ✓✓ | ✓✓ |

***Key to individual assessment of each Income quintile***

| | |
|---|---|
| A benefit which is 5% greater (or more) than the proportion of the group in the total population | Large Beneficial |
| Beneficial and in line (+/-5%) with the proportion of the group in the total population | Moderate Beneficial |
| Beneficial and 5% smaller (or less) than the proportion of the group in the total population | Slight Beneficial |
| There are no user benefits or disbenefits experienced by the group | Neutral |
| A disbenefit which is 5% smaller (or less) than the proportion of the group in the total population | Slight Adverse |
| A disbenefit which is in line (+/-5%) with the proportion of the group in the total population | Moderate Adverse |
| A disbenefit which is 5% greater (or more) than the proportion of the group in the total population | Large Adverse |

### 3.7.3.2. Outcome and Qualitative Comment

The traffic on local roads is expected to increase due to private car trips being made to access the new station, which may increase journey times in the centre of Elland. However, part of the scheme package includes improvements to encourage walking and cycling within Elland, which may reduce traffic on local roads. Direct train access from Elland to major cities and towns in the north is likely

to create user benefits, which outweigh any disbenefits of increased traffic around the station, for those that live within Elland by reducing journey times for those routes. There are areas with high income deprivation in close proximity of the proposed station location, who may particularly benefit from the scheme.

The scheme has a large beneficial impact for quintile 1, moderate beneficial impact for quintiles 2, 4 and 5, a slight beneficial impact for quintile 3. Since quintiles 1 and 2 (most income deprived in the UK) represent 54.4% of the population in the catchment area, the overall impact on user benefits is **moderate beneficial**.

# 3.8. Affordability

## 3.8.1. Screening

The fare structures are believed to be in line with Northern rails current fare structure and the car parking charges are expected to be free. The pricing of both the services and parking provision will have an affordability impact on users / potential users. In addition, any reduction in congestion noted as a result of mode shift from car to rail could lead to a reduction in vehicle operating costs for road users, which could also have an impact on affordability. Conversely, if there is an increase in traffic in the local area as a result of users accessing the new station this may also impact vehicle operating costs. Therefore, we will continue to full DI appraisal.

## 3.8.2. Assessment

### 3.8.2.1. Confirmation of Impact Area

This personal affordability assessment has included consideration to the proposed fare structure for the new Elland station to key destination towns and cities. The difference in travel costs between bus, private car and rail have been considered to take into account any modal shift due to the scheme.

### 3.8.2.2. Step 2b: Identification of Social Groups in Impact Area

*Table 15 Proportions of income groups within the catchment area*

| Income Group | | England | Catchment Area |
|---|---|---|---|
| Income deprivation quintile | 1 – Most deprived | 20.0% | 24.8% |
| | 2 | 20.0% | 29.5% |
| | 3 | 20.0% | 21.4% |
| | 4 | 20.0% | 17.0% |
| | 5 – Least deprived | 20.0% | 7.2% |

### 3.8.2.3. Step 2c: Identification of Amenities in Impact Area

The area has a large low-income population, with 54.4% of the population in the lowest two income quintiles. These households may not be able to afford a car and may rely on public transport to access key amenities not available in Elland.

## 3.8.3. Appraisal

### 3.8.3.1. Analysis

The average return transport fares, originating from Elland, to key destination towns and cities is shown in the table below:

*Table 16 Average costs for to key destinations from Elland by different methods*

| Station Name | Transport Fares (£) | | | |
|---|---|---|---|---|
| | Bus +Rail | Private Car | Rail (Open Return) | Rail (Railcard) |
| Leeds | 4.5 + 9.20 | 19.74 | 17.38 | 11.50 |
| Bradford | 4.5 + 4.30 | 16.47 | 10.65 | 7.02 |
| Huddersfield | 4.5 (just Bus) | 13.32 | 6.02 | 3.97 |
| Brighouse | 4.5 (just bus) | 12.58 | 2.73 | 1.81 |
| Manchester | 4.5 + 20.70 | 22.50 | 12.10 | 7.99 |

The standard anytime return rail fare and standard return fare for a railcard holder has been calculated using the average fare from Elland to each destination station, which averages all fares, for example, standard, concession and season tickets. A comparison of the average charge with a standard return charge from Sowerby Bridge (closest station to Elland) to each destination station was used to determine the proportion of this average made up from return fares. This was then used to calculate a standard return fare from Elland to each of the destination stations. Since no data is available on the average fare from Elland to Manchester, it has been assumed that the charges will be the same as Sowerby Bridge to Manchester stations. The bus fare has been calculated from an average return bus ticket[1] to key destinations with a railway station.

The private car fares have been calculated based on fuel and other car running costs for an average car. The quickest route according to Google Maps has been used to determine the distance and average speed of each journey. The vehicle operating costs (fuel and non-fuel) have been calculated in line with values from the latest release of the WebTAG data book. A cost of £11 has been added to the fuel and vehicle operating costs to take into account the price of buy a car. This has been calculated by taking the average price of a car[2] with a 60% depreciation[3] distributed over 3 years and 365 days.

The results in Table 16 show direct rail travel is one of the most affordable ways to travel. This is particularly beneficial for low income groups who will have an additional affordable way to travel. There is also a high proportion of no car households to the south of the proposed station location. Rail may be more affordable for this group due as they may not have the access or income to afford a private car. Furthermore, when using a car, it is likely that there will be car parking at destinations that need to be added to the overall cost and the calculation does not include the cost of buying/leasing a car and paying for insurance.

The station will follow Northern Rails fare structures and there will be the opportunity for concessionary rail cards, which allow for cheaper fares. Rail is likely to be an attractive option for those in the most income deprived areas, who are less likely to have a car and have access to concessionary railcards. Over 54% of the population living within the Elland catchment area are within the two most income deprived quintiles and therefore, adding another viable transport option to major cities which is of comparable cost to other modes of transport.

[1] https://www.yorkshiretiger.co.uk/

[2] http://cardealermagazine.co.uk/publish/average-new-car-price-risen-38-per-cent-past-decade-says-cap-hpi/146938)

[3] https://goodcalculators.com/car-depreciation-calculator/

#### 3.8.3.2. Outcome and Qualitative Comment

Whilst there will still be an option to travel either by Bus or Car, there is an additional option for travelling by rail for those living in Elland. The price of travelling the cities such as Leeds and Manchester for those who do not have access to a car is likely to reduce as they will not have to pay the fare of a bus in order to get to a train station in another town. Therefore, the option of travelling by train straight from Elland is cheaper, even with bus and train concession fares.

Furthermore, for those who do have access to a car, there will be free parking at the rail station and if there is any cost for paying at parking when driving this has to be added onto the journey.

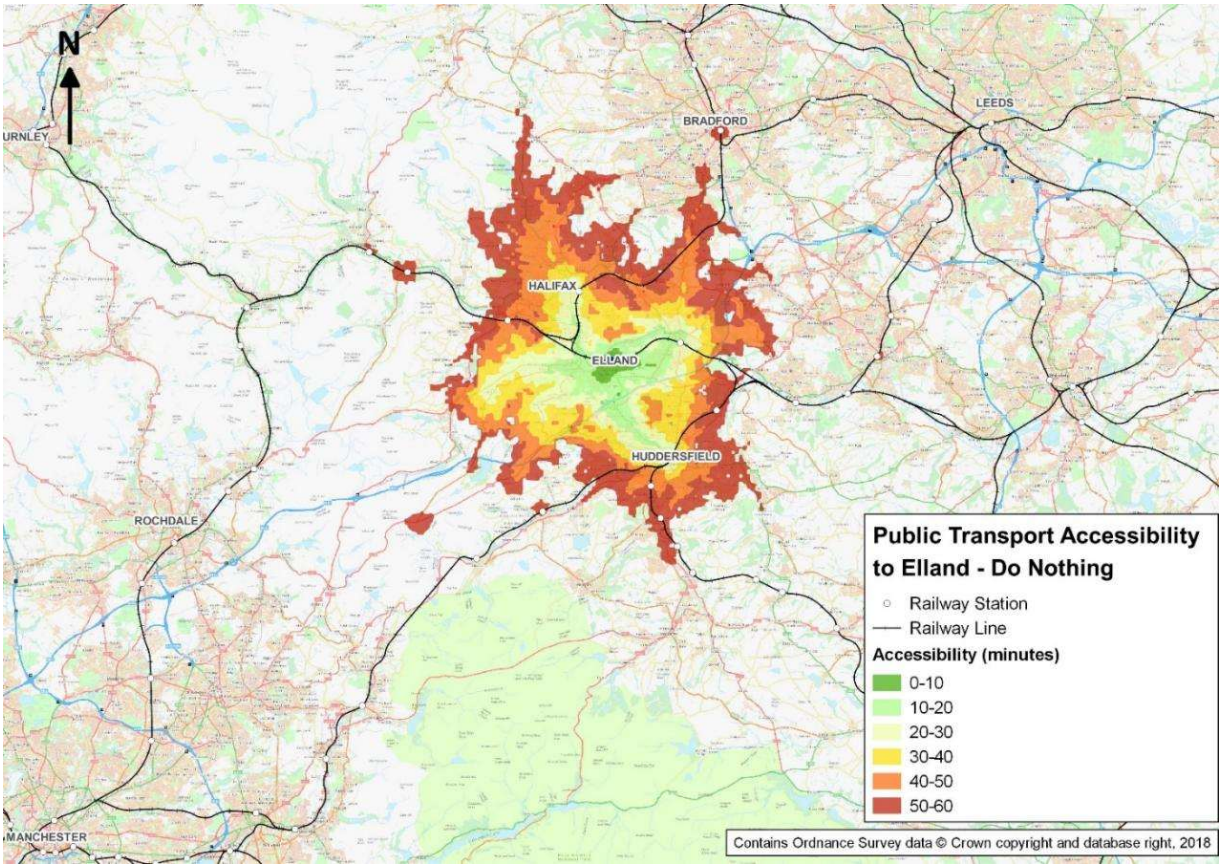
Overall, the cost of travelling by train is comparably affordable option. Furthermore, the additional cost of parking when driving versus no cost to park at Elland Railway station allow for those areas which are the most income deprived to have another affordable option to get to major employment centres and those with better health care and retail facilities. Therefore, the overall impact is **moderate beneficial**.

# 4. Overall Summary

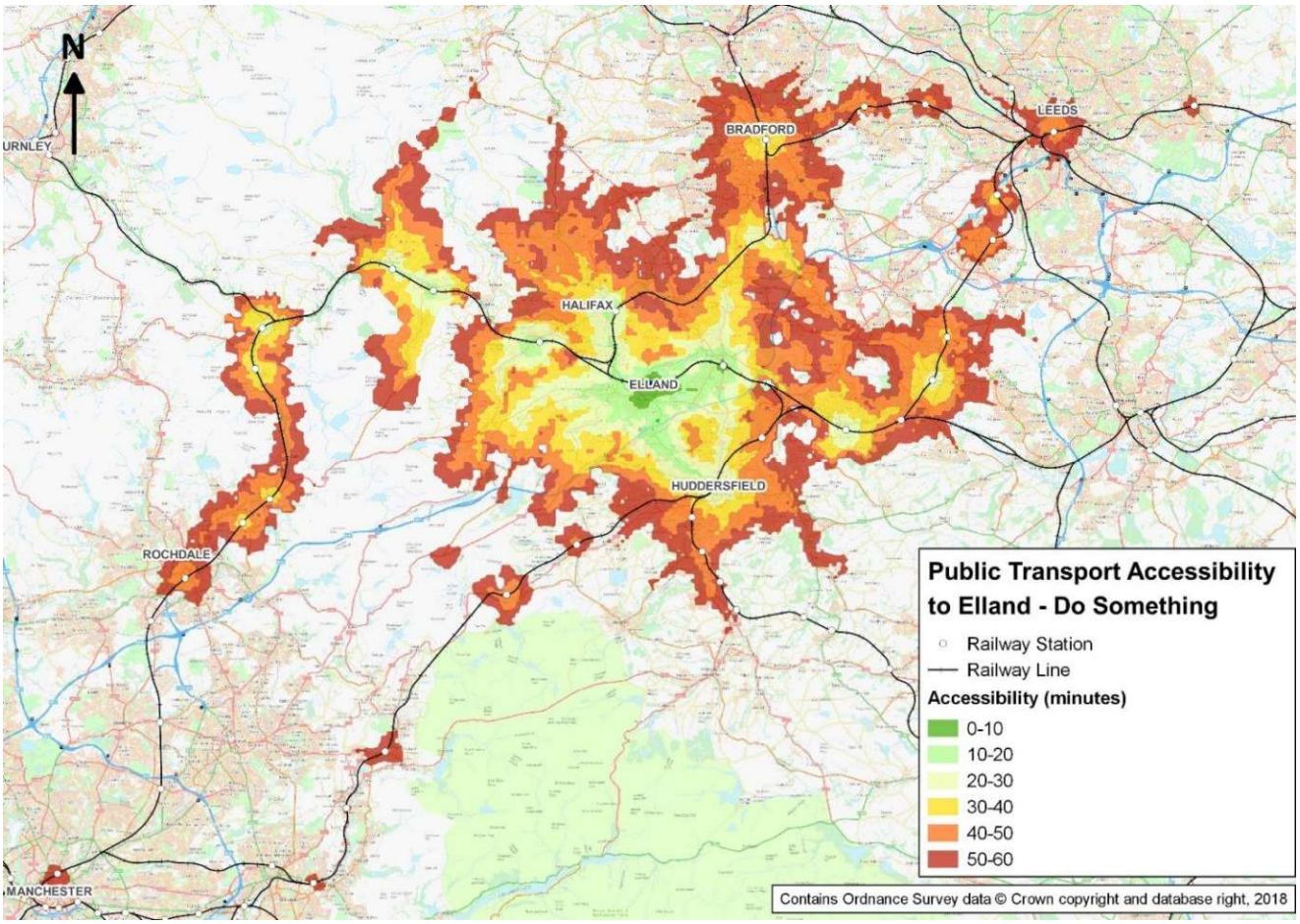
| Indicator | Appraisal |
|---|---|
| **Accessibility** | Large Beneficial |
| **Accidents** | Neutral |
| **Severance** | Neutral |
| **Security** | Slight Beneficial |
| **Air Quality** | Neutral |
| **Noise** | Neutral |
| **Affordability** | Moderate Beneficial |
| **User Benefits** | Moderate Beneficial |

# A.1. Accessibility to Elland

## A.1.1. Without Elland Station Scheme

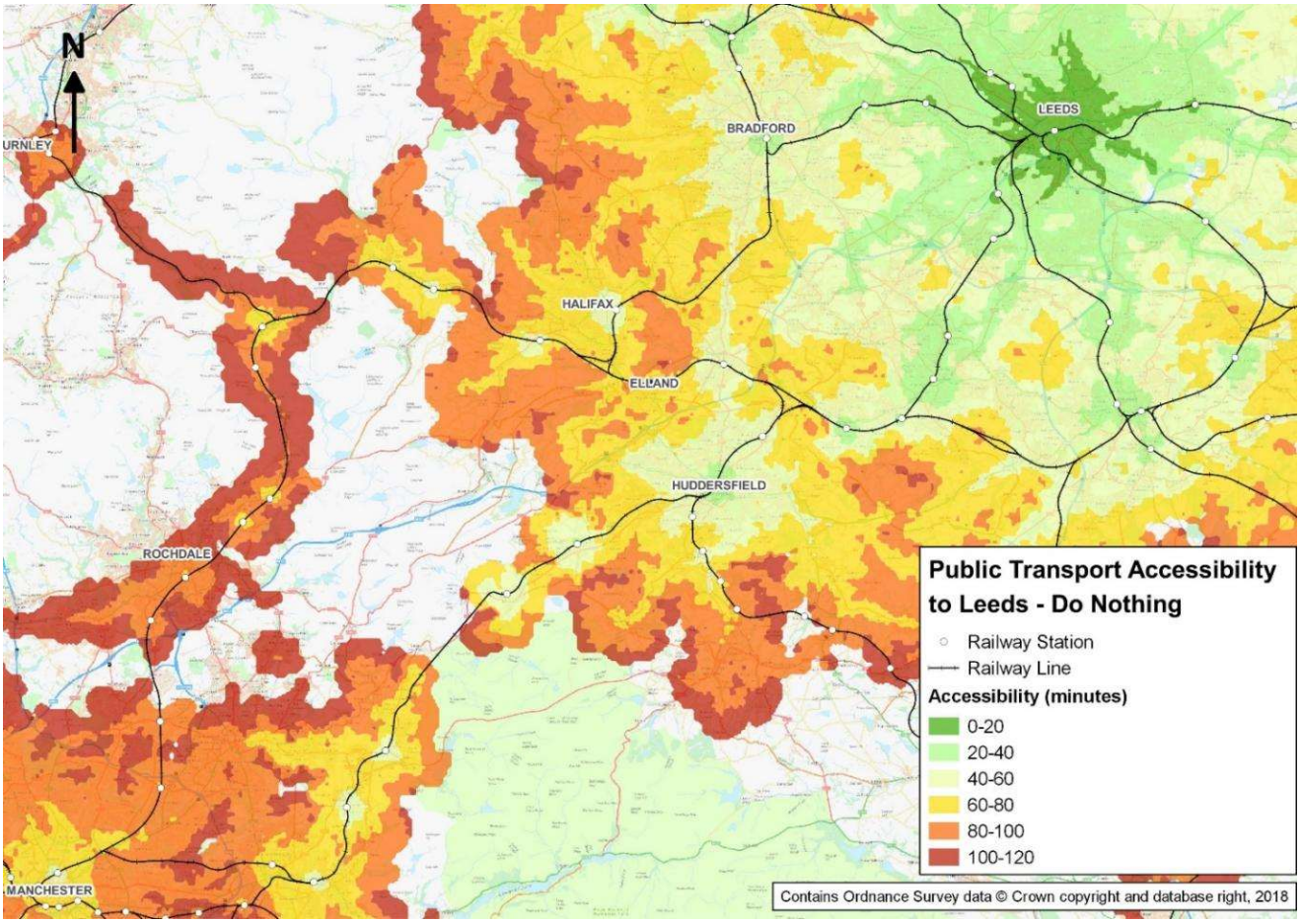


## A.1.2. With Elland Station Scheme

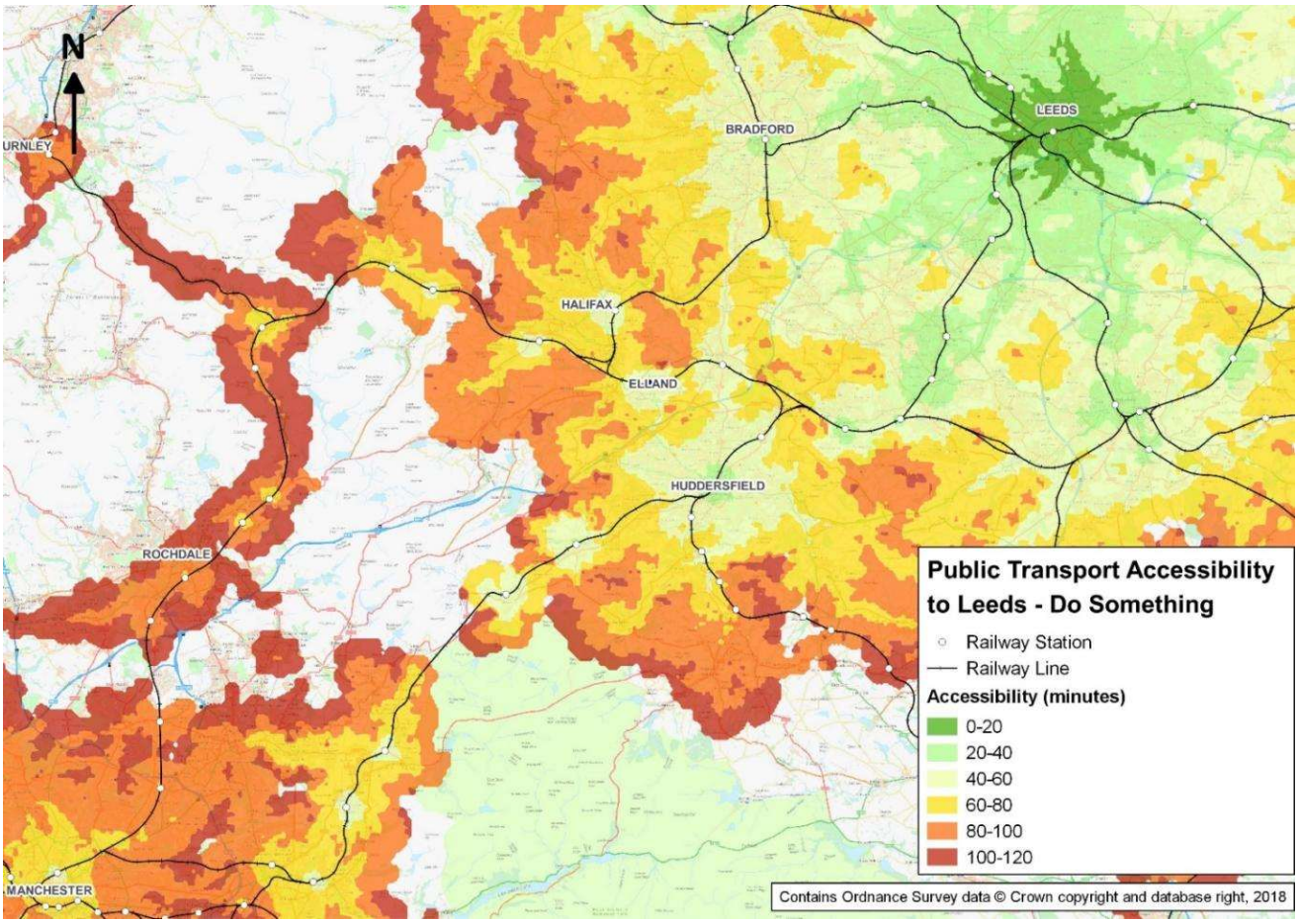


# A.2. Accessibility to Leeds City Centre

## A.2.1. Without Elland Station Scheme



### A.2.2. With Elland Station Scheme



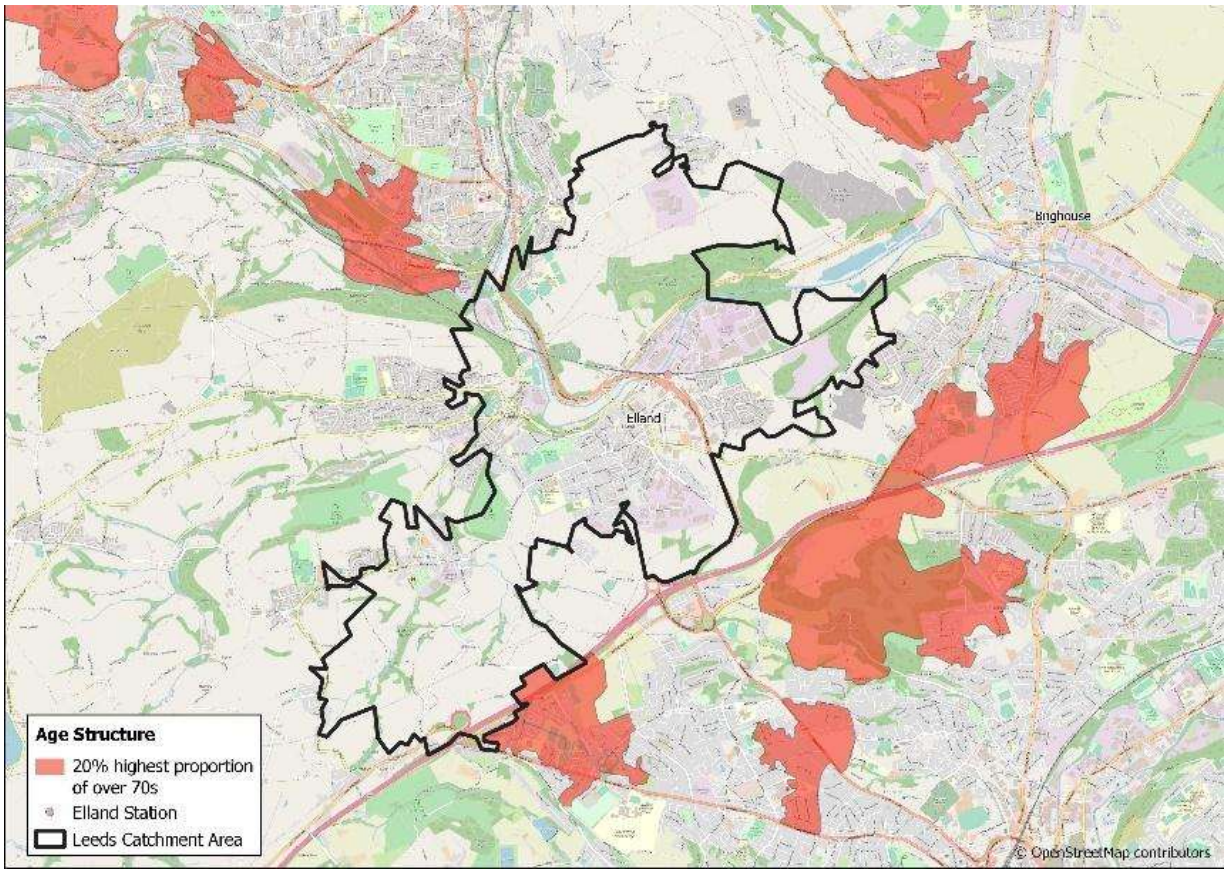

## A.3. Accessibility Analysis

The table below shows the improvements in accessibility between the 'without scheme' and 'with scheme' scenarios for both car households and no-car households.

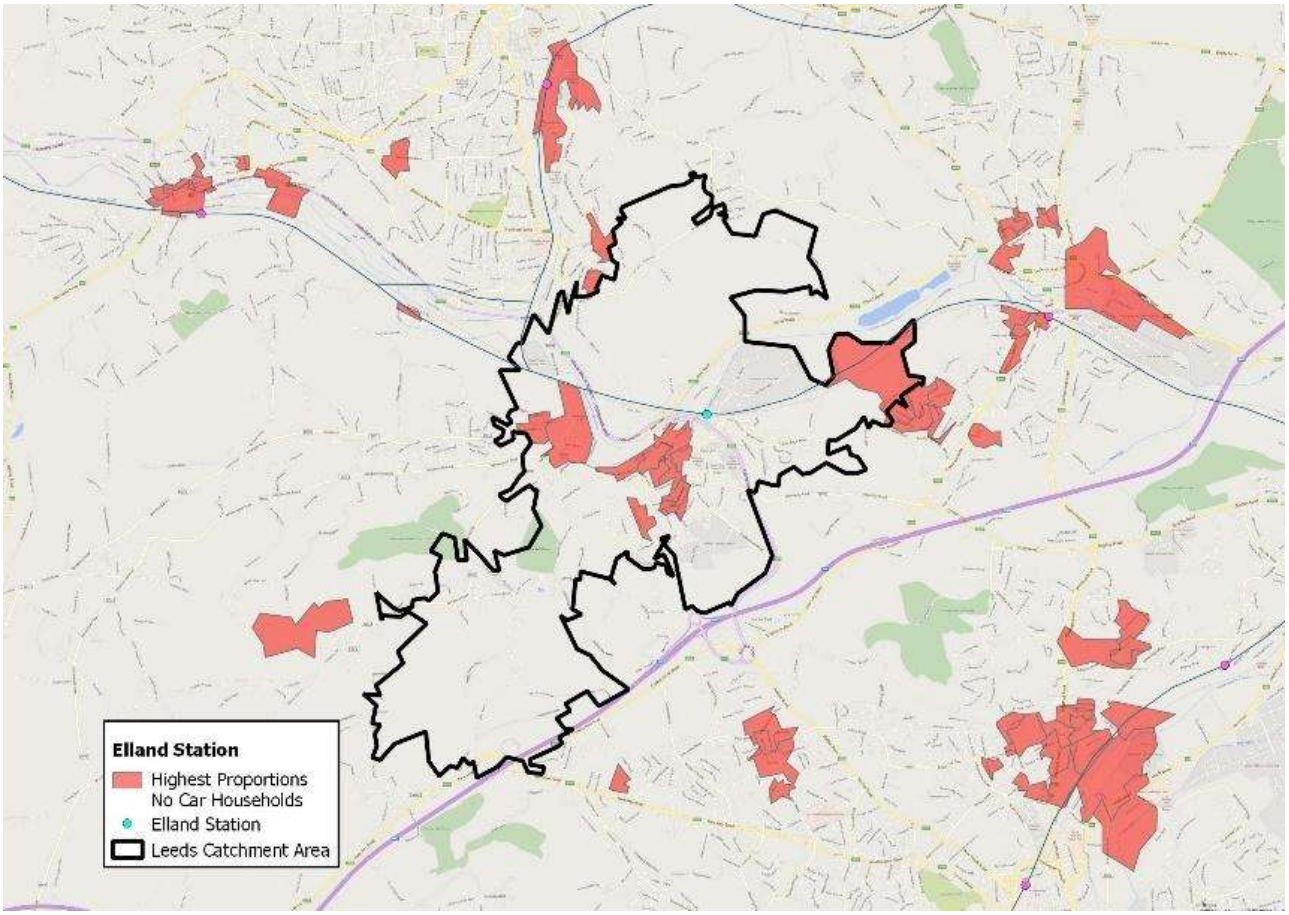
| Public transport accessibility of the population in the impact area to Leeds City Centre | Without Scheme | | With Scheme | |
|---|---|---|---|---|
| | **Car Households** | **No Car Households** | **Car Households** | **No Car Households** |
| 0-10 mins | 0 | 0 | 0 | 0 |
| 11-20 mins | 0 | 0 | 0 | 0 |
| 21-30 mins | 0 | 0 | 0 | 0 |
| 31-40 mins | 0 | 0 | 0 | 0 |
| 41-50 mins | 0 | 0 | 261 | 161 |
| 51-60 mins | 0 | 0 | 1987 | 913 |
| 61-70 mins | 569 | 485 | 974 | 446 |
| 71-80 mins | 3768 | 1298 | 1325 | 301 |

| | | | | |
|---|---|---|---|---|
| 81-90 mins | 210 | 38 | 0 | 0 |
| 91-100 mins | 133 | 12 | 133 | 12 |
| 101-110 mins | 0 | 0 | 0 | 0 |
| 111-120 mins | 0 | 0 | 0 | 0 |
| **Total households within 60 mins** | **0** | **0** | **2248** | **1074** |
| **Total households within 120 mins** | **4680** | **1833** | **2432** | **759** |

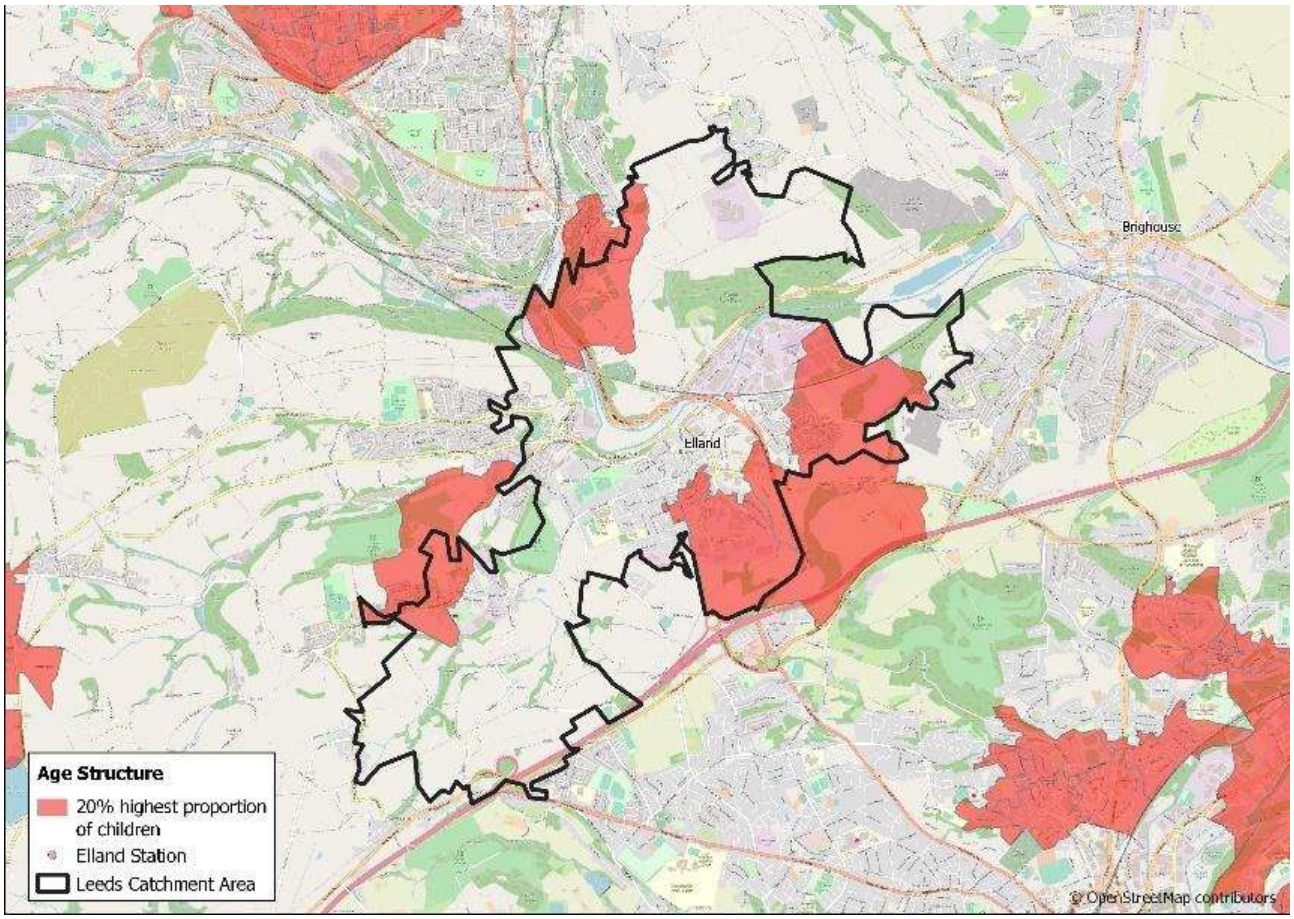
## B.1. Map showing the LSOAs which have a proportion of Over 70 years old within the highest 20% Nationally and the catchment area of the station.



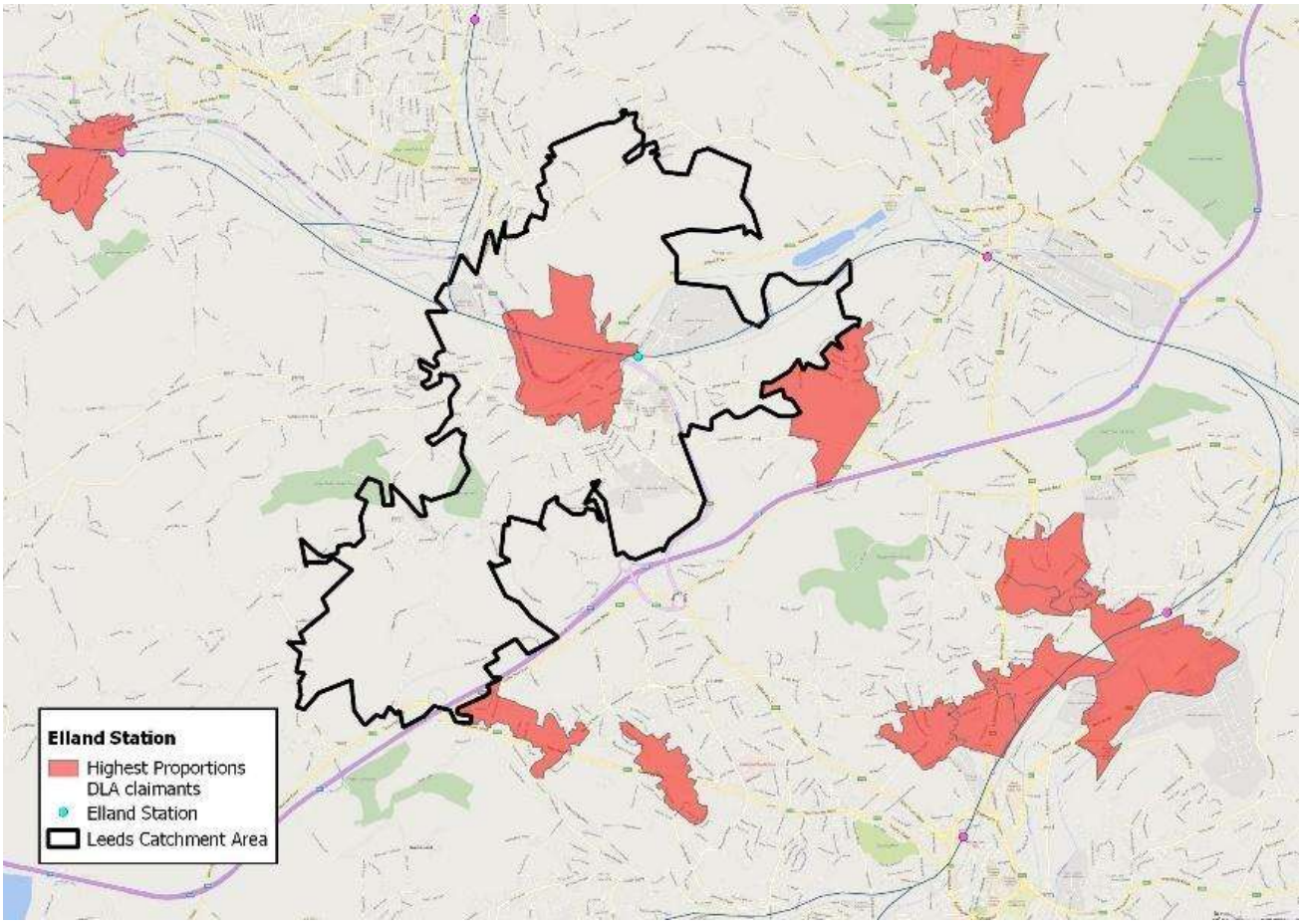
## B.2. Map showing the LSOAs which have a proportion of No Car Households within the highest 20% Nationally.



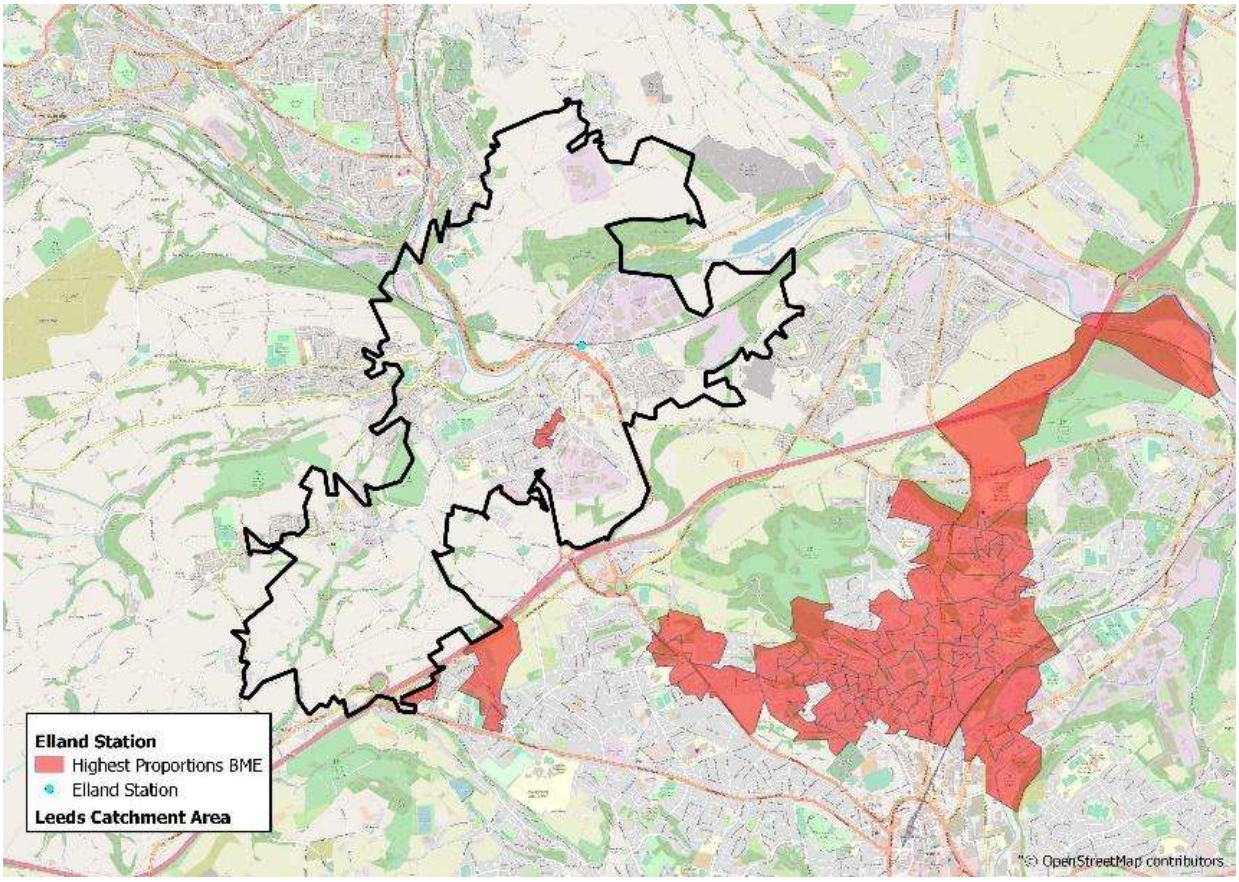
## B.3. Map showing the LSOAs which have a proportion of Children (under 16 years old) within the highest 20% Nationally.



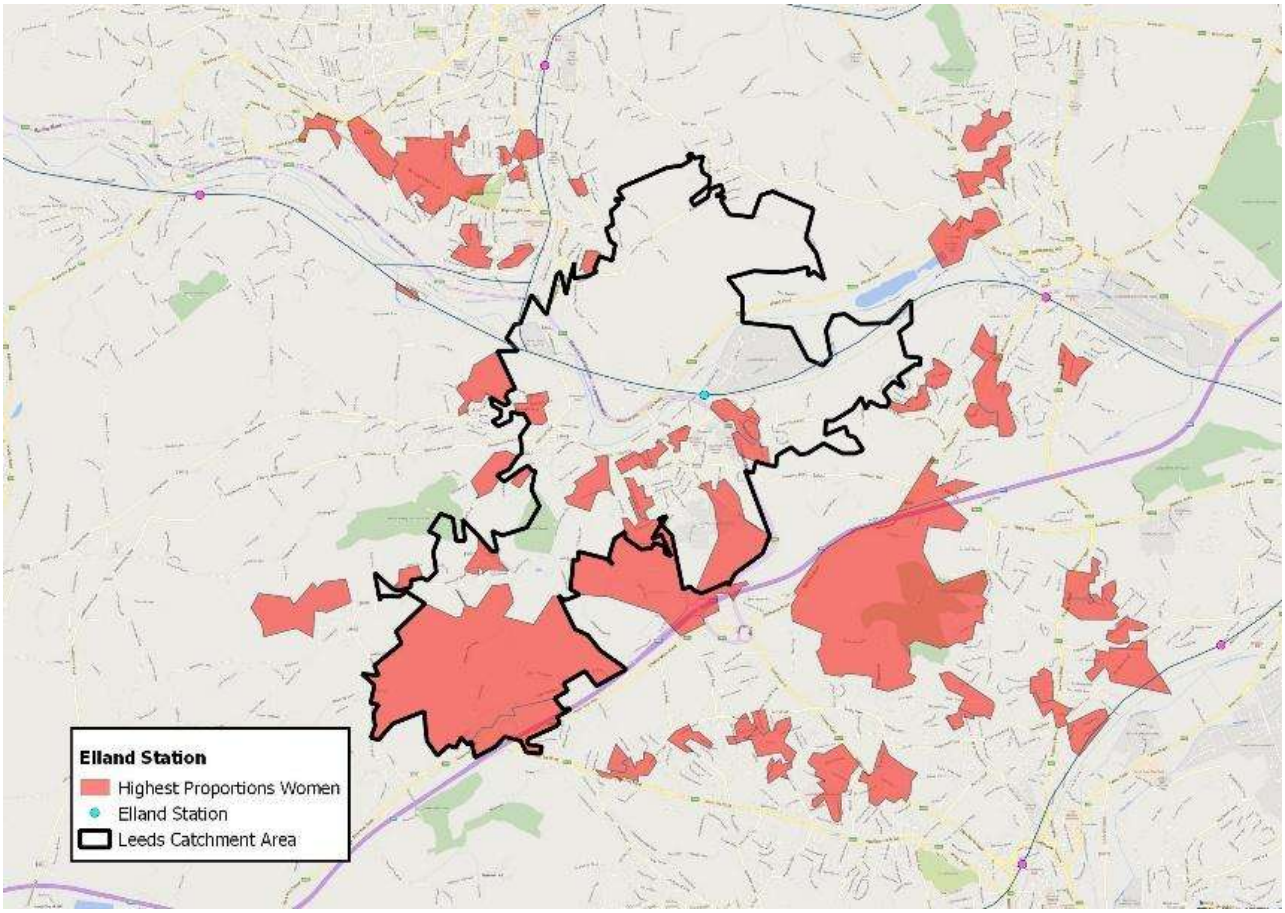
## B.4. Map showing the LSOAs which have a proportion of Disability Living Allowance Claimants within the highest 20% Nationally.



## B.5. Map showing the LSOAs which have a Black and Minority Ethnic population within the highest 20% Nationally.



## B.6. Map showing the OAs which have a proportion of Women within the highest 20% Nationally.



## B.7. Map showing the LSOAs which are the most income deprived, and least income deprived within the highest 20% Nationally.