A30 Chiverton to Carland Cross

Distributional Impact Appraisal Report

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Foreword

This document supports the Appraisal Summary Table (AST) for the A30 Chiverton to Carland Cross scheme. The purpose of the AST is to provide a concise, across-the-board overview of the impacts of the scheme, taking account of all the economic, social, environmental and financial impacts as set out in HM Treasury's Green Book[1]. From PCF Stage 2 onwards, a Distributional Impacts Appraisal Report and Matrix is required to support the AST product.

The purpose of this Distributional Impacts (DI) Appraisal Report is to determine any differences in potential impacts of the scheme across social groups, with particular reference to the impact upon equality through identifying the effects upon vulnerable or disadvantaged groups (as compared to the population as a whole). The report presents the evidence base that informs the Distributional Impacts Appraisal Matrix and is used to populate the column in the AST relating to the impact on vulnerable groups.

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[1] HM Treasury (2018) The Green Book: Central Government Guidance on Appraisal and Evaluation

Executive Summary

This DI Appraisal Report considers the variance of the impacts of the A30 Chiverton to Carland Cross scheme across different social groups. It forms part of the PCF product specification for the Appraisal Summary Table and has been undertaken in accordance with:

- DfT WebTAG Unit A4.2[2]; and,
- Supplementary Highways England guidance[3].

Table 1-1 below – the DI appraisal matrix – forms the main output of the DI appraisal. Different indicators should not be compared directly, as each indicator relies on different scales (as defined by the above guidance). However, the matrix provides an overview of the expected 'winners' and 'losers' from the scheme and highlights key issues of relevance.

Of the eight impacts, major schemes are always assumed to impact upon User Benefits, Noise, Air Quality, Accidents and Affordability. They may have an impact upon Severance, but should never have anything other than, at most, a negligible impact upon Security and Accessibility[4].

As the DI appraisal matrix shows, the scheme is forecast to have negligible impacts on Security, Severance and Accessibility. These elements are not expected to impact significantly on any particular vulnerable group and have therefore not been fully assessed.

The assessment has shown that the transport user benefits from the scheme are overall beneficial. The scheme is expected to provide the most deprived group (in income terms) with a high share of user benefits relative to its share of the population.

There is an overall increase in households experiencing noise but reductions in the number of households experiencing noise in the high bands. Impacts are not distributed evenly between the income groups. One income group has a large beneficial impact, while the other has a large adverse. On balance, the scheme is assessed as having a Slight Beneficial noise impact.

The assessment shows that air quality impacts of the scheme are overall beneficial. The majority of income groups identified within the impact area benefit and therefore the scheme is assessed as Moderate Beneficial in terms of air quality impact.

Overall, the scheme is shown to have a neutral impact on accidents for the most vulnerable social groups, with a slight beneficial impact for older people.

In terms of personal affordability (i.e. vehicle operating costs), the scheme has an overall moderate adverse disbenefit. This is likely due to the increased speeds on the proposed road leading to increased vehicle operating costs and an increase in the overall distance travelled on the network with the scheme in place. The disbenefits do not however disproportionately affect any income group.

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[2] Department for Transport (DfT) TAG UNIT A4.2. Distributional Impact Appraisal. December 2015

[3] Supplementary guidance contained within the document *DI Appraisal and HE Major Schemes V6d*

[4] DI Appraisal and HE Major Schemes V6d. p.3

Table 1-1 DI Appraisal Matrix

	Distributional impact of income deprivation					Are the impacts distributed evenly?	Key impacts - Qualitative statements
	0-20%	20-40%	40-60%	60-80%	80-100%		
User benefits	✓✓	✓✓	✓✓✓	✓✓	✓✓	No	Given the proportionate spread of benefits, which is broadly representative of the population, the scheme is assessed as overall moderate beneficial in terms of the distribution of user benefits.
Noise	Neutral	Neutral	✓✓✓	✗✗✗	Neutral	No	The scheme is assessed as having a slight beneficial noise impact, given that the large beneficial impact for the more deprived income group (40%-<60%) outweighs the adverse impact for the other income group (60%-<80%) which only makes up 10% of the population within the study area.
Air quality	✗✗✗	✓✓✓	✓✓	✓✓✓	Neutral	No	Overall, in terms of air quality impact, the scheme is assessed as Moderate Beneficial. Air quality impacts disbenefit the most deprived (0-<20%) income group with the percentage of net losers outweighing the income group's share of the total population within the air quality study area.
Affordability	✗✗	✗✗	✗✗	✗✗	✗✗	Yes	The scheme increases speed along the route and in turn the vehicle operating costs have increased in the study area. The assessment shows that the scheme has an overall moderate adverse effect on affordability.
Accessibility							Screened out. The scheme does not provide any significant accessibility benefits impacts.

AST entry

Impact	Social groups						User groups				Qualitative statement
	Children & young people	Older people	Carers	Women	Disabled	BME	Pedestrians	Cyclists	Motor-cyclists	Young male drivers	
Noise	Neutral	Neutral									
Air Quality	Neutral										
Accidents	Neutral	Slight Beneficial (✓)					Neutral	Neutral	Neutral	Neutral	
Security	Neutral	Neutral		Neutral	Neutral	Neutral					
Severance	Neutral	Neutral	Neutral		Neutral						
Accessibility	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral					

1   Introduction

1.1   The scheme

1.1.1   The section of the A30 in Cornwall between Carland and Chiverton Cross, north of Truro, is currently a winding single carriageway route and is the only single carriageway section of the A30 route between the M5 at Exeter and Camborne.

1.1.2   Due to the low standard of the route, this section of the A30 experiences congestion and delays throughout the year, with poor journey time reliability. These problems are exacerbated in summer months, when traffic flows increase due to tourist traffic. The route is in need of improvement to meet Highways England's objectives of maintaining the smooth flow of traffic, making the network safer and supporting economic growth. The desire for improvements to this route is strongly supported by local and regional strategies from Cornwall Council, the Cornwall and Isles of Scilly Local Enterprise Partnership, businesses and local stakeholders.

1.2   Objectives

1.2.1   The scheme will:

- contribute to economic growth by supporting employment and residential development opportunities;
- contribute to regeneration by enhancing the opportunities for previous, existing and future regeneration projects to realise their full potential; and
- minimise the environmental impact of operating, maintaining and improving the network and seek to protect and enhance the quality of its surrounding environment while conforming to the principles of sustainable transport.

Scheme objectives

- Improve the safety, operation and efficiency of the transport network;
- Contribute to regeneration and sustainable economic growth;
- Support employment & residential development opportunities;
- Improve network reliability and reduce journey times;
- Deliver capacity enhancements to the Strategic Road Network (SRN);
- Support the use of sustainable modes of transport;
- Deliver better environmental outcomes; and
- Improve local and strategic connectivity.

1.3   Purpose of this report

1.3.1   The purpose of distributional impact (DI) appraisal is to determine any differences in impacts of a transport intervention across different social groups, with particular reference to the impact upon equality through identifying the effects upon those who are disadvantaged compared to the population as a whole.

1.3.2   This report describes the approach undertaken for the full appraisal of DIs for the proposed A30 Chiverton to Carland Cross scheme and forms part of the Appraisal Summary Table (AST) PCF product.

1.3.3   This DI appraisal has been undertaken in accordance with:

- DfT WebTAG Unit A4.2[5]; and,
- Supplementary Highways England guidance[6].

1.3.4 This report sets out the appraisal process that has been undertaken for each of the following impact areas, as set out in WebTAG:

- User benefits;
- Noise;
- Air Quality;
- Affordability;
- Accidents;
- Security;
- Severance; and
- Accessibility.

1.3.5 Some impacts are, for analysis purposes, specific to certain social groups. Table 2 from WebTAG Unit A4.2[7] shows which impact should be assessed for each group and is replicated below.

Table 1-2 Scope of Socio-Demographic Analyses for DIs (WebTAG Unit A4.2)

Dataset/ social group (Tick indicate analysis required for each impact)	User benefits	Noise	Air-quality	Accidents	Security	Severance	Accessibility	Affordability
Income Distribution	✓	✓	✓				✓	✓
Children: proportion of population aged <16		✓	✓	✓	✓	✓	✓	
Young adults: proportion of population aged 16-25				✓			✓	
Older people: proportion of population aged 70+		✓		✓	✓	✓	✓	
Proportion of population with disability					✓	✓	✓	
Proportion of population of Black and Minority Ethnic (BME) origin					✓		✓	
Proportion of households without access to a car						✓	✓	
Carers: proportion of household with dependent children							✓	

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[5] Department for Transport (DfT) TAG UNIT A4.2. *Distributional Impact Appraisal. December* 2015

[6] Supplementary guidance contained within the document *DI Appraisal and HE Major Schemes V6d*

[7] DfT, TAG UNIT A4.2. Table 2. pp.3-4

1.3.6   Each impact has been assessed through the following steps:

- **Step 1** – Screening Process;
- **Step 2** – Assessment; and
- **Step 3** – Appraisal of Impacts.

1.3.7   Chapter 2 of this report outlines the assessment steps undertaken for each impact. The chapters following this describe the separate analysis undertaken for each impact. The report follows the following structure:

- **Chapter 2** – Methodology
- **Chapter 3** – User Benefits
- Chapter 4 – Noise
- **Chapter 5** – Air Quality
- **Chapter 6** – Accidents
- **Chapter 7** – Security
- **Chapter 8** – Severance
- **Chapter 9** – Accessibility
- **Chapter 10** – Personal Affordability
- **Chapter 11** – Summary and Conclusions

2   Methodology

2.1   Overview

2.1.1   The methodology adopted is in line with the DI appraisal process set out in WebTAG Unit A4.2 (and supplementary Highways England guidance), which outlines the following three step approach.

2.2   Step 1 - Screening process

2.2.1   This step involves considering the eight impacts (outlined in section 1.3.4) to establish whether there is potential for any positive or negative impacts upon each of the relevant social groups. Each impact has been individually assessed using the WebTAG screening proforma[8].

2.2.2   Of the eight impacts, major schemes are always assumed to impact upon User Benefits, Noise, Air Quality, Accidents and Affordability. They may have an impact upon Severance, but should never have anything other than, at most, a negligible impact upon Security and Accessibility[9].

2.2.3   The full Screening Proforma for the Stage 2 DI analysis can be found in Appendix A.

2.3   Step 2a – Confirmation of areas impacted by the intervention

2.3.1   For the purposes of this assessment, the largest impact area is set as the county of Cornwall – as illustrated in the maps contained within Appendix B.

2.3.2   The section of the A30 between Chiverton and Carland Cross crosses several Lower Super Outputs Areas (LSOAs) as illustrated in Figure 2-1 below.

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[8] Undertaken at PCF Stage 2 by WSP using DI Screening Proforma (Appendix A, WebTAG Unit A4.2) to assess impact against appraisal output criteria
[9] DI Appraisal and HE Major Schemes V6d. p.3
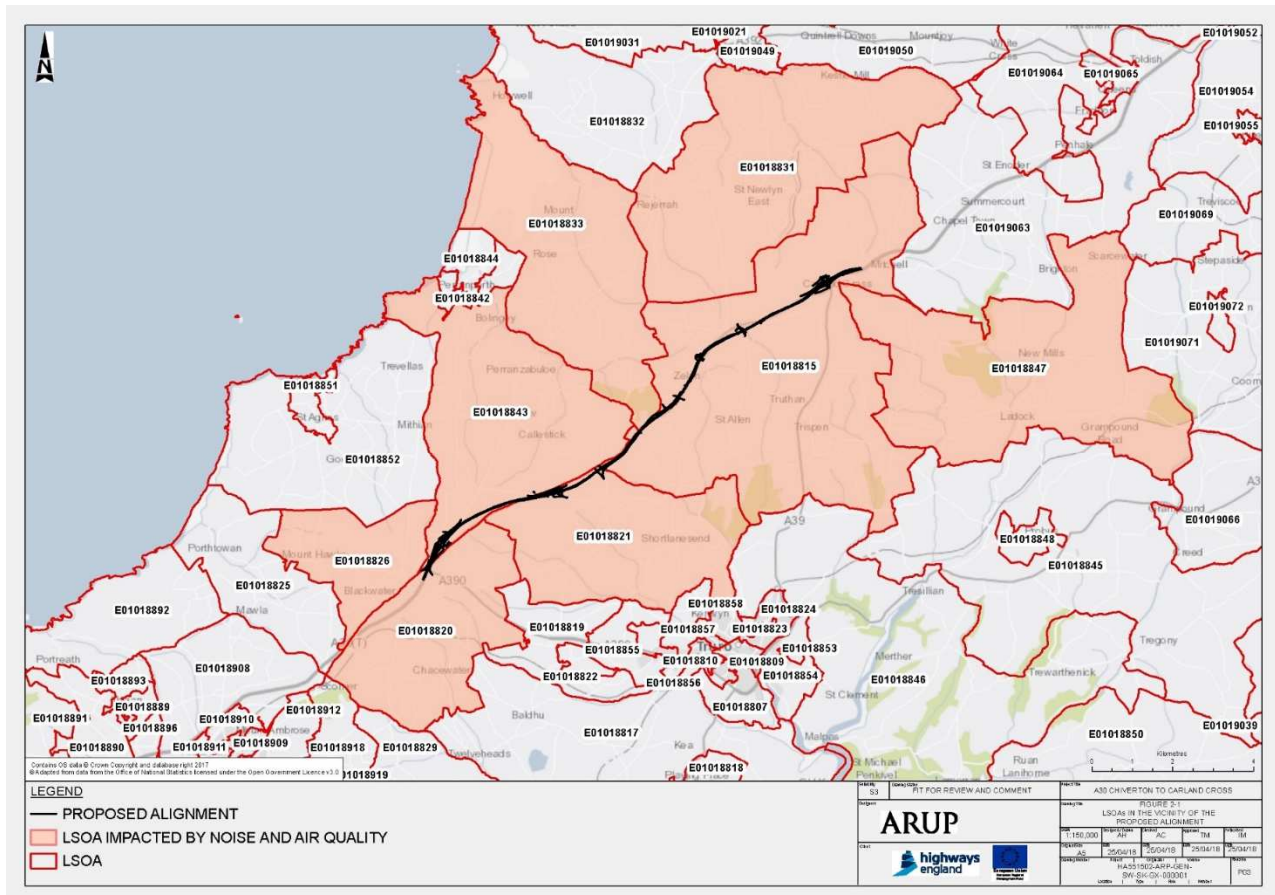
Figure 2-1   LSOAs in the vicinity of the scheme

2.3.3   It should be noted that the impact area varies by indicator. For User Benefits and Affordability, the impact area is the simulation area of the traffic model. The impact area for accidents is similar and corresponds with the COBALT and traffic model simulation areas. For Noise and Air Quality, the impact area is smaller than the model simulation area. Figure 2-2 shows the noise impact area.
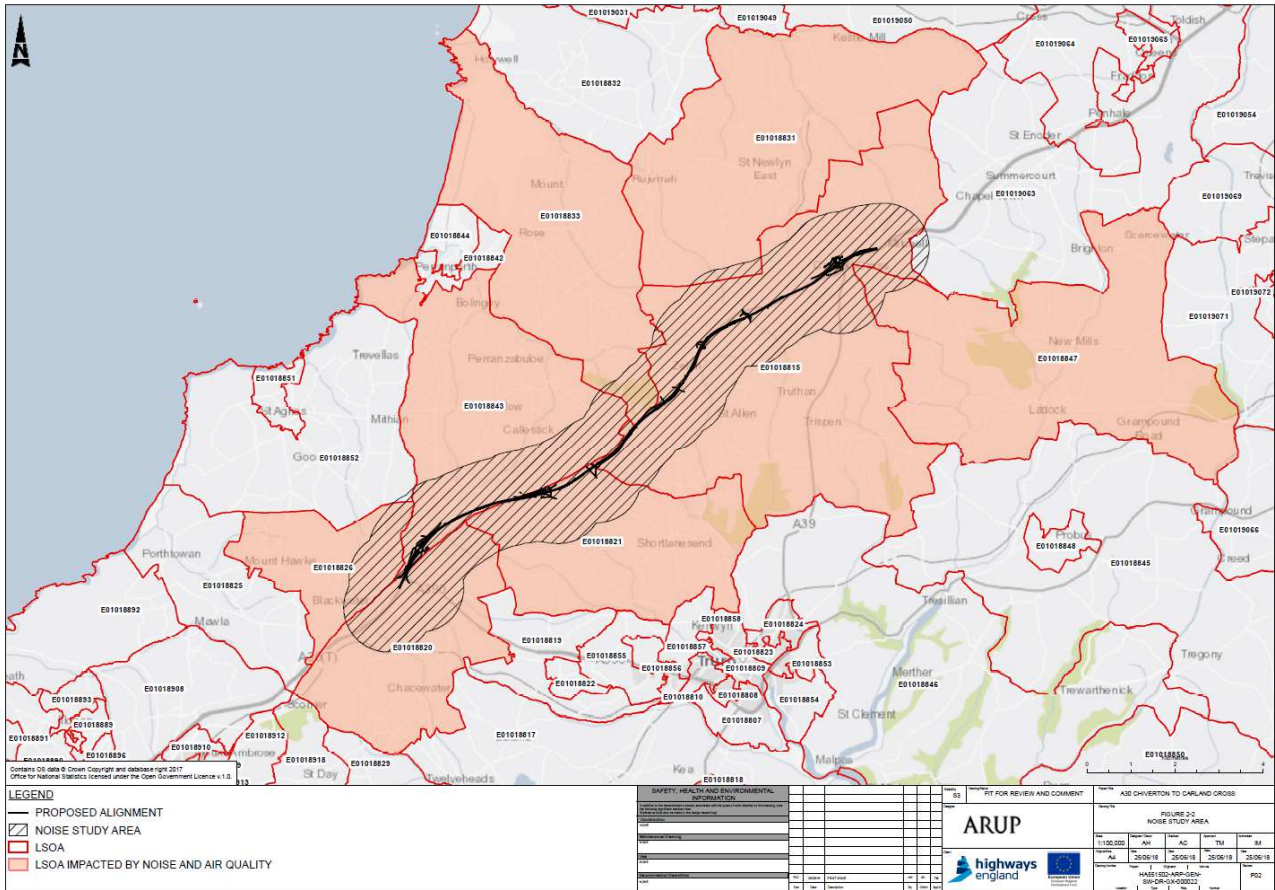
Figure 2-2　Noise Impact area

2.4　Step 2b – Identification of social groups in the impact area

Overview

2.4.1　This step identifies social groups of interest, as identified in Table 1-2, such as those on low incomes. The Index of Multiple Deprivation (IMD) Income Domain can be used as for proxy income at a LSOA level. Other groups, such as the young, older people and those with disabilities can also be identified at LSOA level with the use of 2011 Census data.

2.4.2　Figure B-1 (Appendix B) shows the characteristics of the population of Cornwall broken down by LSOA.

2.4.3　Table 2-1 provides a comparison of the social groups in Cornwall with the entire south-west region, showing that Cornwall has a higher proportion of benefit claimants than the south west as a whole.

Table 2-1 Comparison of social groups in Cornwall to the South West region

Impact	Data Source	Impact Area Average (Cornwall)	SW Regional Average
Income Distribution (proportion of people claiming benefits)	ONS – 2016 Benefit Claimants – Working age client group	11.8%	9.7%
Proportion of population that are children (<16)	ONS - 2011 Census (KS102EW – Age Structure)	16.8%	17.5%
Proportion of population that are young adults (16-25)	ONS - 2011 Census (KS102EW – Age Structure)	10.1%	11.3%
Proportion of population that are older people (65+)	ONS - 2011 Census (KS102EW – Age Structure)	21.6%	19.6%
Proportion of population with a disability	ONS - 2011 Census (KS301EW – Health and provision of unpaid care)	21.4%	18.5%
Proportion of population that are BME	ONS - 2011 Census (KS201EW – Ethnic Group)	4.3%	8.2%
Proportion of households without access to a car	ONS – 2011 Census (KS404EW – Car or van availability)	17.3%	18.9%
Proportion of households with dependent children	ONS - 2011 Census (KS105EW – Household Composition)	25.6%	26.4%

2.4.4   In summary:

- The proportion of children under 16 and young adults is lower than the regional average and the proportion of older people is higher than the regional average.
- The proportion of the population with a disability is higher than the regional average.
- The proportion of black and minority ethnic (BME) origin is much lower than the regional average.
- The proportion of the population without access to a car is lower than the regional average. This is as expected due to the rural nature of Cornwall.
- The proportion of households with dependent children is slightly lower than the regional average.

Income distribution

2.4.5   The English Indices of Deprivation 2015 are based on 37 separate indicators organised across seven distinct domains[10] of deprivation which are combined, using appropriate weights, to calculate the Index of Multiple Deprivation 2015 (IMD, 2015). Figure B-2 (Appendix B) shows the quintile rank by IMD for every LSOA in Cornwall.

2.4.6   Within the IMD, the income deprivation domain measures the proportion of the population in an area that live in income deprived families, including those that are out of work or those that are in work but have low earnings. LSOAs are assigned with a quintile rank depending on their income deprivation score, which is the basis for the DI appraisal of user benefits.

2.4.7   Figure 2-3 shows the distribution of income deprivation (based on the Index of Multiple Deprivation – Income Domain) for the LSOAs within the study area. These quintiles represent 20% brackets, with 0-<20% being the most deprived quintile and 80-100% the least deprived. Figure B-3 (Appendix B) maps the quintile rank by Income Deprivation (IMD 2015) for every LSOA in Cornwall.

2.4.8   It can be seen from Figure 2-3 that the majority of LSOAs within the study area are in the 20-<40% and 40-<60% quintiles. 44 LSOAs sit within the most income deprived quintile; these areas are mainly within Penzance, Camborne, Redruth, Truro and Bodmin.

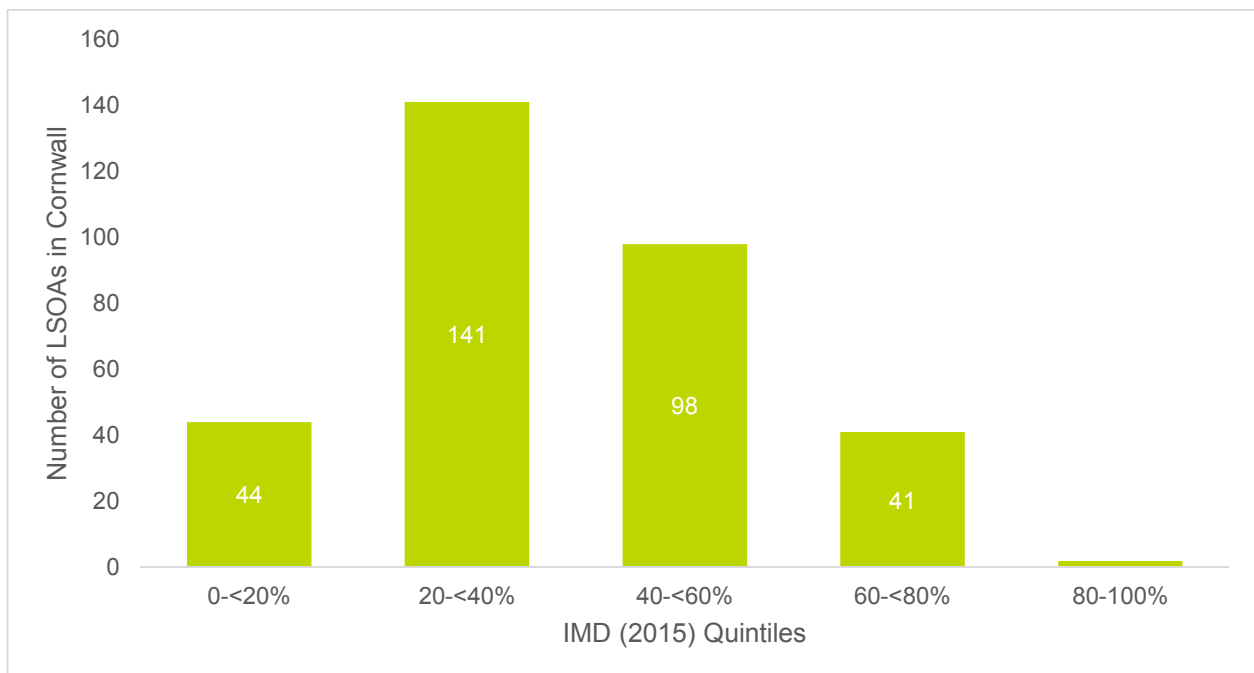**Figure 2-3   Distribution of Deprivation (by Income Domain) in Cornwall (IMD 2015)**

Age distribution

2.4.9   Figures B-4, B-5 and B-6 (all Appendix B) show the distribution of age groups by LSOA.

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[10] These are: Income Deprivation; Employment Deprivation; Health Deprivation and Disability; Education, Skills and Training Deprivation; Crime; Barriers to Housing and Services; and Living Environment Deprivation.

2.4.10   Figure B-4 shows, for each LSOA, the proportion of the population that is under the age of 16. The majority of the LSOAs have a proportion between 15% and 20%, which is below the national average.

2.4.11   Figure B-5 shows the proportion of young adults (16-25 year olds) in each LSOA. The majority have a proportion of less than 10% which is below the national average.

2.4.12   Figure B-6 shows the proportion of the population of older people (over 65 years old) in every LSOA. The majority of Cornwall has a proportion of 20-25% which is above the national average.

People with disabilities

2.4.13   The percentage of people with a disability in each LSOA has been taken from 2011 census data.

2.4.14   For each LSOA, the percentage of people with a disability has been compared against the national average and assigned a ranking when compared to the other LSOAs in the impact area. From this ranking, the LSOA has been assigned a percentile ranking between 0-10% and 90-100%, where 0-10% is in the group of LSOAs in the impact area which contain the greatest proportion of people with disabilities, and 90-100% being LSOAs in the impact area the lowest proportion of people with disabilities.

2.4.15   Figure B-7 (Appendix B) shows the percentile rank of disability for each LSOA. There is a mixture between every LSOA and no obvious trend can be identified.

Black and minority ethnic population

2.4.16   The proportion of people of BME in each LSOA has been taken from 2011 Census data.

2.4.17   For each LSOA, a ranking has been assigned using the same process for people with a disability for the proportion of the population of people of black and minority ethnicity.

2.4.18   Figure B-8 (Appendix B) shows the proportion of BME percentile rank for each LSOA. The general trend is that the proportion of black and minority ethnic is lower than the national average.

Households without access to a car

2.4.19   For each LSOA a ranking has been assigned using the same process for people with a disability for the percentage of people without access to a car.

2.4.20   Figure B-9 (Appendix B) shows proportions of households without access to a car as a percentile rank with each LSOA ranked against the other LSOAs within Cornwall. The figure shows that the majority of Cornwall has a lower than average proportion of the population without access to a car, which is as expected due to Cornwall being predominantly rural. There are certain areas in Cornwall with a higher than average proportion of the population without access to a car, predominantly in urban areas. At a county level, Cornwall has 17% of households without access to a car compared to the English national average of 26%.

Households with dependent children

2.4.21   Figure B-10 (Appendix B) shows for each LSOA the proportion of households with dependent children. The figure shows that the majority of LSOAs have between 20% and 30% of households with dependent children. There is a general spread across Cornwall and no general trend in geographic location has been identified.

2.5   Step 2c - Identification of amenities in the impact area

2.5.1   In this step, the location of sensitive receptors identified in the impact areas is considered. This includes schools, outdoor public spaces where children play, hospitals and care homes. Figure 2-3 identifies the location of sensitive receptors in the vicinity of the scheme.
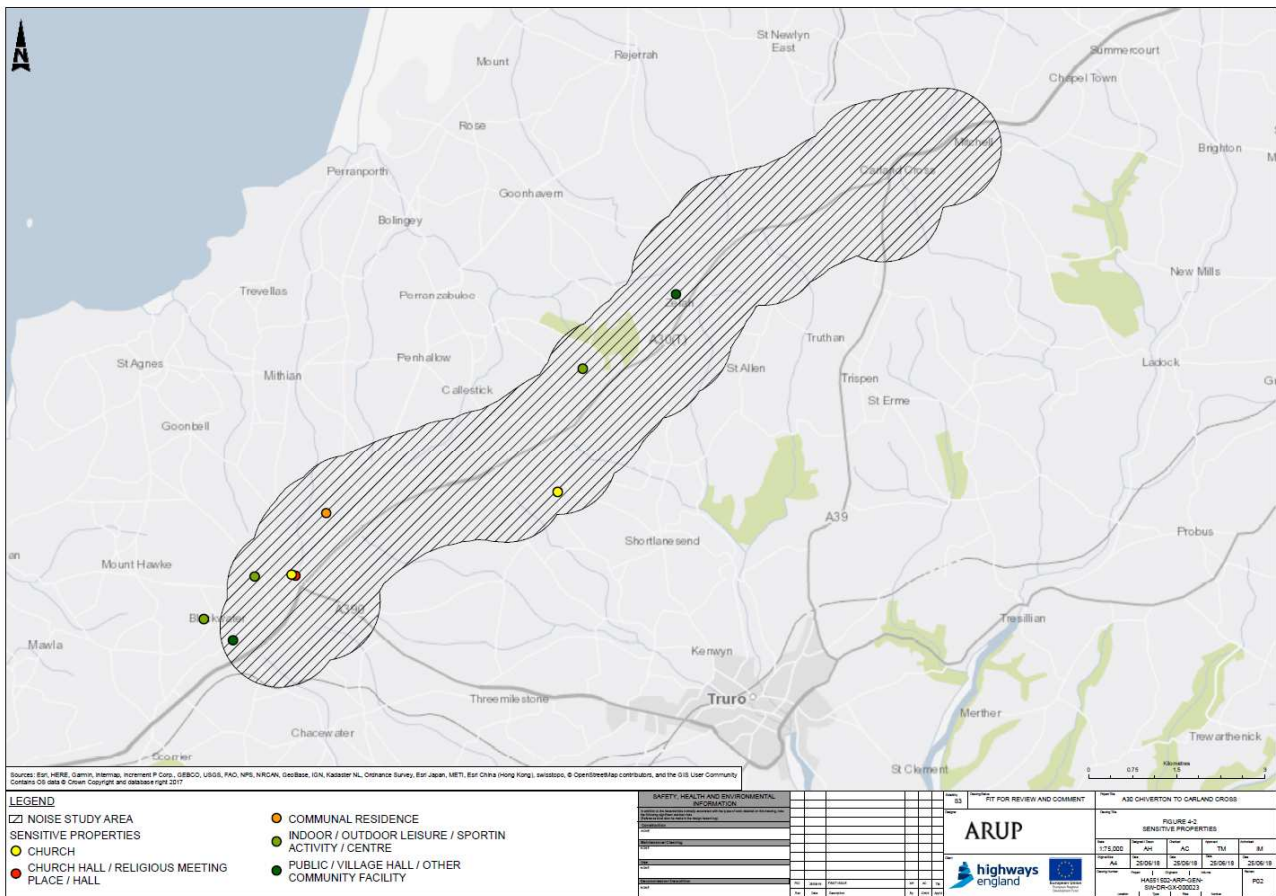

Figure 2-3   Amenities in the impact area

2.6   Step 3 - Appraisal of impacts

2.6.1   Step 3 provides an assessment of the impact of the intervention on each indicator's social groups for input into the Appraisal Summary Table (AST).

2.7   Step 3a: Core analysis of impacts

2.7.1   If prior stages show it to be required, Step 3 provides a detailed assessment of the impact that the scheme's implementation will have on the identified social groups. Each indicator has bespoke guidance, found in WebTAG Unit A4.2 (December 2015), but each follows the broad principles set out in Table 2-2 below.

Table 2-2: General system for grading of DIs for each of the identified social groups (WebTAG Unit A4.2, Table 5)

Impact	Assessment
Beneficial and the population impacted is significantly greater than the proportion of the group in the total population	Large Beneficial ✓✓✓
Beneficial and the population impacted is broadly in line with the proportion of the group in the total population	Moderate Beneficial ✓✓
Beneficial and the population impacted is smaller than the proportion of the group in the total population	Slight Beneficial ✓
There are no significant benefits or disbenefits experienced by the group for the specified impact	Neutral
Adverse and the population impacted is smaller than the proportion of the population of the group in the total population	Slight adverse ✗
Adverse and the population impacted is broadly in line with the proportion of the population of the group in the total population	Moderate Adverse ✗✗
Adverse and the population impacted is significantly greater in line with the proportion of the population of the group in the total population	Large Adverse ✗✗✗

2.8   Step 3b: Full appraisal of DIs and input into AST

2.8.1   The analysis undertaken in Step 3a provides an assessment score for each indicator and each of the social groups under consideration. In addition, a qualitative assessment is provided for each indicator to describe the key impacts. These are summarised in the DI appraisal matrix.

3   User benefits assessment

3.1   Step 1 - Screening process

3.1.1   The scheme's aim, which is to improve network reliability and reduce journey time by delivering capacity enhancements to the SRN, indicates that a full DI appraisal for user benefits is required. The guidance also states that any scheme which generates significant and/or concentrated user benefits requires a full DI appraisal.

3.2   Step 2a – Confirmation of areas impacted by the intervention

3.2.1   The overall impact area selected for user benefits is the whole of Cornwall, as shown in Figure B-1 (Appendix B), which is consistent with the coverage of the traffic model.

3.2.2   User benefits for the scheme are largely derived from those motorists using or crossing the A30 that experience journey time improvements and reductions in congestion. To establish the impact area, the boundary of the traffic model, which has been developed to test the impacts of the A30 Chiverton to Carland Cross improvements, has been assessed. This incorporates the scheme itself, Truro, and parts of Cornwall to the north of the scheme as well as a less detailed buffer network based upon the national SRN from where vehicles on the corridor are assumed to originate and end their journeys. Based on the level of detail in the model network and zoning structure, user benefits have been analysed across a wide area covering the whole of Cornwall.

3.3   Step 2b – Identification of social groups in the impact area

3.3.1   Figure B-3 (Appendix B) shows the distribution of income in the LSOAs in the impact area. The LSOAs are assigned with a quintile rank which is the basis for the DI appraisal of user benefits.

3.3.2   The figure shows that the majority of the impact area is within the 20-<40% and 40-<60% quintiles. This includes rural areas of the county, with the LSOAs recording higher rates of income deprivation tending to be concentrated in parts of larger settlements.

3.4   Step 3 – Appraisal of Impacts

Step 3a – Core Analysis of Impacts

3.4.1   Travel time benefits and the impact to vehicle operating costs for the proposed scheme have been assessed using TUBA (version 1.9.9) over a standard appraisal period of 60 years. The parameters used in the economic assessment have been taken from the TUBA version 1.9.9 economics file, informed by the TAG Data Bookv1.9.9 December 2017.

3.4.2   The transport user benefits have been extracted from the TUBA analysis for every zone. These are then allocated to each LSOA in the impact area based on the percentage of the LSOA total population that falls within each model zone. For the purpose of the DI appraisal, only the non-business user benefits[11] have been

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[11] User classes 2 (Car Commuting), 3 (Car Other) and 7 (LGV)

included because non-business users (e.g. travel to work and education for people with low incomes) would be most susceptible to a change in travel cost. This is in line with WebTAG Unit A4.2 which states that only non-working time (including travel to and from work) should be assessed.

3.4.3   The user benefits for each LSOA have then been attributed to the associated income group and the split of benefits per population in the income group calculated.

3.4.4   The impact has been assessed using the proportion of the population in each income group and the proportion of the total benefit each income group experiences.

3.4.5   The WebTAG Unit A4.2 criteria state that:

- If the difference between the proportion of population and the proportion of benefits is within 5% then the score is *moderate beneficial (✓✓)*
- If the proportion of benefits is more than 5% higher than the proportion of the population the score is *large beneficial (✓✓✓)*
- If the proportion of benefits is more than 5% lower than the proportion of the population then the score is *slight beneficial (✓)*

Table 3-1 provides the outputs from the User Benefit DI analysis.

Table 3-1: Distributional Impact of User Benefits

	IMD (2015) Income Domain					
	Most deprived areas ↔ Least deprived areas					
	0-<20%	**20%-<40%**	**40%-<60%**	**60%-<80%**	**80-100%**	**Total**
Total Benefits (£000s) (∑ LSOAs)	31,356	65,927	179,668	37,442	8,614	323,007
Total Disbenefits (£000s) (∑ LSOAs)	-	-	-	-	-	-
Share of User Benefits	10%	20%	56%	12%	3%	100%
Share of User Disbenefits	-	-	-	-	-	-
Share of Population	12%	24%	46%	15%	3%	100%
Assessment	✓✓	✓✓	✓✓✓	✓✓	✓✓	-

3.4.6   The table shows that the transport user benefits are distributed across the population that are living in different income groups. The scheme provides the least deprived areas with 10% of the transport user benefits, with the majority of user benefits (56%) experienced by the third income group (40-<60% most deprived).

3.4.7   Given the proportionate spread of benefits, which is broadly representative of the population, the scheme is assessed as overall moderate beneficial (✓✓) in terms of the distribution of user benefits.

3.4.8   The impact of the scheme on user benefits has been assessed for every LSOA in the study area. The full assessment by LSOA is shown in Table B-1 (Appendix B). The distribution of the user benefits by LSOA across the county is shown in Figure B-11 (Appendix B).

4   Noise

4.1   Step 1 - Screening process

4.1.1   Noise impacts will be generated by the new road and also from changes in traffic flows on the wider road network.

4.1.2   A total of 834 properties have been analysed within the study area. Five vulnerable properties have been identified.

Class Description	LSOA Code	LSOA Name
Children's Nursery / Creche	E01018820	Cornwall 047D
Special Needs Establishment	E01018820	Cornwall 047D
Care / Nursing Home	E01018815	Cornwall 032A
Children's Nursery / Creche	E01018826	Cornwall 040B
Preparatory / First / Primary / Infant / Junior / Middle School	E01018826	Cornwall 040B

4.2   Step 2a – Confirmation of areas impacted by the intervention

4.2.1   The impact area for the noise sub-objective is as defined in DMRB. This incorporates an area 600m either side of the new road, and existing links on the road network which are predicted to experience change in 18 hour AAWT flow greater than +25% / -20%.

4.3   Step 2b – Identification of social groups in the impact area

4.3.1   The impact area covers the following LSOAs

LSOA Code	LSOA Name	IMD Income Domain	Income Quintile
E01018815	*Cornwall 032A*	40-<60%	3
E01018831	*Cornwall 032B*	40-<60%	3
E01018847	*Cornwall 032D*	40-<60%	3
E01018833	*Cornwall 033A*	40-<60%	3
E01018843	*Cornwall 033C*	40-<60%	3
E01018826	*Cornwall 040B*	40-<60%	3
E01018820	*Cornwall 047D*	40-<40%	3
E01018821	*Cornwall 047E*	60-<80%	4
E01019063	*Cornwall 019D*	40-<40%	3

Table 4-1   Social Groups impacted by changes in Noise sub objectives

4.3.2   The income quintiles assigned to the study area are 3 and 4, where 3 represents the 40-<60% most income deprived and 4 represents the 60-<80% most income deprived.

4.4   Step 2c – Identification of amenities impact area

4.4.1   The impact area has been considered for places that may attract large numbers of people from different income groups. Figure 2-3 identifies sensitive receptors in the vicinity of the scheme.

4.5   Step 3a: Core analysis of impacts:

4.5.1   The scheme will result in an increase in noise levels for the majority of properties in the study area, and a decrease in noise levels for some properties closest to the existing A30 alignment.

4.5.2   The noise assessment indicates that there is the potential for some properties to qualify for road traffic noise insulation under the terms of the Noise Insulation Regulations.

4.6   Step 3b: Full appraisal of DIs and Input into ASTs

4.6.1   The Noise Assessment Workbook (TAG Unit A3) indicates that the scheme will result in 168 properties experiencing an increase in daytime noise levels and 93 properties experiencing a decrease in daytime noise in the forecast (design) year of the scheme.

4.6.2   The Net Present Value (NPV) calculation shows an overall benefit because there would be a substantial number of properties receiving larger noise reductions within the higher noise bands. The majority of properties benefit from the alleviation of traffic along the existing A30 corridor, and the proposed alignment of the new A30 scheme corridor. Mitigation measures to reduce the impact of the new A30 corridor upon properties that would have realised substantial increase from a new traffic noise source are being taken, by both vertical realignment of sections of highway into cuttings, and the inclusion of noise barriers, in the form of Cornish Hedges and timber barriers.

4.6.3   The difference between the number of properties realising noise increases and decreases is smaller for the night-time analysis. This is largely due as a result of the lower traffic noise levels at night, where many of the properties experiencing noise levels in the various 50dB noise bands during the daytime period, reduce down into the <45dB and 45 to 47.5dB noise bands.

4.6.4   WebTAG guidance provides monetary values for changes in noise levels based on the 3 dB bands contained within the workbook between <45 dB and 81+ dB (Leq, 16 hour). Using guidance from Tag Unit A3, an average household size of 2.3 has been assumed. The Net Present Value of the scheme is £552,880.

4.6.5   The distributional analysis has been undertaken based on properties experiencing any level of change in noise level (i.e. there is no minimum 45 dB LAeq, 16 hour noise level or 3 dB banding) and therefore the number of properties experiencing a decrease or increase (see table below) is different from those identified in the noise assessment workbook produced in line with Tag Unit A3.

4.6.6   Properties experiencing 'No Change' in noise level are defined as those where the change in noise level is an increase/decrease of less than 1 dB. 1 dB is considered to be the smallest perceptible change in noise level (para 3.37, DMRB Vol 11, Section 3, Part 7 HD 213/11). The analysis has been undertaken in the 2037 design year, the 15th year after the scheme is open to traffic.

4.6.7   Overall, in terms of noise, the scheme is assessed as having a large beneficial impact for the 40%-<60% most deprived income group and a large adverse impact for the 60%-<80% income group. The scheme is therefore assessed as having a slight beneficial impact, given that the large beneficial impact for the more deprived income group (40%-<60%) outweighs the adverse impact for the

other income group (60%-<80%) which only makes up 10% of the population within the study area.

Table 4-2   Distributional Impact of Noise Sub-objective

	IMD Income Domain					Total
	Most deprived areas ↔ Least deprived areas					**Total**
	0-<20%	20-<40%	40-<60%	60-<80%	80-100%	
Population in each group with increase in noise (A)	-	-	496	76	-	571
Population in each group with decrease in noise (B)	-	-	618	-	-	618
Population in each group with no change in noise (C)	-	-	31	-	-	31
Net no. of Winners/Losers across all groups (D) = (B) - (A)	-	-	122	-76	-	47
Total no. of Winners/Losers across all groups (E) = ∑(D)						47
Net winners/losers in each area as percentage of the total ((F) = (D) / (E)	-	-	262%	-162%	-	100%
Share of Total population in Study Area	-	-	90%	10%	-	100%
Assessment			✓✓✓	✗✗✗		

5 Air quality

5.1 Step 1 - Screening process

5.1.1 Properties are predicted to experience changes in air quality as a result of changes to traffic flow, speeds and composition on the local road network as well as road realignment changing the distance between sources of pollutant emission and sensitive receptors.

5.2 Step 2a – Confirmation of areas impacted by the intervention

5.2.1 The impact area for air quality is as defined in DMRB incorporating all properties within 200m of road links which are affected by the scheme. An affected road link is defined as a section of road which meets any of the following criteria:

- Road alignment changes by 5m or more;

- Daily traffic flows change by 1000 AADT or more;

- Heavy Duty Vehicle flows will change by 200 AADT or more;

- Daily Average speed will change by 10km/hr or more.

5.3 Step 2b – Identification of social groups in the impact area

5.3.1 Figure 5-1 shows the distribution of income across the areas that are impact by changes in air quality.

Figure 5-1 Social Groups impacted by changes in Air Quality sub objectives
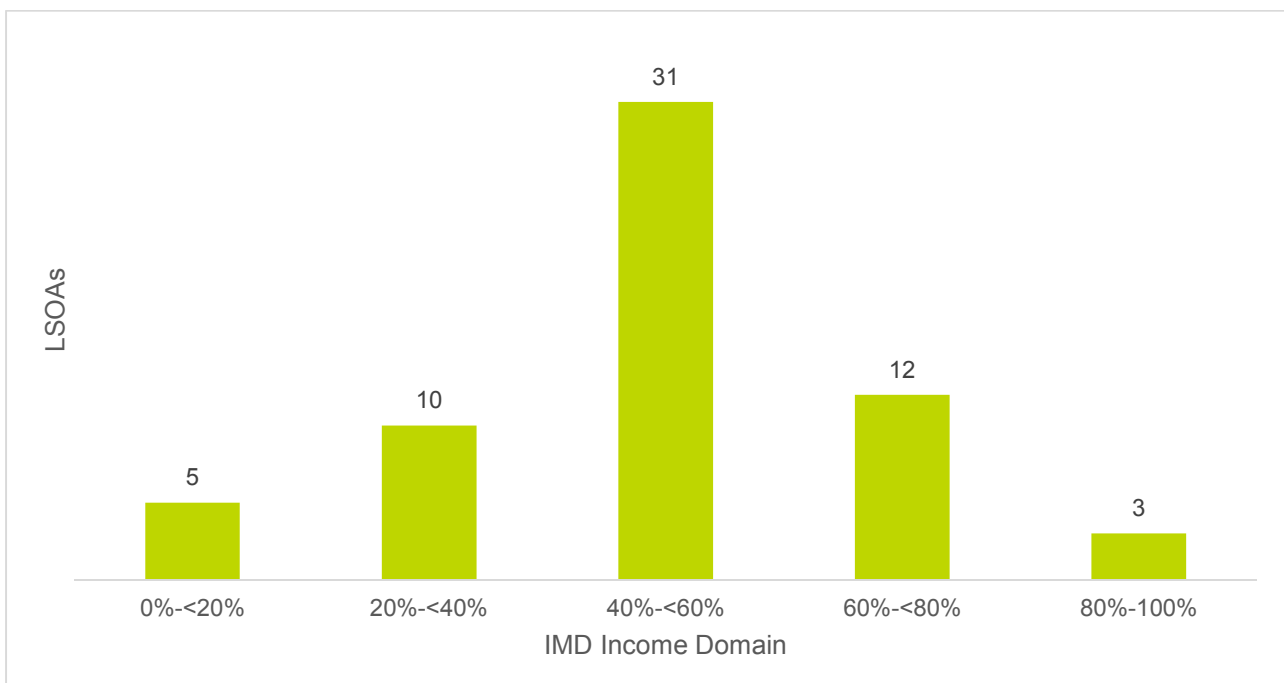
5.3.2 The majority of the properties affected fall within LSOAs representing the 40%-<60% most deprived areas.

5.4   Step 2c – Identification of amenities impact area

5.4.1   The impact area has been considered for places that may attract large numbers of people from different income groups. Figure 2-3 identifies sensitive receptors in the vicinity of the scheme.

5.5   Step 3a: Core analysis of impacts

5.5.1   As a result of changes in vehicle flows and speeds and more smoothly flowing traffic, a small number of properties will experience a slight improvement in air quality. Where route realignment reduces the distances between source and receptor, a slight deterioration in air quality is predicted.

5.6   Step 3b: Full appraisal of DIs and Input into ASTs

5.6.1   The distributional analysis of air quality impacts has been undertaken for both PM_{10} and NO_2. The DMRB criteria for assessing changes in pollutant concentration has been applied to determine which receptors experience an improvement, deterioration or no change in air quality as a result of the scheme.

Table 5-2   Distributional Impact of Air Quality Sub-objective (PM_{10})

| | IMD Income Domain | | | | | Total |
| | Most deprived areas ↔ Least deprived areas | | | | | |
	0-20%	20-40%	40-60%	60-80%	80-100%	
No of properties with improved air quality (A)	133	2,097	5,594	2,084	0	9,908
No of properties with no change in air quality (B)	0	0	0	0	0	0
No of properties with deteriorating air quality (C)	1,302	1,409	4,664	891	0	8,266
Net no. of Winners/Losers across all groups (D) = (A) - (C)	-1,169	688	930	1,193	0	1,642
Total no. of Winners/Losers across all groups (E) = ∑(D)						1,642
Net winners/losers in each area as percentage of the total ((F) = (D) / (E)	-71%	42%	57%	73%	0%	100%
Share of Total population in Study Area	8%	19%	54%	16%	4%	100%
Assessment	✗✗✗	✓✓✓	✓✓	✓✓✓	Neutral	

Table 5-3   Distributional Impact of Air Quality Sub-objective (NO$_2$)

	IMD Income Domain					Total
	Most deprived areas ↔ Least deprived areas					
	0-<20%	20-<40%	40-<60%	60-<80%	80-100%	
No of properties with improved air quality (A)	142	2,111	5,191	1,916	0	9,360
No of properties with no change in air quality (B)	369	540	1,549	221	0	2,679
No of properties with deteriorating air quality (C)	924	855	3,518	838	0	6,135
Net no. of Winners/Losers across all groups (D) = (A) - (C)	-782	1,256	1,673	1,078	0	3,225
Total no. of Winners/Losers across all groups (E) = ∑(D)						3,225
Net winners/losers in each area as percentage of the total ((F) = (D) / (E)	-24%	39%	52%	33%	0%	100%
Share of Total population in Study Area	8%	19%	54%	16%	4%	100%
Assessment	✗✗✗	✓✓✓	✓✓	✓✓✓	Neutral	

5.6.2   Overall, in terms of air quality impact, the scheme is assessed as Moderate Beneficial. Air quality impacts disbenefit the most deprived (0-<20%) income group with the percentage of net losers outweighing the income group's share of the total population within the air quality study area. The largest benefits are experienced by those in the 20-<40% and 60-<80% income groups, while for the 40%-<60% group air quality impacts are proportional with the share of the total population in the study area.

6 Accidents

6.1 Step 1 - Screening Process

6.1.1 The alternative vehicular route provided by the new dual carriageway between Chiverton and Carland Cross is expected to reduce traffic on the existing A30 which will remain the main route for local traffic, public transport, pedestrians and cyclists. This is expected to reduce the risk of accidents and, in particular, to vulnerable user groups. Changes in vehicle speeds as a result of reduced congestion may also impact on accident risk to both motorists and vulnerable road users.

6.1.2 WebTAG Unit A4.2 states that if the intervention causes any significant changes (>10%) in vehicle flow, speed, HDV use or a significant change (>10%) in the number of pedestrians, cyclists or motorcyclist using the road network, then a full assessment should be undertaken. The significant change in traffic flow caused by the implementation of the scheme indicates a full DI assessment is required.

6.2 Step 2a – Confirmation of areas impacted by the intervention

6.2.1 Economic benefit due to accident savings arising from the proposed schemes have been assessed using COBALT (parameters file 2017.1). The networks chosen have been deemed to provide sufficient coverage of the network within the vicinity of the scheme where changes in traffic flows are most significant.

6.3 Step 2b – Identification of social groups in the impact area

6.3.1 The income group that a person is in does not have bearing upon their susceptibility to traffic accidents, although there is some evidence to support that those living in more deprived areas are involved in more traffic collisions than those in less deprived areas (WebTAG Unit A4.2 paragraph 5.1.1). The collision data that is available for this project does not record the income group of those involved in the collision. The income distribution has therefore not been considered in any further accident analysis.

6.3.2 Children under 16, young males (16-24) and older people (greater than 65) are considered to be groups that are disproportionately vulnerable to traffic accidents. Table 2 from WebTAG Unit A4.2 shows that the following additional social groups should be identified when assessing accidents:

- Children – Young People under 16 years old
- Young Adults – People aged between 16 and 25 years old
- Older people – People aged over 65 years old

6.3.3 Additionally, Table 6 of WebTAG Unit A4.2 also identifies these additional social groups:

- Pedestrians
- Cyclists
- Motorcyclists
- Young Male Drivers

6.3.4 Figures B-4 to Figure B-6 (Appendix B) show the distributions of these population groups within the impact area. The LSOAs are assigned percentage groupings.

6.3.5   Figure B-4 shows that children make up 10-20% of the population in the majority of the Impact Area with several LSOAs in close proximity to the scheme showing between 20-25% of the population being below the age of 16 years old.

6.3.6   Young adults are shown to form 0-10% of the population in the majority of the LSOAs. Truro and Shortlanesend are shown to have a slightly higher young adult population with 16-25 year olds forming between 10 and 20% of the population. This trend in the proportion of young adults is also observed near larger settlements such as Falmouth and Bodmin.

6.3.7   The proportion of older people within the LSOAs varies across the Impact Area with the north western part of Cornwall and the southern coast showing a proportion in excess of 25%. In contrast, the LSOAs in close proximity to the scheme have elderly populations that form between 10-25% of the total population.

Step 3 - Appraisal of Impacts

6.3.8   COBALT appraisal work undertaken for the scheme has indicated that the scheme will have a beneficial impact on accidents overall. WebTAG Unit A4.2 states that a full quantitative assessment should therefore be undertaken for the relevant links within the Impact Area. Figure 6-1 and Figure 6-2 show the extents of the COBALT network.
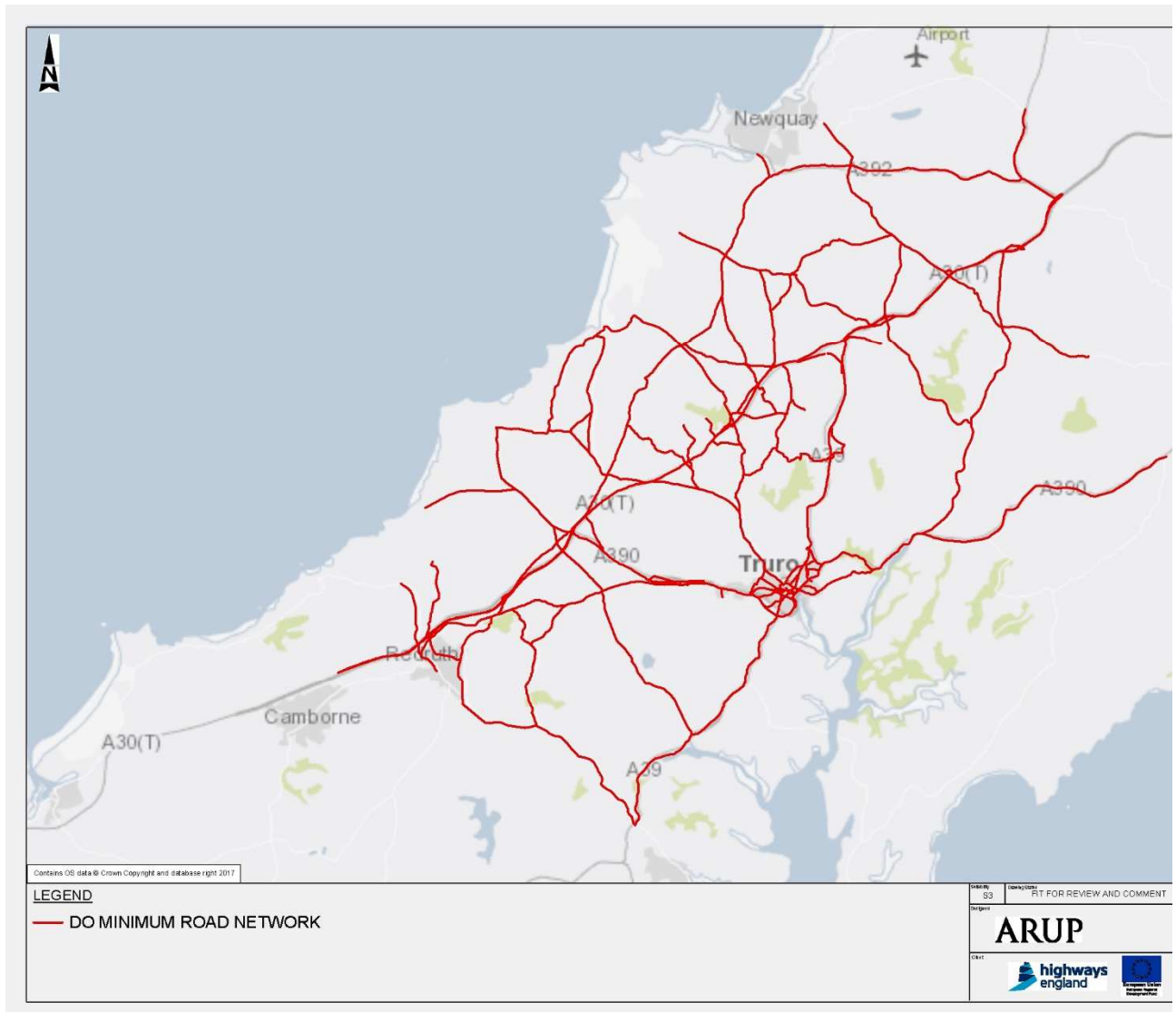
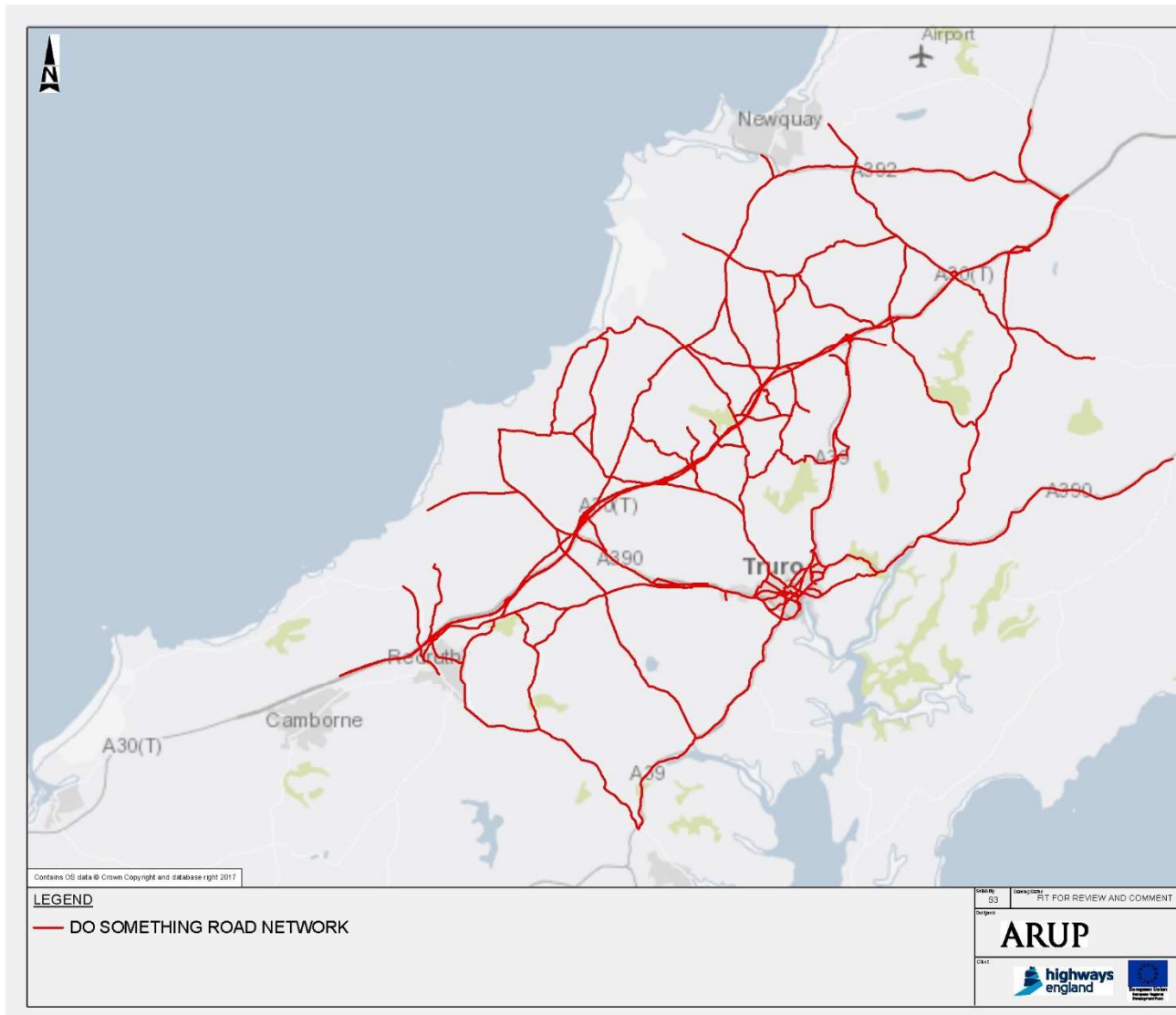**Figure 6-1   COBALT Do Minimum Network**

Figure 6-2   COBALT Do Something Network

6.3.9   Accident data has been obtained from the Department for Transport[3] for the area covered by the COBALT network. The data has been taken from the 1st January 2012 to the 31st December 2016 and has been used for the accident benefit analysis. The categories used in the casualty records are as follows:

- Young males (below 24 years old)

- Older people (older than 65 years old)

- Motorcycle riders

- Cyclists

- Pedestrians

- Other

6.3.10   The data has been split into casualties according to vulnerable user groups. Table 6-1 shows the breakdown of casualties per link.

Table 6-1   Casualties within the study area 2012 – 2016

| Link	Total Casualties	Vulnerable network user casualties						Percentage of total casualties					
		Children	Older People	Pedestrian	Cyclist	Motorcyclist	Young male drivers	Children	Older People	Pedestrian	Cyclist	Motorcyclist	Young male drivers
A392	46	0	7	5	3	1	1	0%	15%	11%	7%	2%	2%
A3058	56	1	5	0	1	0	0	2%	9%	0%	2%	0%	0%
Nancarrow-Shortlanesend	2	0	1	0	0	0	0	0%	50%	0%	0%	0%	0%
B3284 Shotlanesend - Truro	10	0	3	0	1	0	0	0%	30%	0%	10%	0%	0%
A30 - Inside Scheme	152	5	35	3	2	0	2	3%	23%	2%	1%	0%	1%
B3277 St Agnes	18	0	9	3	0	0	0	0%	50%	17%	0%	0%	0%
B3284 N Chybucca	10	0	2	0	0	0	0	0%	20%	0%	0%	0%	0%
B3284	68	0	9	3	2	0	1	0%	13%	4%	3%	0%	1%
A3075	106	1	23	2	4	0	0	1%	22%	2%	4%	0%	0%
B3285	27	0	6	1	0	1	0	0%	22%	4%	0%	4%	0%
A30 West of Scheme	104	1	23	3	4	1	2	1%	22%	3%	4%	1%	2%
B3284 S Chybucca	16	0	4	2	1	0	1	0%	25%	13%	6%	0%	6%
A390	168	2	27	9	4	0	1	1%	16%	5%	2%	0%	1%
A39	61	2	11	0	3	1	0	3%	18%	0%	5%	2%	0%
A3075	106	1	23	2	4	0	0	1%	22%	2%	4%	0%	0%
B3275	20	0	4	0	0	0	0	0%	20%	0%	0%	0%	0%
A393	34	0	2	2	2	0	0	0%	6%	6%	6%	0%	0%
B3285	20	0	2	1	0	0	0	0%	10%	5%	0%	0%	0%
Carland Services	5	1	0	0	1	0	1	20%	0%	0%	20%	0%	20%
A30 East of Scheme	104	1	23	3	4	1	2	1%	22%	3%	4%	1%	2%
B3300	21	0	6	2	0	1	0	0%	29%	10%	0%	5%	0%
B3298	45	0	9	2	2	0	0	0%	20%	4%	4%	0%	0%
A3047	19	0	5	0	3	0	0	0%	26%	0%	16%	0%	0%
Overall	1,218	15	239	43	41	6	11	1%	20%	4%	3%	0%	1%
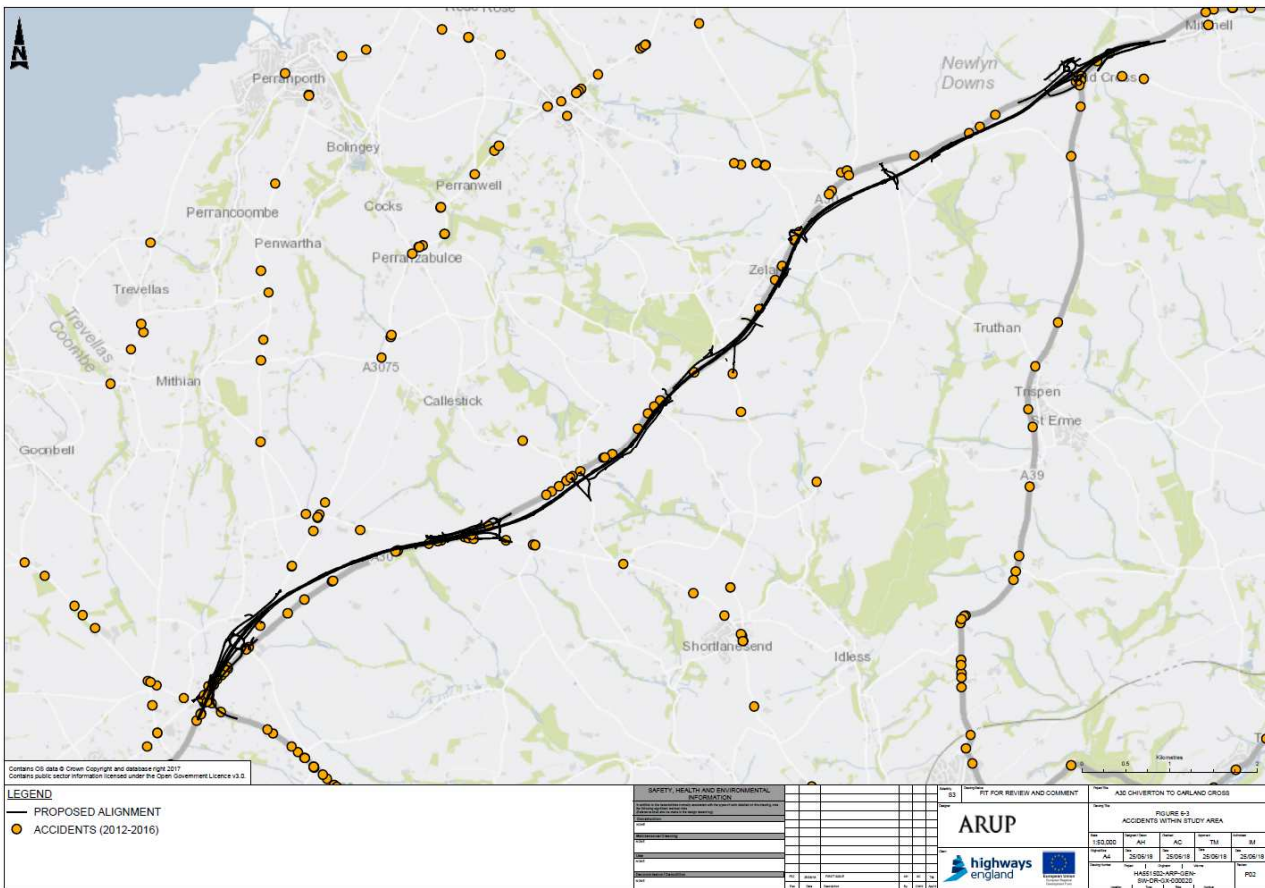
Figure 6-3   Accidents in the vicinity of the scheme (2012-2016)

6.3.11   Older people are shown to suffer more accidents when compared to the other vulnerable social groups. The proportion of accidents for older people is representative of the population, with a similar proportion of accidents compared to their share of the county-wide population.

6.3.12   As recommended by WebTAG, each link within the COBALT network has been assessed in terms of the change in flow as a result of the scheme, and the current vulnerability of certain groups. A summary of the results are presented in Table 6-2 with more detail provided in Appendix C. Note that these tables take the place of the individual WebTAG worksheets but apply the same criteria; due to the large number of links affected this is considered the more appropriate presentation.

6.3.13   Paragraph 5.4.18 of WebTAG Unit A4.2 states that 'a majority vote of overall scores is used to determine the final score' for accident impacts. The majority of links are shown to have a Neutral impact on most of the vulnerable social groups identified. Overall, the scheme is assessed as having a Slight Beneficial impact given its impact on older people.

Table 6-2   Impact on vulnerable network users by link

Link	Vulnerable network user casualties					
	Children	Older People	Pedestrian	Cyclist	Motorcyclist	Young male drivers
A392	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A3058	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse
Nancarrow-Shortlanesend	Slight Beneficial	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial
B3284 Shotlanesend - Truro	Slight adverse	Moderate Adverse	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse
A30 - Inside Scheme	Moderate Beneficial	Large Beneficial	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
B3277 St Agnes	Slight adverse	Moderate adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse
B3284 N Chybucca	Slight adverse	Moderate adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse
B3284	Slight adverse	Moderate adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse
A3075	Slight Beneficial	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial
B3285	Moderate Beneficial	Large Beneficial	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
A30 West of Scheme	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
B3284 S Chybucca	Moderate Adverse	Large Adverse	Moderate Adverse	Moderate Adverse	Moderate Adverse	Moderate Adverse
A390	Slight Beneficial	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial
A39	Slight Beneficial	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial
A3075	Slight Beneficial	Moderate Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial
B3275	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A393	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse
B3285	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial	Slight Beneficial
Carland Services	Moderate Adverse	Slight Adverse	Moderate Adverse	Slight Adverse	Slight Adverse	Moderate Adverse
A30 East of Scheme	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
B3300	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
B3298	Moderate adverse	Large Adverse	Moderate Adverse	Large Adverse	Moderate Adverse	Moderate Adverse
A3047	Moderate adverse	Large Adverse	Moderate Adverse	Large Adverse	Moderate Adverse	Moderate Adverse
Overall	Neutral	Slight Beneficial	Neutral	Neutral	Neutral	Neutral

7   Security

7.1   Step 1 - Screening Process

7.1.1   The impact on security is assumed to be negligible in line with Highways England DI guidance on major schemes. The scheme is not expected to have an impact on security with no additional public transport, pedestrian or cycle facilities planned. Therefore, it is considered that no further DI analysis is required.

8   Severance

8.1   Step 1 - Screening Process

8.1.1   The existing A30 is not well served with formal pedestrian or cycle crossings and as a result can cause severance by acting as a barrier to pedestrian and cycle movements. The scheme will introduce a new high speed route which will experience a large volume of traffic. Pedestrian surveys identified that at existing crossing points on the A30 to the south of Zelah and at Chiverton Cross an average of less than two pedestrians per day crosses the road; numbers this low mean that a full assessment of distributional impacts is not possible.

9   Accessibility

9.1   Step 1 - Screening Process

9.1.1   It is not anticipated that the scheme will create any new barriers between communities and services, additional to those experienced with the existing A30. No additional public transport facilities are planned as part of this stage of the scheme. Access will be improved due to improved journey reliability. Therefore, it is considered that no further DI analysis is required

10   Personal affordability

10.1   Step 1 - Screening Process

10.1.1   Personal affordability is concerned with out of pocket non-business user costs. In the case of highway schemes, these are restricted to vehicle operating costs (VOC), which are essentially fuel costs and vehicle maintenance. The scheme will improve journey times and reduce congestion which will beneficially impact on car fuel and non-fuel operating costs. The scheme is therefore likely to have an impact on non-business user costs of the scheme and therefore will be carried forward to the Step 2 of the DI appraisal.

10.2   Step 2a – Confirmation of areas impacted by the intervention

10.2.1   The overall impact area for Personal Affordability is as shown in Table B-2 (Appendix B). Personal Affordability impacts for the scheme will be largely related to motorists using the A30 in the scheme extents who experience journey time improvements and reductions in congestion and therefore an increase in vehicle speed.

10.2.2   To establish the impact area, the boundary of the strategic traffic model, which has been developed to test the impacts of the A30 Chiverton to Carland Cross improvements, has been assessed. This incorporates the scheme itself, Truro,

and parts of Cornwall to the north of the scheme as well as a less detailed buffer network based upon the national SRN from where vehicles on the Corridor are assumed to originate and end their journeys. Based on the level of detail in the model network and zoning structure, personal affordability has been analysed across a wide area covering the whole of Cornwall.

10.3   Step 2b – Identification of social groups in the impact area

10.3.1   Figure B-3 (Appendix B) shows the distribution of income (income deprivation, IMD 2015) by LSOAs in the impact area. The LSOAs are assigned with a quintile rank which is the basis for the DI appraisal of personal affordability.

10.3.2   The figure shows that the majority of the impact area is within the 20-<40% and 40-<60% quintiles. This includes rural areas of the county, with the areas recording higher rates of income deprivation tending to be concentrated in parts of larger settlements.

10.4   Step 3 – Appraisal of impacts

10.4.1   The process for appraising personal affordability impacts is similar to that used in the transport user benefits assessment. Instead of user benefits, however, the vehicle operating costs (VOCs) are used. The impact score is evaluated using the same method as shown for user benefits. Where there is an overall disbenefit the impact score is adverse.

Table 7-1   Distributional Impact of Vehicle Operating Costs

	IMD Income Domain					
	Most deprived areas ↔ Least deprived areas					
	0-<20%	20%-<40%	40%-<60%	60%-<80%	80-100%	Total
Total Benefits (£m) (∑ LSOAs)	-	-	-	-	-	
Total Disbenefits (£m) (∑ LSOAs)	-9	-17	-38	-13	-3	-81
Share of VOC Benefits	-	-	-	-	-	-
Share of VOC Disbenefits	11%	21%	48%	16%	4%	100%
Share of Population	12%	24%	46%	15%	3%	100%
Assessment	✘✘	✘✘	✘✘	✘✘	✘✘	

10.4.2   The table above shows the affordability assessment separated into IMD income quintiles. The scheme increases speed along the route and in turn the vehicle operating costs have increased in the study area. The assessment shows that the scheme has an overall moderate adverse effect on affordability.

10.4.3   The impact of the scheme on personal affordability has been assessed for every LSOA in the study area. The full assessment by LSOA is shown in Table B-2 (Appendix B).

10.4.4   The proportionate spread of disbenefits is broadly representative of the population. The proportions are similar to those in Table 3-1, which shows the distribution of user benefits. Those income groups that benefit most from the scheme in terms of journey time savings are also the groups that incur the largest disbenefits in terms of increases to VOCs. However, it is important to note that the disbenefits above relate to changes in vehicle speed, and are therefore 'optional' as vehicles will not have to travel at 70mph and incur this additional cost.

Appendix A

A.1   DI Screening Proforma (PCF Stage 2)

Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive / negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
User Benefits	The TUBA user benefit analysis software or an equivalent process has been used in the appraisal; and/or the value of user benefits Transport Economic Efficiency (TEE) table in non-zero	Yes – Change in benefits to users of the A30 and the surrounding area	TUBA results and the user benefit from the TEE table suggest that there will be a benefit to users in the region of £497m* including both business and non-business benefits.	Yes
Noise	Any change in alignment of transport corridor or any links with significant changes (> 25% or <-20%) in vehicle flow speed or % HGV content	Yes – Negative	The properties are predicted to experience a noise impact due to noise levels generated by the new road and from changes in traffic flows on the wider road network.	Yes
Air quality	Any change in alignment of transport corridor or any links with significant changes in vehicle flow, speed or %HDV content: • Change in 24 hour AADT of 1000 vehicles or more • Change in 24 hour AADT of HDV of 200 HDV vehicles or more • Change in daily average speed of 10kph or more • Change in peak hour speed of 20kph or more • Change in road alignment of 5m or more	Yes – Positive	Properties are predicted to experience changes in air quality as a result of changes to traffic flow, speeds and composition on the local road network as well as road realignment changing the distance between sources of pollutant emission and sensitive receptors.	Yes
Accidents	Any change in alignment of transport corridor (or road layout) that may have positive or negative safety impacts, or any links with significant change (> 10%) in the number of pedestrians, cyclists or	Yes – Positive	COBA-LT results suggest the scheme will produce accident savings in the region of £41.6m*	Yes

Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive / negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
	motorcyclists using road network.			
Security	Any change in public transport waiting / interchange facilities, including pedestrian access expected to affect user perceptions of personal security.	No – the scheme does not provide any security benefits or disbenefits	The scheme will not have any significant impact on security.	No
Severance	Introduction or removal of barriers to pedestrian movement, either through changes to road crossing provision, or through introduction of new public transport or road corridors. Any areas with significant changes (> 10%) in vehicle flow, speed, % HDV content.	No – the scheme foes not provide any severance benefits or disbenefits	It is not anticipated that the scheme will create any new severance and will not provide any new barriers between communities and services, additional to those experienced with the existing A30. There are no services directly accessed from the existing A30. Pedestrian surveys identified that at an existing point on the A30 to the south of Zelan on average less than one pedestrian crosses the existing A30; based on this, it is likely that the numbers are too low to produce a meaningful assessment of DI.	No
Accessibility	Changes in routings or timings of current public transport services, any changes to public transport provision, including routing, frequencies, waiting facilities (bus stops / rail stations) and rolling stock, or any indirect impacts on accessibility to services (e.g. demolition & re-location of a school).	No – the scheme does not provide any Accessibility benefits or disbenefits	The scheme does not inherently provide for any change in Public Transport Accessibility.	No
Affordability	In cases where the following changes would occur; Parking charges (including where changes in the allocation of free or reduced fee spaces may occur); Car fuel and	Yes – slightly negative – car operating costs will change	Rerouting will impact on journey speeds and congestion on the A30, impacting on personal affordability of car users as higher speeds can lead to higher operating costs. The scheme is	Yes

Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive / negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
	non-fuel operating costs (where, for example, rerouting or changes in journey speeds and congestion occur resulting in changes in costs); Road user charges (including discounts and exemptions for different groups of travellers); Public transport fare changes (where, for example, premium fares are set on new or existing modes or where multi-modal discounted travel tickets become available due to new ticketing technologies); or Public transport concession availability (where, for example, concession arrangements vary as a result of a move in service provision from bus to light rail or heavy rail, where such concession entitlement is not maintained by the local authority.		expected to have a neutral impact on public transport and cycling.	

* Calculated at PCF Stage 2

Appendix B

Figure B-1 LSOA Population
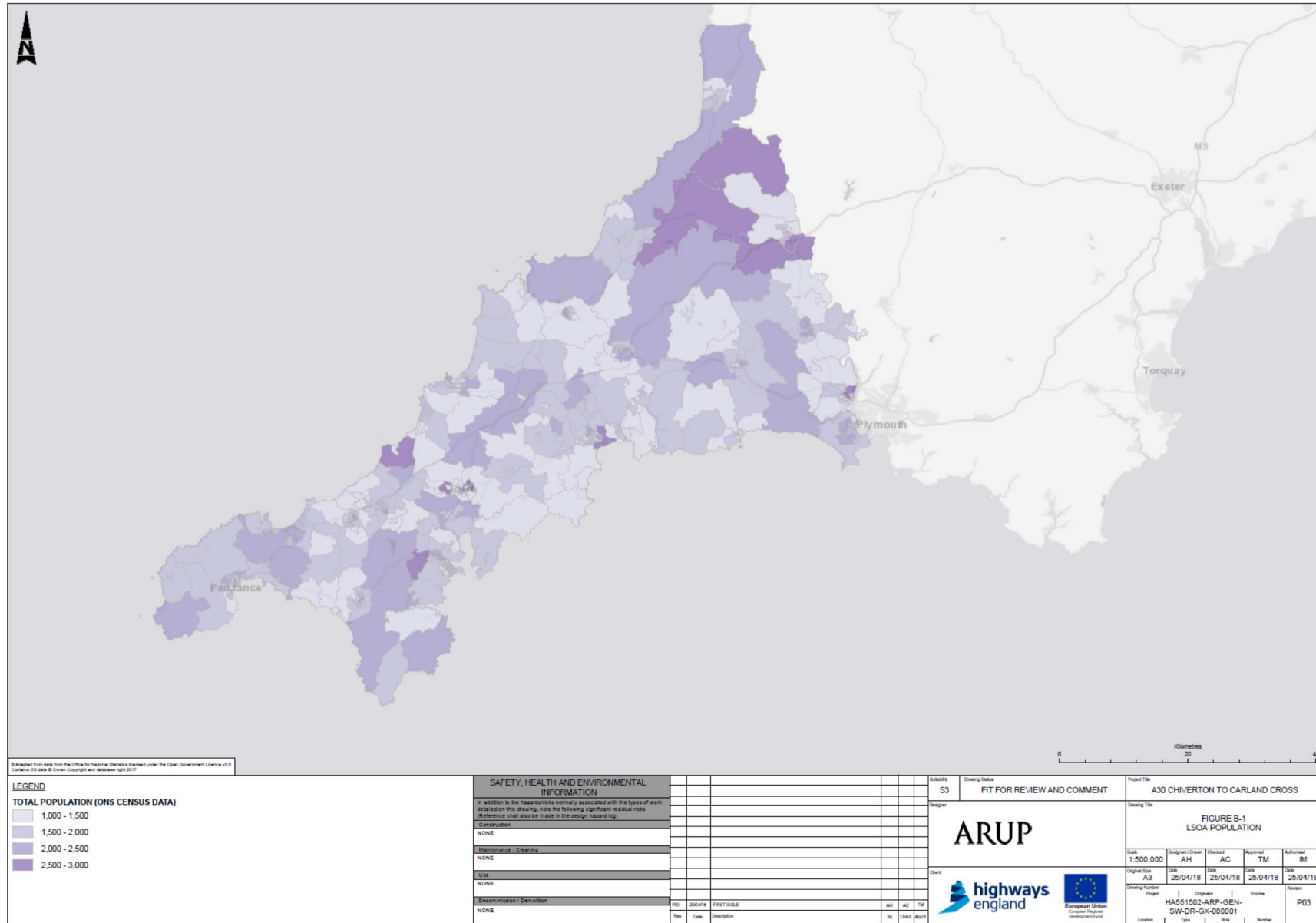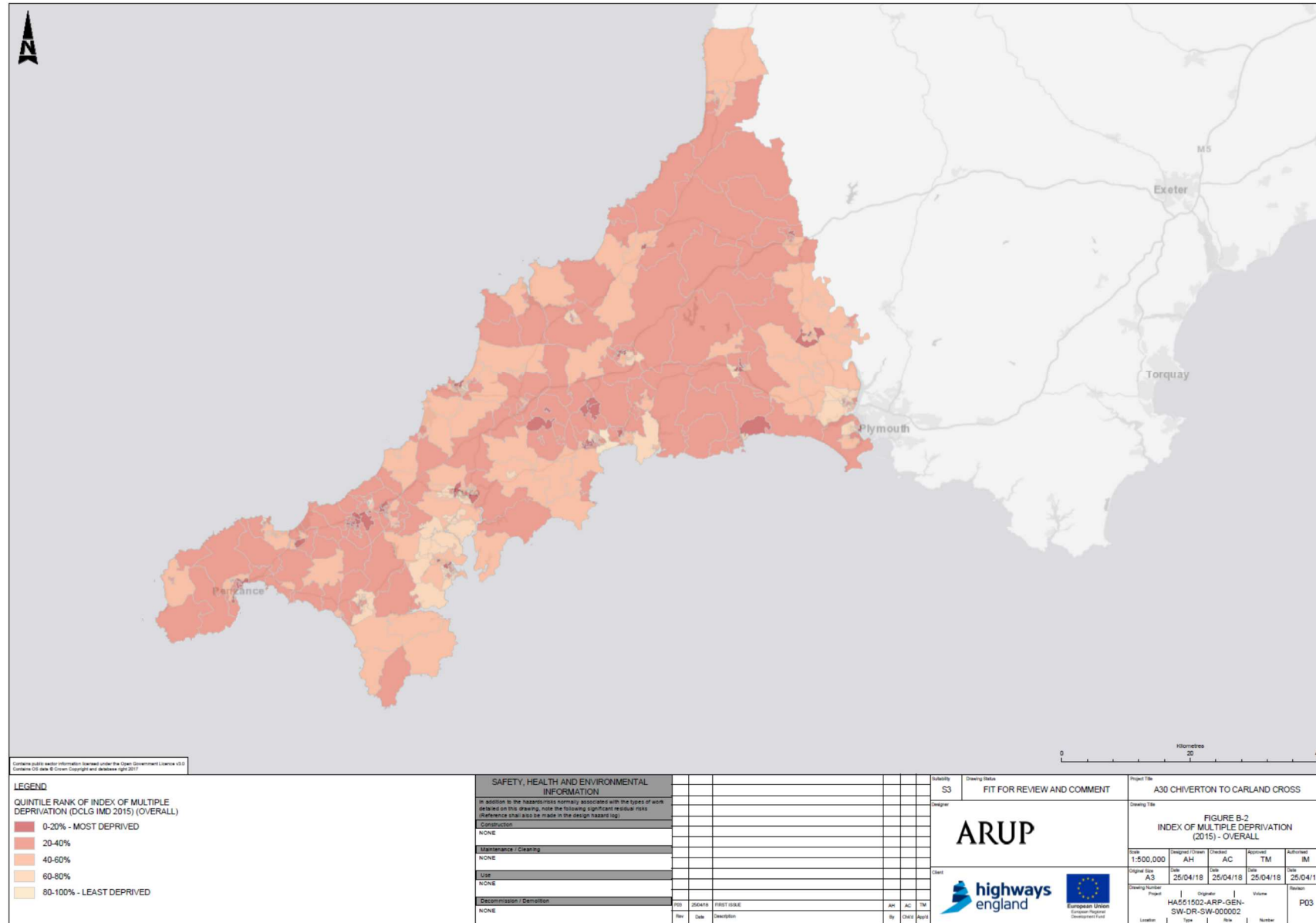
Figure B-2 Index of Multiple Deprivation (2015) – Overall
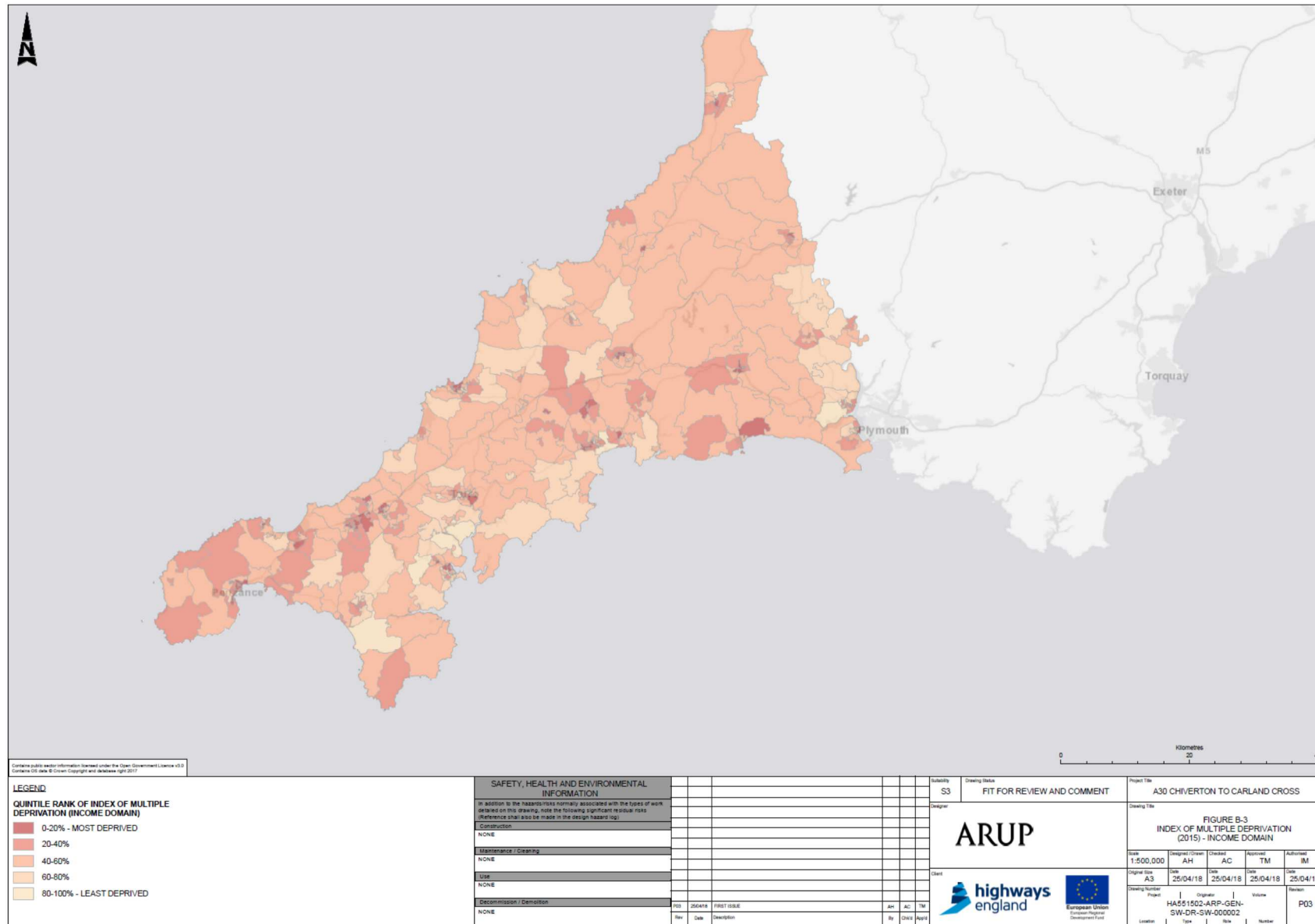
Figure B-3   Index of Multiple Deprivation (2015) – Income Domain
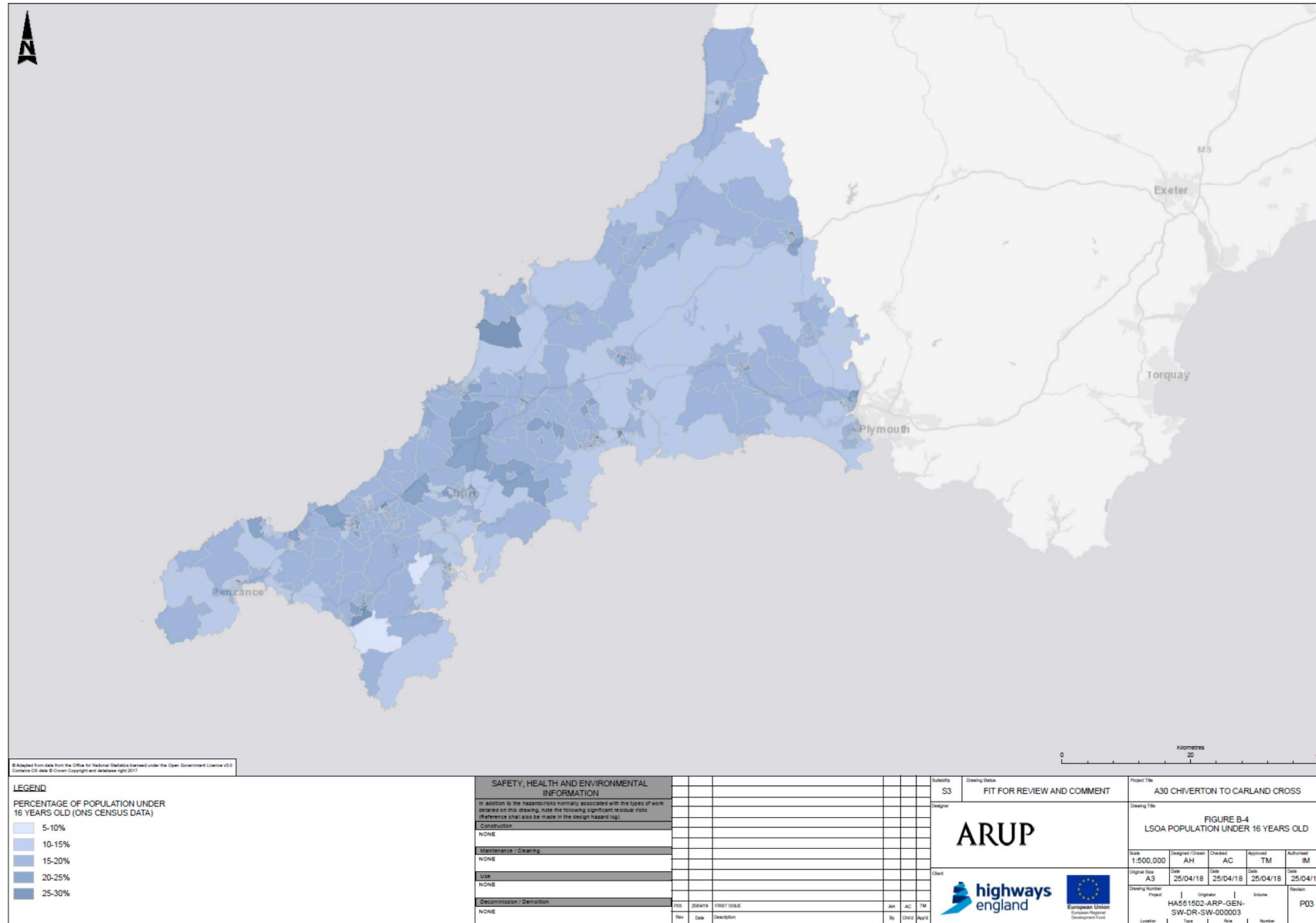
Figure B-4   LSOA population under 16 years old
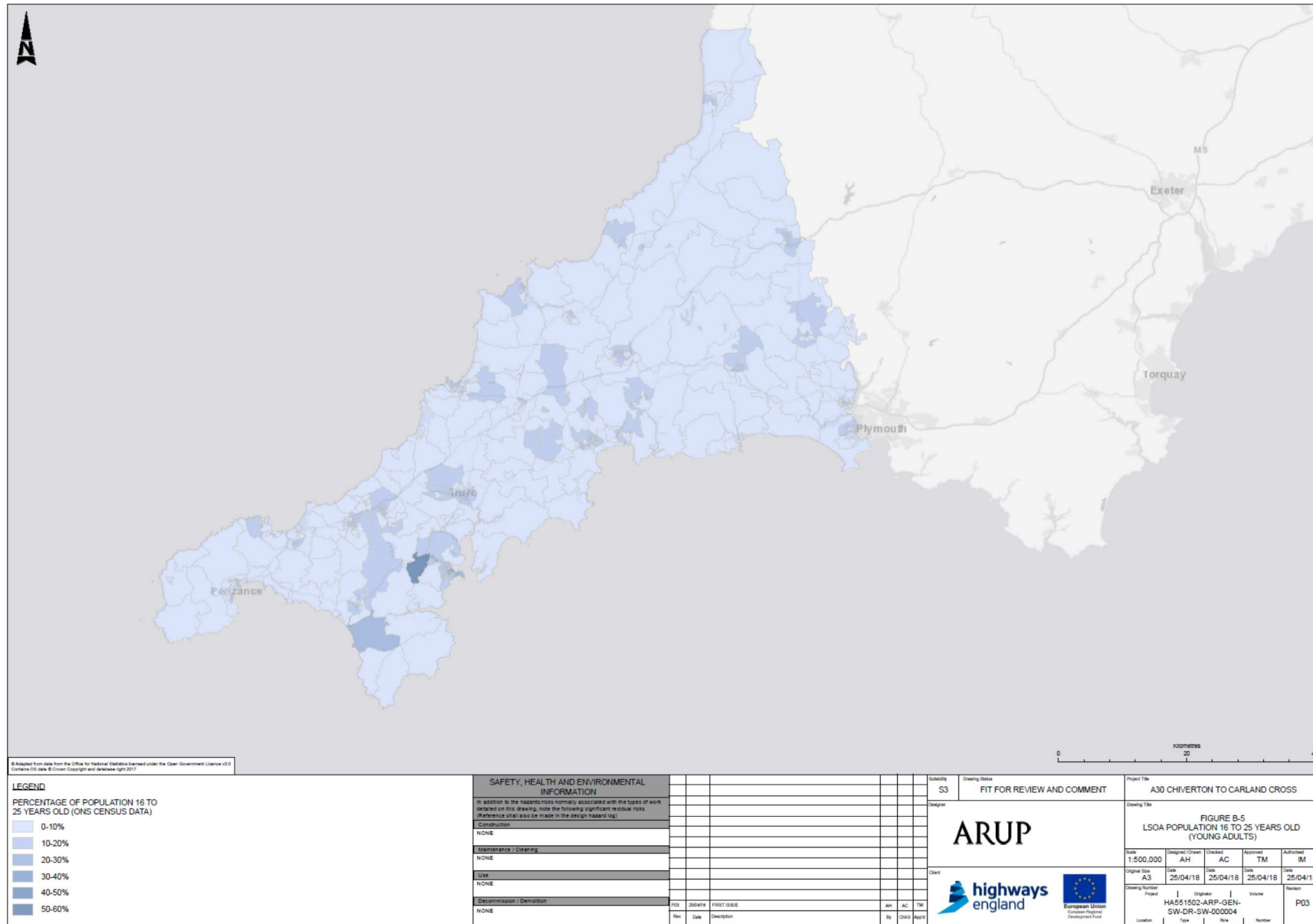
Figure B-5 LSOA population 16 to 25 years old (young adults)

Figure B-6   LSOA population over 65 years old (older people)

Figure B-7 Proportion of inhabitants with a disability

Figure B-8   Proportion of the population from Black or Minority Ethnic (BME) backgrounds

Figure B-9   Proportion of households without access to a car

Figure B-10 Proportion of households with dependent children

Table B-1 User Benefit Analysis Table

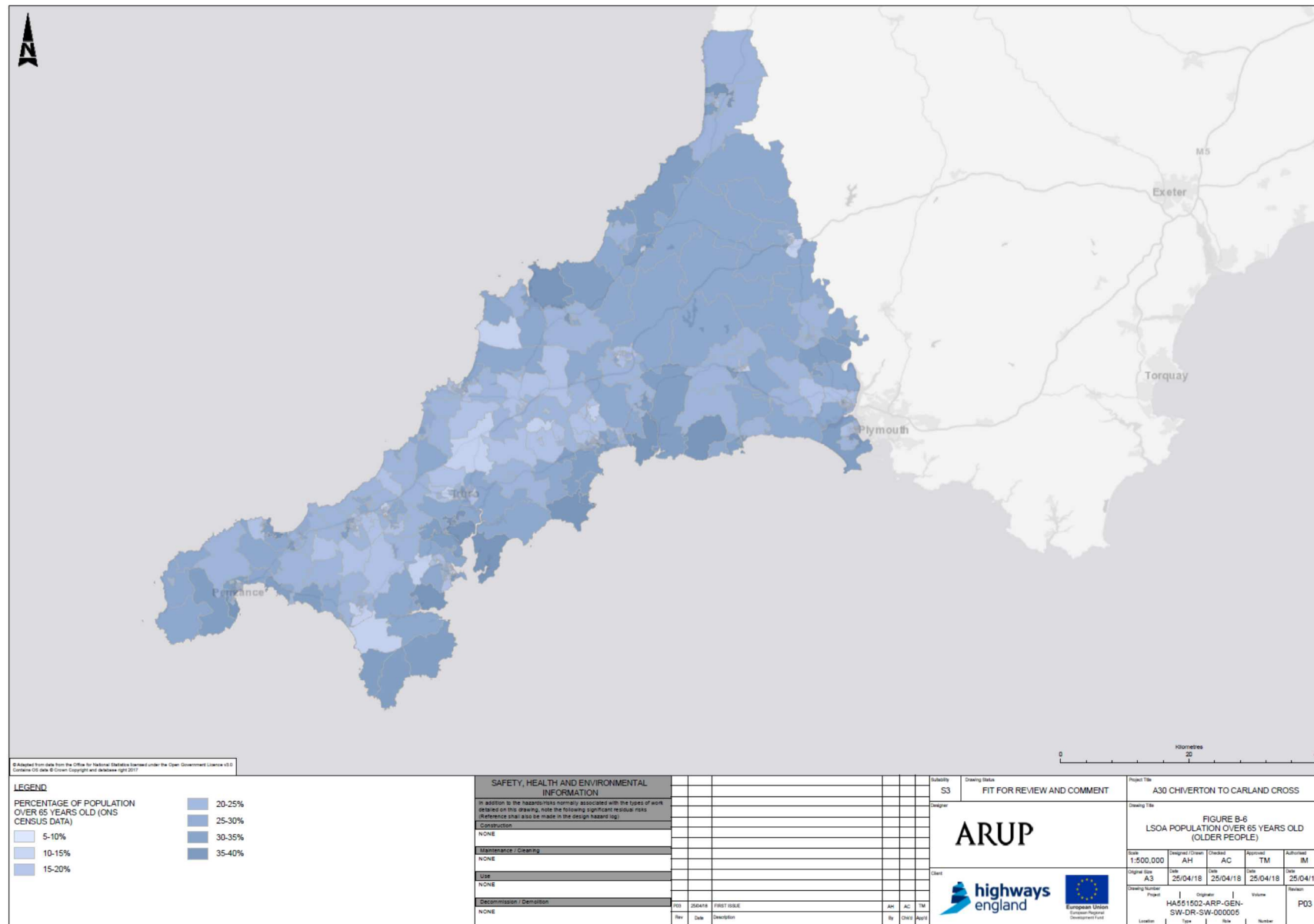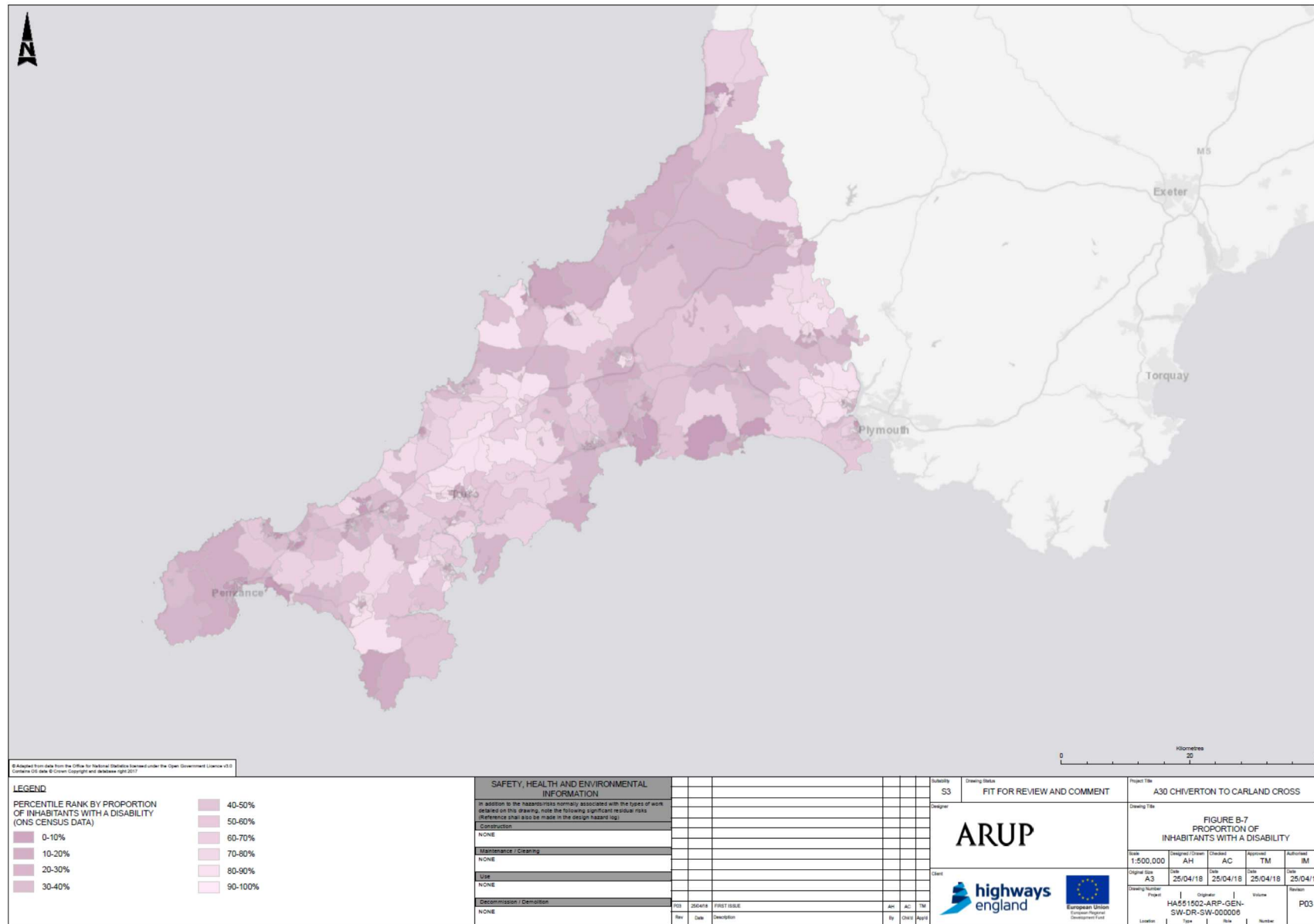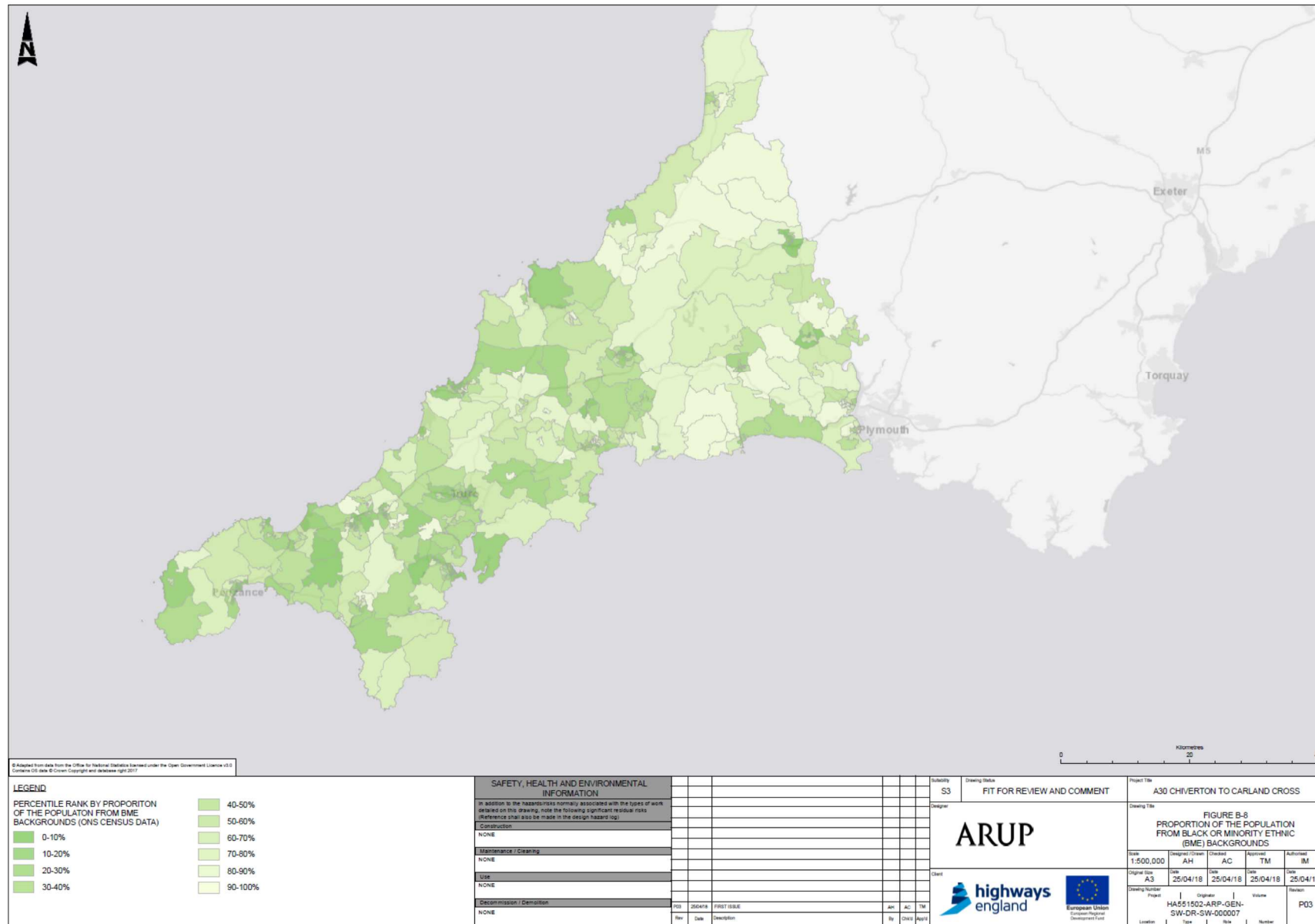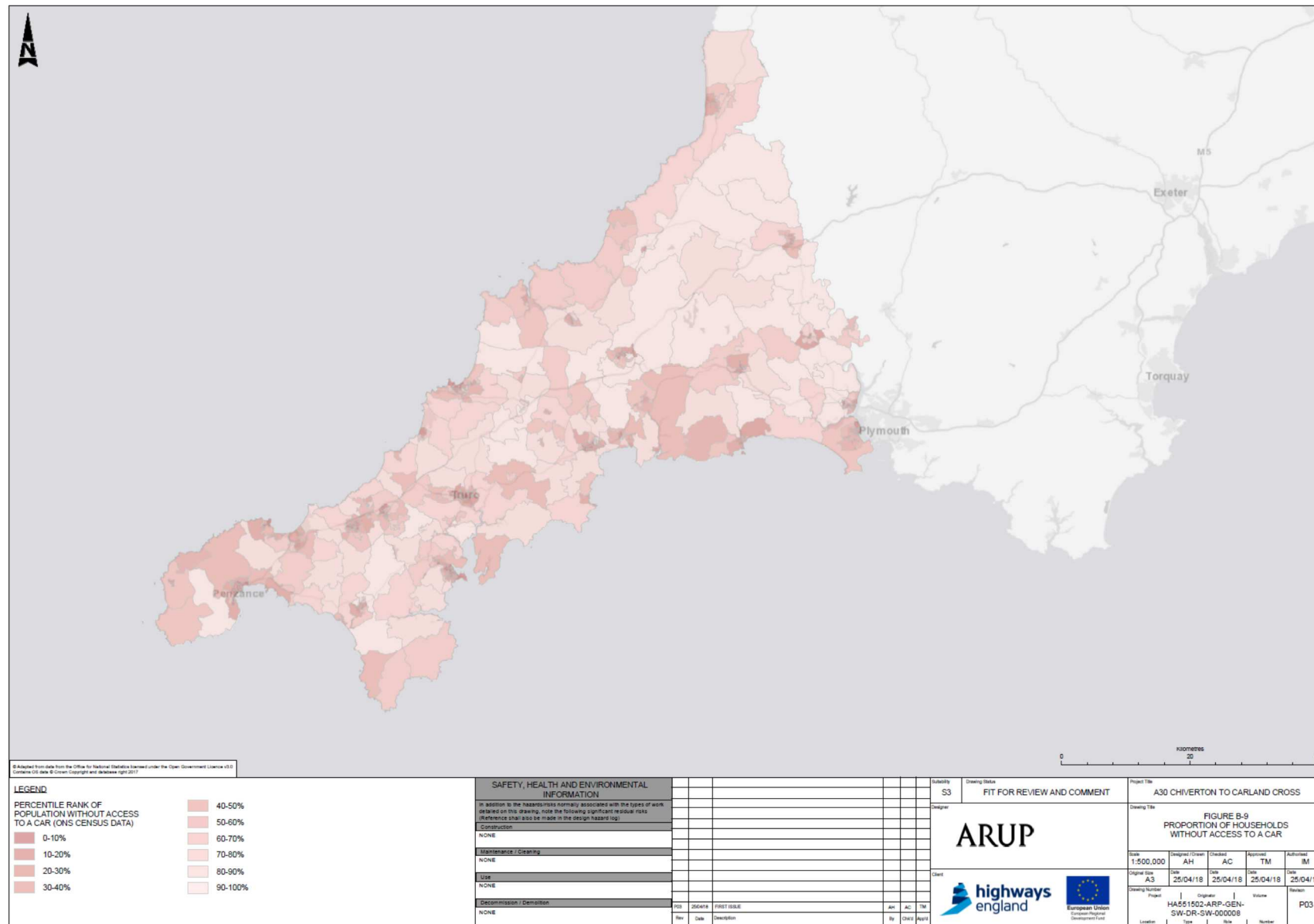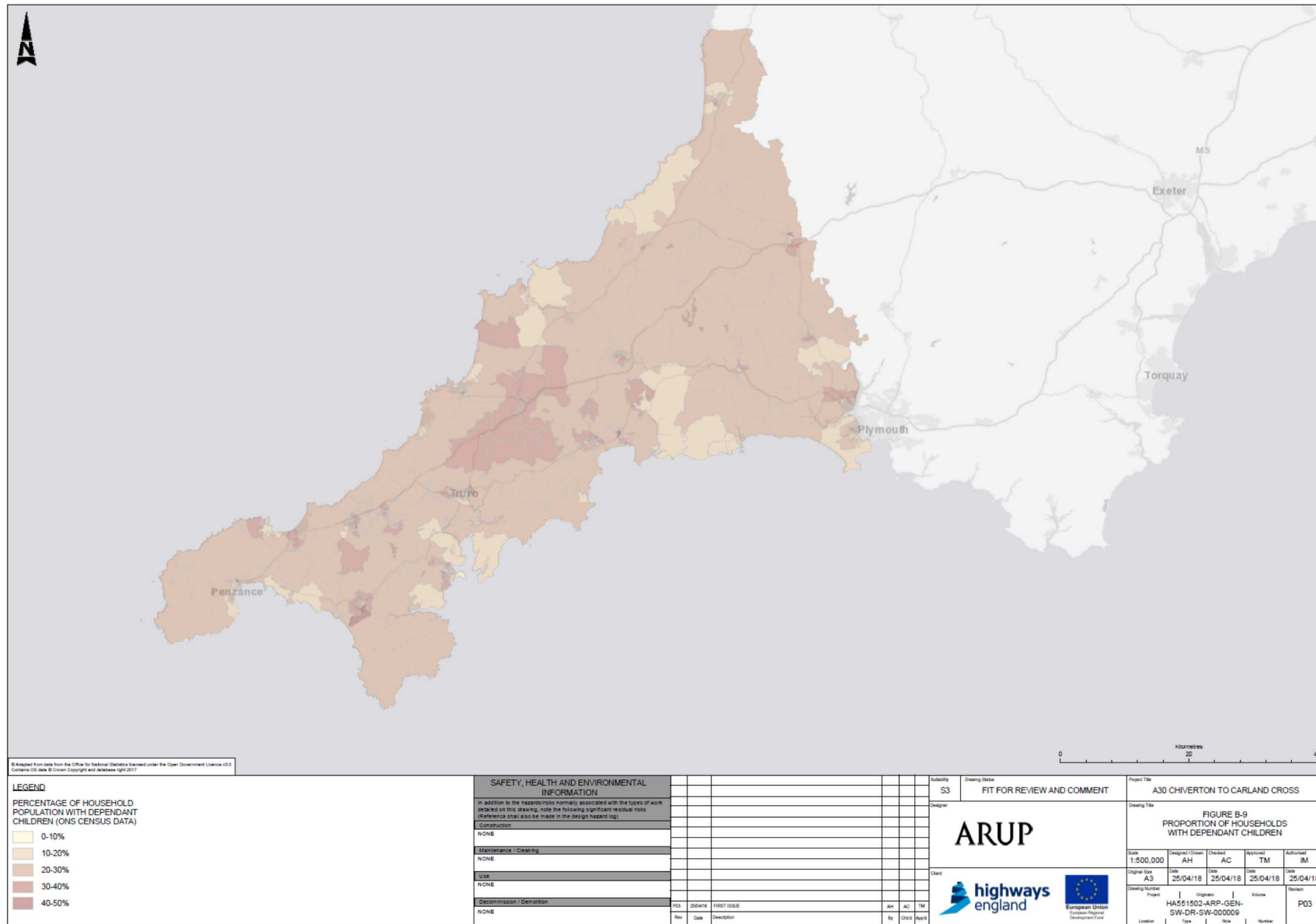|	IMD Income Domains					Total £000s
	Most deprived areas ⇔ Least deprived areas					
	0%<20%	20%<40%	40%<60%	60%<80%	80%<100%	
E01018901	0	0	0	365	0	365
E01018902	0	0	349	0	0	349
E01018903	0	0	0	0	592	592
E01018904	0	0	605	0	0	605
E01018905	0	0	391	0	0	391
E01018906	0	0	358	0	0	358
E01018907	0	344	0	0	0	344
E01018908	0	0	690	0	0	690
E01018909	0	0	1,951	0	0	1,951
E01018910	2,346	0	0	0	0	2,346
E01018911	2,102	0	0	0	0	2,102
E01018912	0	0	1,895	0	0	1,895
E01018913	0	0	2,327	0	0	2,327
E01018914	0	0	2,901	0	0	2,901
E01018915	0	0	2,815	0	0	2,815
E01018916	0	565	0	0	0	565
E01018917	0	0	1,243	0	0	1,243
E01018918	0	1,554	0	0	0	1,554
E01018919	0	0	1,243	0	0	1,243
E01018920	0	0	582	0	0	582
E01018921	0	0	605	0	0	605
E01018922	0	0	0	701	0	701
E01018923	0	0	0	351	0	351
E01018924	0	0	755	0	0	755
E01018925	0	0	187	0	0	187
E01018926	0	0	646	0	0	646
E01018750	0	0	103	0	0	103
E01018751	0	69	0	0	0	69
E01018752	0	0	96	0	0	96
E01018753	0	0	0	74	0	74
E01018754	0	70	0	0	0	70
E01018755	0	0	67	0	0	67
E01018756	0	0	77	0	0	77
E01018757	0	0	160	0	0	160
E01018758	0	290	0	0	0	290
E01018759	0	0	182	0	0	182
E01018760	0	0	148	0	0	148
E01018761	0	182	0	0	0	182
E01018762	0	0	135	0	0	135
E01018763	0	0	87	0	0	87
E01018764	0	0	0	112	0	112
E01018765	0	0	0	116	0	116
E01018766	0	0	345	0	0	345
E01018767	183	0	0	0	0	183
E01018768	0	251	0	0	0	251
E01018769	0	227	0	0	0	227
E01018770	149	0	0	0	0	149
E01018771	168	0	0	0	0	168
E01018772	0	0	185	0	0	185

E01018773	0	126	0	0	0	126
E01018774	113	0	0	0	0	113
E01018775	0	0	108	0	0	108
E01018776	0	86	0	0	0	86
E01018777	0	0	90	0	0	90
E01018778	0	0	138	0	0	138
E01018779	0	0	176	0	0	176
E01018780	0	183	0	0	0	183
E01018781	0	0	138	0	0	138
E01018782	0	0	178	0	0	178
E01018783	0	0	188	0	0	188
E01018784	0	0	177	0	0	177
E01018785	0	0	157	0	0	157
E01018786	0	0	0	101	0	101
E01018787	0	0	0	124	0	124
E01018788	0	114	0	0	0	114
E01018789	0	0	1,124	0	0	1,124
E01018790	0	979	0	0	0	979
E01018791	0	999	0	0	0	999
E01018792	0	0	0	2,315	0	2,315
E01018793	0	1,364	0	0	0	1,364
E01018794	0	0	109	0	0	109
E01018795	0	0	0	0	94	94
E01018796	0	0	0	0	98	98
E01018797	85	0	0	0	0	85
E01018798	0	0	118	0	0	118
E01018799	0	90	0	0	0	90
E01018800	0	0	0	124	0	124
E01018803	0	0	0	525	0	525
E01018804	0	0	0	587	0	587
E01018805	0	0	0	449	0	449
E01018806	0	0	0	464	0	464
E01018807	0	0	13,902	0	0	13,902
E01018808	0	0	1,690	0	0	1,690
E01018809	0	16,052	0	0	0	16,052
E01018810	0	0	0	0	3,659	3,659
E01018811	0	0	0	453	0	453
E01018812	0	423	0	0	0	423
E01018813	0	0	0	476	0	476
E01018814	0	0	431	0	0	431
E01018815	0	0	13,140	0	0	13,140
E01018816	0	0	0	0	926	926
E01018817	0	0	0	3,106	0	3,106
E01018818	0	0	2,394	0	0	2,394
E01018819	0	0	5,610	0	0	5,610
E01018820	0	0	1,655	0	0	1,655
E01018821	0	0	0	2,499	0	2,499
E01018822	0	0	0	728	0	728
E01018823	0	0	0	3,780	0	3,780
E01018824	0	0	6,341	0	0	6,341
E01018825	0	0	1,949	0	0	1,949
E01018826	0	0	5,739	0	0	5,739
E01018827	0	0	0	0	820	820
E01018828	0	0	833	0	0	833
E01018829	0	0	1,233	0	0	1,233
E01018830	0	0	0	1,359	0	1,359
E01018831	0	0	1,679	0	0	1,679

E01018832	0	0	0	776	0	776
E01018833	0	0	577	0	0	577
E01018834	0	0	384	0	0	384
E01018835	0	425	0	0	0	425
E01018836	348	0	0	0	0	348
E01018837	0	0	478	0	0	478
E01018838	484	0	0	0	0	484
E01018839	0	0	331	0	0	331
E01018840	0	0	490	0	0	490
E01018841	426	0	0	0	0	426
E01018842	0	0	2,103	0	0	2,103
E01018843	0	0	472	0	0	472
E01018844	0	1,806	0	0	0	1,806
E01018845	0	0	762	0	0	762
E01018846	0	0	107	0	0	107
E01018847	0	0	1,416	0	0	1,416
E01018848	0	0	0	819	0	819
E01018849	0	0	865	0	0	865
E01018850	0	0	0	652	0	652
E01018851	0	0	426	0	0	426
E01018852	0	0	0	1,140	0	1,140
E01018853	0	0	2,279	0	0	2,279
E01018854	5,074	0	0	0	0	5,074
E01018855	0	0	34,768	0	0	34,768
E01018856	0	865	0	0	0	865
E01018857	0	851	0	0	0	851
E01018858	0	0	1,178	0	0	1,178
E01018859	0	0	0	528	0	528
E01018860	567	0	0	0	0	567
E01018861	0	0	396	0	0	396
E01018862	0	0	494	0	0	494
E01018863	0	688	0	0	0	688
E01018864	0	0	0	702	0	702
E01018865	0	795	0	0	0	795
E01018866	0	701	0	0	0	701
E01018867	933	0	0	0	0	933
E01018868	0	779	0	0	0	779
E01018869	0	674	0	0	0	674
E01018870	579	0	0	0	0	579
E01018871	0	0	711	0	0	711
E01018872	0	537	0	0	0	537
E01018873	0	530	0	0	0	530
E01018874	0	568	0	0	0	568
E01018875	590	0	0	0	0	590
E01018876	0	0	580	0	0	580
E01018877	0	0	646	0	0	646
E01018878	704	0	0	0	0	704
E01018879	0	0	0	500	0	500
E01018880	0	0	622	0	0	622
E01018881	0	524	0	0	0	524
E01018882	0	0	0	408	0	408
E01018883	0	0	0	443	0	443
E01018884	0	0	0	471	0	471
E01018885	0	407	0	0	0	407
E01018886	0	0	0	555	0	555
E01018887	0	459	0	0	0	459
E01018888	0	612	0	0	0	612

E01018889	0	0	541	0	0	541
E01018890	0	630	0	0	0	630
E01018891	0	0	531	0	0	531
E01018892	0	0	612	0	0	612
E01018893	548	0	0	0	0	548
E01018894	0	0	782	0	0	782
E01018895	0	740	0	0	0	740
E01018896	0	0	654	0	0	654
E01018897	1,691	0	0	0	0	1,691
E01018898	552	0	0	0	0	552
E01018899	0	0	0	0	623	623
E01018900	0	0	451	0	0	451
E01018927	0	1,090	0	0	0	1,090
E01018928	1,258	0	0	0	0	1,258
E01018929	0	883	0	0	0	883
E01018930	1,114	0	0	0	0	1,114
E01018931	0	0	339	0	0	339
E01018932	0	1,138	0	0	0	1,138
E01018933	1,067	0	0	0	0	1,067
E01018934	0	0	1,448	0	0	1,448
E01018935	0	0	1,601	0	0	1,601
E01018936	0	0	85	0	0	85
E01018937	112	0	0	0	0	112
E01018938	0	95	0	0	0	95
E01018940	0	0	438	0	0	438
E01018941	0	0	446	0	0	446
E01018942	0	405	0	0	0	405
E01018943	0	0	128	0	0	128
E01018944	0	0	345	0	0	345
E01018945	0	0	0	380	0	380
E01018946	0	0	132	0	0	132
E01018947	0	0	301	0	0	301
E01018948	0	150	0	0	0	150
E01018949	120	0	0	0	0	120
E01018950	0	157	0	0	0	157
E01018951	0	0	135	0	0	135
E01018952	0	0	101	0	0	101
E01018953	0	0	102	0	0	102
E01018954	0	0	960	0	0	960
E01018955	0	0	1,061	0	0	1,061
E01018956	0	0	0	702	0	702
E01018957	0	0	851	0	0	851
E01018958	0	802	0	0	0	802
E01018959	0	0	0	85	0	85
E01018960	0	112	0	0	0	112
E01018961	0	0	89	0	0	89
E01018962	0	0	579	0	0	579
E01018965	0	0	220	0	0	220
E01018966	0	0	0	49	0	49
E01018967	0	0	0	65	0	65
E01018968	0	0	710	0	0	710
E01018969	0	0	620	0	0	620
E01018970	0	0	0	1,002	0	1,002
E01018971	0	0	1,348	0	0	1,348
E01018972	0	1,138	0	0	0	1,138
E01018973	0	0	915	0	0	915
E01018974	0	0	721	0	0	721

E01018975	0	0	717	0	0	717
E01018976	0	0	564	0	0	564
E01018977	368	0	0	0	0	368
E01018978	0	633	0	0	0	633
E01018979	0	0	576	0	0	576
E01018980	0	0	649	0	0	649
E01018981	0	0	896	0	0	896
E01018982	0	898	0	0	0	898
E01018983	0	0	668	0	0	668
E01018984	875	0	0	0	0	875
E01018985	0	0	0	1,012	0	1,012
E01018986	0	0	654	0	0	654
E01018987	0	0	867	0	0	867
E01018988	0	0	416	0	0	416
E01018989	0	485	0	0	0	485
E01018990	0	650	0	0	0	650
E01018991	0	399	0	0	0	399
E01018992	0	0	432	0	0	432
E01018993	0	428	0	0	0	428
E01018994	0	433	0	0	0	433
E01018995	548	0	0	0	0	548
E01018996	423	0	0	0	0	423
E01018997	385	0	0	0	0	385
E01018998	0	395	0	0	0	395
E01018999	407	0	0	0	0	407
E01019000	0	369	0	0	0	369
E01019001	0	435	0	0	0	435
E01019002	0	360	0	0	0	360
E01019003	0	0	0	471	0	471
E01019004	412	0	0	0	0	412
E01019005	0	565	0	0	0	565
E01019006	0	0	427	0	0	427
E01019007	0	807	0	0	0	807
E01019008	573	0	0	0	0	573
E01019009	0	642	0	0	0	642
E01019010	0	0	547	0	0	547
E01019011	0	0	681	0	0	681
E01019012	0	681	0	0	0	681
E01019013	0	695	0	0	0	695
E01019014	0	0	444	0	0	444
E01019015	0	0	0	482	0	482
E01019016	0	0	621	0	0	621
E01019017	0	0	0	0	1,800	1,800
E01019018	0	0	0	540	0	540
E01019019	0	0	509	0	0	509
E01019020	491	0	0	0	0	491
E01019021	0	0	509	0	0	509
E01019022	627	0	0	0	0	627
E01019023	0	0	546	0	0	546
E01019024	0	0	395	0	0	395
E01019025	0	0	0	381	0	381
E01019026	0	0	383	0	0	383
E01019027	0	0	390	0	0	390
E01019028	0	733	0	0	0	733
E01019029	496	0	0	0	0	496
E01019030	0	0	600	0	0	600
E01019031	0	0	985	0	0	985

E01019032	0	0	467	0	0	467
E01019033	459	0	0	0	0	459
E01019034	0	490	0	0	0	490
E01019035	0	0	300	0	0	300
E01019036	0	0	1,169	0	0	1,169
E01019037	0	285	0	0	0	285
E01019038	0	0	444	0	0	444
E01019039	0	0	0	560	0	560
E01019040	0	0	501	0	0	501
E01019041	563	0	0	0	0	563
E01019042	0	550	0	0	0	550
E01019043	0	449	0	0	0	449
E01019044	0	0	465	0	0	465
E01019045	0	0	783	0	0	783
E01019046	437	0	0	0	0	437
E01019047	0	436	0	0	0	436
E01019048	0	0	631	0	0	631
E01019049	0	3,751	0	0	0	3,751
E01019050	0	0	0	680	0	680
E01019051	0	566	0	0	0	566
E01019052	0	566	0	0	0	566
E01019053	0	581	0	0	0	581
E01019054	0	0	1,963	0	0	1,963
E01019055	1,552	0	0	0	0	1,552
E01019056	435	0	0	0	0	435
E01019057	0	0	524	0	0	524
E01019058	0	0	524	0	0	524
E01019059	0	398	0	0	0	398
E01019060	0	0	0	2,477	0	2,477
E01019061	0	0	2,681	0	0	2,681
E01019062	0	3,097	0	0	0	3,097
E01019063	0	0	1,609	0	0	1,609
E01019064	0	0	605	0	0	605
E01019065	0	0	3,867	0	0	3,867
E01019066	0	0	0	629	0	629
E01019067	0	0	0	479	0	479
E01019068	0	0	455	0	0	455
E01019069	0	389	0	0	0	389
E01019070	0	596	0	0	0	596
E01019071	0	0	469	0	0	469
E01019072	0	447	0	0	0	447
E01019073	0	0	451	0	0	451
E01019074	0	1,192	0	0	0	1,192
E01019075	0	0	93	0	0	93
E01019076	580	0	0	0	0	580
E01033289	0	0	0	1,458	0	1,458
E01033291	0	0	432	0	0	432
E01033292	412	0	0	0	0	412
E01033294	0	0	0	190	0	190
Total benefits (∑LSOAs)	**31,356**	**65,927**	**179,668**	**37,442**	**8,614**	**323,007**
Total disbenefits (∑LSOAs)						
Share of user benefits	10%	20%	56%	12%	3%	100%
Share of user disbenefits						
Share of population in impact area	12%	24%	46%	15%	3%	100%
Assessment	✔✔	✔✔	✔✔✔	✔✔	✔✔	

✓✓✓ Beneficial and 5% or more greater than the proportion of the group in the total population
✓✓   Beneficial and in line (+/-5%) with the proportion of the group in the total population
✓   Beneficial and 5% or more smaller than the proportion of the group in the total population
     There are no transport user benefits or disbenefits experienced
✗   A disbenefit which is 5% or more smaller than the proportion of the group in the total population
✗✗   A disbenefit which is in line (+/-5%) with the proportion of the group in the total population
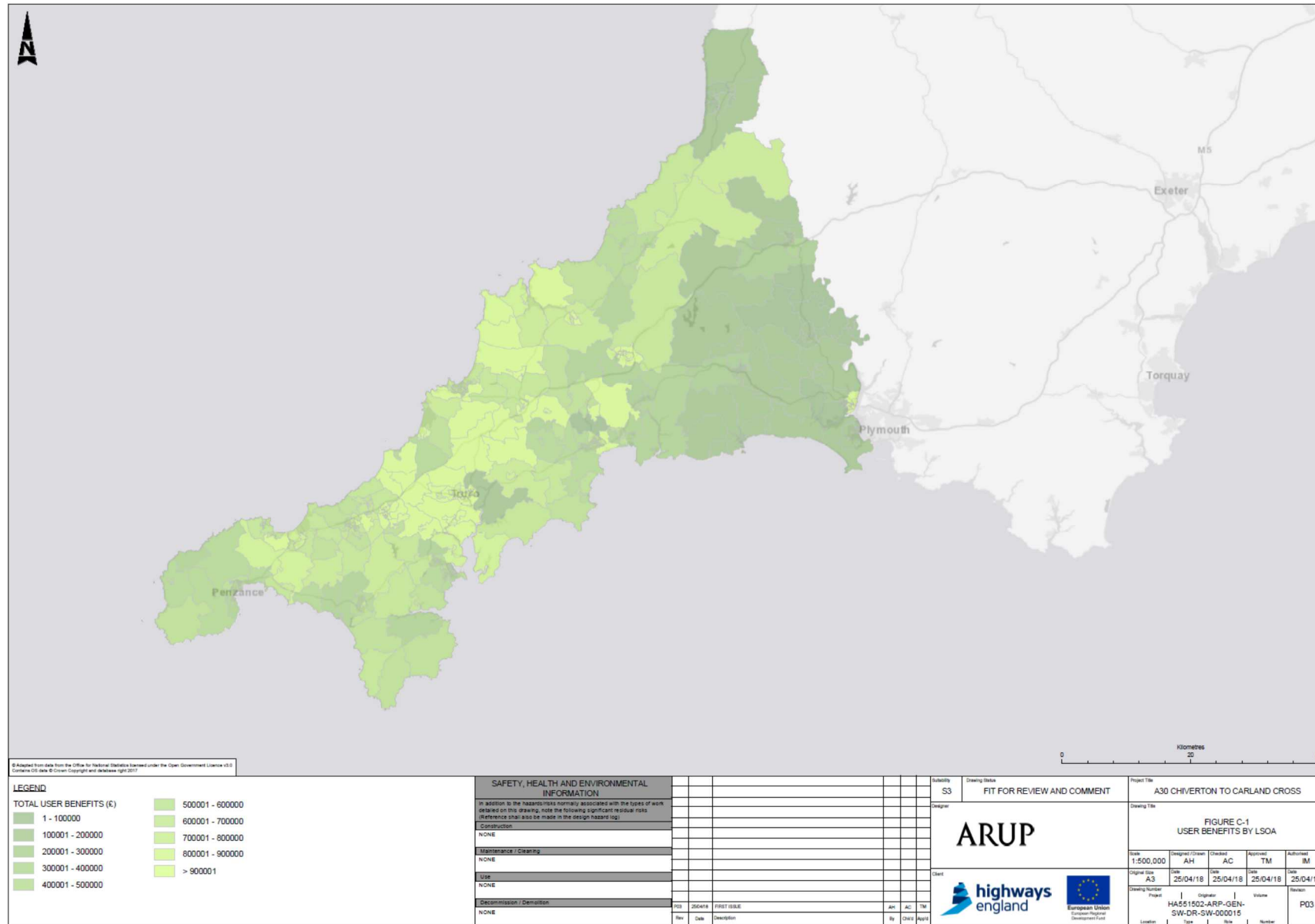✗✗✗ A disbenefit which is 5% or more greater than the proportion of the group in the total population

Figure B-11 User Benefits by LSOA

Table B-2 Personal Affordability

	IMD Income Domains (£000)					Total
	Most deprived areas ⇔ Least deprived areas					
	0%<20%	20%<40%	40%<60%	60%<80%	80%<100%	
E01018901	0	0	-13	0	0	-13
E01018902	0	0	0	0	0	-17
E01018903	0	0	0	0	0	-14
E01018904	0	0	0	-13	0	-13
E01018905	0	0	0	0	0	-17
E01018906	0	0	-13	0	0	-13
E01018907	0	-198	-19	0	0	-19
E01018908	0	0	-20	0	0	-20
E01018909	0	0	-203	0	0	-203
E01018910	-383	0	-123	0	0	-123
E01018911	-343	0	-126	0	0	-126
E01018912	0	0	0	0	0	-114
E01018913	0	0	-175	0	0	-175
E01018914	0	0	-70	0	0	-70
E01018915	0	0	-200	0	0	-200
E01018916	0	-172	-122	0	0	-122
E01018917	0	0	0	0	0	-116
E01018918	0	-476	-90	0	0	-90
E01018919	0	0	-206	0	0	-206
E01018920	0	0	0	0	0	-102
E01018921	0	0	0	0	0	-82
E01018922	0	0	0	0	0	-107
E01018923	0	0	-127	0	0	-127
E01018924	0	0	-69	0	0	-69
E01018925	0	0	-150	0	0	-150
E01018926	0	0	0	-29	0	-29
E01018750	0	0	0	-38	0	-38
E01018751	0	-40	2	0	0	2
E01018752	0	0	-163	0	0	-163
E01018753	0	0	0	3	0	3
E01018754	0	-41	2	0	0	2
E01018755	0	0	2	0	0	2
E01018756	0	0	0	1	0	1
E01018757	0	0	2	0	0	2
E01018758	0	-51	0	0	0	2
E01018759	0	0	0	2	0	2
E01018760	0	0	3	0	0	3
E01018761	0	-32	0	0	0	2
E01018762	0	0	2	0	0	2
E01018763	0	0	0	-43	0	-43
E01018764	0	0	0	0	0	-41
E01018765	0	0	-39	0	0	-39
E01018766	0	0	-45	0	0	-45
E01018767	-32	0	0	-99	0	-99
E01018768	0	-44	-182	0	0	-182
E01018769	0	-40	-226	0	0	-226
E01018770	-26	0	0	-249	0	-249
E01018771	-29	0	-53	0	0	-53
E01018772	0	0	-31	0	0	-31

E01018773	0	-61	-33	0	0	-33
E01018774	-55	0	-31	0	0	-31
E01018775	0	0	-60	0	0	-60
E01018776	0	-42	0	0	0	-40
E01018777	0	0	-56	0	0	-56
E01018778	0	0	-85	0	0	-85
E01018779	0	0	0	0	0	-53
E01018780	0	-89	0	0	0	-50
E01018781	0	0	-67	0	0	-67
E01018782	0	0	-74	0	0	-74
E01018783	0	0	0	0	0	-51
E01018784	0	0	0	0	0	-58
E01018785	0	0	0	0	0	-41
E01018786	0	0	0	0	0	-52
E01018787	0	0	-222	0	0	-222
E01018788	0	-55	0	0	0	-51
E01018789	0	0	0	0	0	-44
E01018790	0	-276	0	0	0	-40
E01018791	0	-282	-67	0	0	-67
E01018792	0	0	0	0	0	-32
E01018793	0	-385	0	0	0	-26
E01018794	0	0	0	0	0	-29
E01018795	0	0	-32	0	0	-32
E01018796	0	0	16	0	0	16
E01018797	-41	0	0	0	0	-1,155
E01018798	0	0	0	-377	0	-377
E01018799	0	-44	0	0	0	15
E01018800	0	0	0	-637	0	-637
E01018803	0	0	-689	0	0	-689
E01018804	0	0	0	0	0	-796
E01018805	0	0	125	0	0	125
E01018806	0	0	-396	0	0	-396
E01018807	0	0	-1,315	0	0	-1,315
E01018808	0	0	0	0	0	19
E01018809	0	-1,901	0	0	0	13
E01018810	0	0	15	0	0	15
E01018811	0	0	88	0	0	88
E01018812	0	-633	0	14	0	14
E01018813	0	0	13	0	0	13
E01018814	0	0	0	0	0	13
E01018815	0	0	13	0	0	13
E01018816	0	0	0	0	0	16
E01018817	0	0	14	0	0	14
E01018818	0	0	0	-54	0	-54
E01018819	0	0	0	-60	0	-60
E01018820	0	0	0	0	-46	-46
E01018821	0	0	0	0	-47	-47
E01018822	0	0	-77	0	0	-77
E01018823	0	0	-42	0	0	-42
E01018824	0	0	0	-56	0	-56
E01018825	0	0	-76	0	0	-76
E01018826	0	0	0	0	0	-371
E01018827	0	0	0	0	0	-401
E01018828	0	0	-794	0	0	-794
E01018829	0	0	0	0	0	-628
E01018830	0	0	0	-49	0	-49
E01018831	0	0	0	0	0	-55

E01018832	0	0	0	0	0	-276
E01018833	0	0	-53	0	0	-53
E01018834	0	0	-317	0	0	-317
E01018835	0	-534	0	0	0	-282
E01018836	-438	0	0	-654	0	-654
E01018837	0	0	0	0	0	-385
E01018838	-724	0	-298	0	0	-298
E01018839	0	0	-376	0	0	-376
E01018840	0	0	0	0	0	-283
E01018841	-638	0	0	0	0	-383
E01018842	0	0	-85	0	0	-85
E01018843	0	0	0	0	0	-401
E01018844	0	-61	-32	0	0	-32
E01018845	0	0	-26	0	0	-26
E01018846	0	0	0	0	0	-32
E01018847	0	0	-343	0	0	-343
E01018848	0	0	0	0	0	-55
E01018849	0	0	0	0	0	-41
E01018850	0	0	-57	0	0	-57
E01018851	0	0	0	0	0	-44
E01018852	0	0	0	-60	0	-60
E01018853	0	0	0	0	0	-269
E01018854	-485	0	0	0	0	-412
E01018855	0	0	-324	0	0	-324
E01018856	0	1	0	0	0	-308
E01018857	0	-220	-311	0	0	-311
E01018858	0	0	0	0	0	-88
E01018859	0	0	-106	0	0	-106
E01018860	-849	0	-106	0	0	-106
E01018861	0	0	0	0	0	-81
E01018862	0	0	-175	0	0	-175
E01018863	0	-209	71	0	0	71
E01018864	0	0	0	69	0	69
E01018865	0	-341	-524	0	0	-524
E01018866	0	-301	-101	0	0	-101
E01018867	-401	0	-71	0	0	-71
E01018868	0	-335	-45	0	0	-45
E01018869	0	-205	0	0	0	-61
E01018870	-249	0	0	0	0	-89
E01018871	0	0	-67	0	0	-67
E01018872	0	-163	0	-92	0	-92
E01018873	0	-161	-80	0	0	-80
E01018874	0	-244	0	-77	0	-77
E01018875	-253	0	-78	0	0	-78
E01018876	0	0	-79	0	0	-79
E01018877	0	0	0	0	0	53
E01018878	-303	0	34	0	0	34
E01018879	0	0	0	37	0	37
E01018880	0	0	47	0	0	47
E01018881	0	-301	0	0	-579	-579
E01018882	0	0	-24	0	0	-24
E01018883	0	0	0	0	0	-61
E01018884	0	0	-52	0	0	-52
E01018885	0	-234	0	0	0	-42
E01018886	0	0	36	0	0	36
E01018887	0	-264	0	0	0	37
E01018888	0	-352	60	0	0	60

E01018889	0	0	0	0	0	33
E01018890	0	-271	0	0	0	35
E01018891	0	0	0	0	0	43
E01018892	0	0	0	0	0	42
E01018893	-167	0	0	0	0	23
E01018894	0	0	36	0	0	36
E01018895	0	-318	0	0	0	33
E01018896	0	0	-421	0	0	-421
E01018897	-651	0	-1,296	0	0	-1,296
E01018898	-237	0	-368	0	0	-368
E01018899	0	0	0	-692	0	-692
E01018900	0	0	-78	0	0	-78
E01018927	0	-51	0	-98	0	-98
E01018928	-58	0	-88	0	0	-88
E01018929	0	-41	0	-72	0	-72
E01018930	-52	0	0	-84	0	-84
E01018931	0	0	-314	0	0	-314
E01018932	0	-53	0	-232	0	-232
E01018933	-50	0	-825	0	0	-825
E01018934	0	0	-303	0	0	-303
E01018935	0	0	0	0	0	-485
E01018936	0	0	-1,731	0	0	-1,731
E01018937	-17	0	0	-151	0	-151
E01018938	0	-14	-8,271	0	0	-8,271
E01018940	0	0	0	0	0	1
E01018941	0	0	0	0	0	-220
E01018942	0	-114	-180	0	0	-180
E01018943	0	0	569	0	0	569
E01018944	0	0	-81	0	0	-81
E01018945	0	0	0	0	0	-1,901
E01018946	0	0	0	0	-854	-854
E01018947	0	0	-165	0	0	-165
E01018948	0	-102	0	0	0	-271
E01018949	-82	0	-161	0	0	-161
E01018950	0	-107	-186	0	0	-186
E01018951	0	0	0	0	0	-167
E01018952	0	0	-210	0	0	-210
E01018953	0	0	-319	0	0	-319
E01018954	0	0	0	0	0	-383
E01018955	0	0	0	0	0	-343
E01018956	0	0	0	0	-402	-402
E01018957	0	0	0	-345	0	-345
E01018958	0	2	-266	0	0	-266
E01018959	0	0	-507	0	0	-507
E01018960	0	-17	0	-214	0	-214
E01018961	0	0	-87	0	0	-87
E01018962	0	0	-33	0	0	-33
E01018965	0	0	0	-94	0	-94
E01018966	0	0	-99	0	0	-99
E01018967	0	0	0	-75	0	-75
E01018968	0	0	-310	0	0	-310
E01018969	0	0	-380	0	0	-380
E01018970	0	0	-474	0	0	-474
E01018971	0	0	-460	0	0	-460
E01018972	0	2	0	0	0	-172
E01018973	0	0	-381	0	0	-381
E01018974	0	0	0	0	0	-476

E01018975	0	0	-381	0	0	-381
E01018976	0	0	-238	0	0	-238
E01018977	-119	0	0	0	0	-318
E01018978	0	-193	-281	0	0	-281
E01018979	0	0	0	0	0	-651
E01018980	0	0	0	0	0	-237
E01018981	0	0	0	0	0	-341
E01018982	0	-273	0	0	0	-301
E01018983	0	0	0	0	0	-401
E01018984	-266	0	0	0	0	-335
E01018985	0	0	0	0	0	-244
E01018986	0	0	0	0	0	-253
E01018987	0	0	-176	0	0	-176
E01018988	0	0	-278	0	0	-278
E01018989	0	-157	0	0	0	-303
E01018990	0	-413	0	0	0	-174
E01018991	0	-129	0	0	0	-195
E01018992	0	0	-166	0	0	-166
E01018993	0	-139	-207	0	0	-207
E01018994	0	-140	0	0	0	-207
E01018995	-178	0	0	0	0	-205
E01018996	-137	0	0	0	0	-249
E01018997	-125	0	-305	0	0	-305
E01018998	0	-128	0	0	0	-163
E01018999	-132	0	0	0	0	-161
E01019000	0	-120	0	0	-356	-356
E01019001	0	-141	-361	0	0	-361
E01019002	0	-117	-377	0	0	-377
E01019003	0	0	0	-416	0	-416
E01019004	-134	0	0	0	0	-193
E01019005	0	-183	-272	0	0	-272
E01019006	0	0	0	0	0	-273
E01019007	0	-513	-203	0	0	-203
E01019008	-174	0	0	0	0	-266
E01019009	0	-195	0	-308	0	-308
E01019010	0	0	-199	0	0	-199
E01019011	0	0	-264	0	0	-264
E01019012	0	-207	0	0	0	-209
E01019013	0	53	0	-213	0	-213
E01019014	0	0	-348	0	0	-348
E01019015	0	0	0	-403	0	-403
E01019016	0	0	-482	0	0	-482
E01019017	0	0	0	0	0	-534
E01019018	0	0	0	0	0	-438
E01019019	0	0	-601	0	0	-601
E01019020	13	0	-456	0	0	-456
E01019021	0	0	-175	0	0	-175
E01019022	16	0	-197	0	0	-197
E01019023	0	0	0	0	0	-413
E01019024	0	0	0	0	0	-513
E01019025	0	0	0	0	0	-724
E01019026	0	0	-495	0	0	-495
E01019027	0	0	-734	0	0	-734
E01019028	0	19	0	0	0	-638
E01019029	13	0	0	0	0	-849
E01019030	0	0	0	-786	0	-786
E01019031	0	0	0	-879	0	-879

E01019032	0	0	0	-672	0	-672
E01019033	35	0	0	-695	0	-695
E01019034	0	37	0	-679	0	-679
E01019035	0	0	0	0	0	-633
E01019036	0	0	0	-713	0	-713
E01019037	0	-283	-646	0	0	-646
E01019038	0	0	0	-790	0	-790
E01019039	0	0	-135	0	0	-135
E01019040	0	0	0	0	0	-157
E01019041	43	0	0	0	0	-129
E01019042	0	42	-138	0	0	-138
E01019043	0	23	0	-288	0	-288
E01019044	0	0	-358	0	0	-358
E01019045	0	0	0	0	-784	-784
E01019046	33	0	-675	0	0	-675
E01019047	0	33	0	-458	0	-458
E01019048	0	0	-183	0	0	-183
E01019049	0	-1,155	0	0	0	-119
E01019050	0	0	0	0	0	-140
E01019051	0	15	0	0	0	-137
E01019052	0	-371	0	0	0	-125
E01019053	0	-401	0	0	0	-178
E01019054	0	0	0	0	0	-128
E01019055	-628	0	0	0	0	-132
E01019056	-88	0	0	0	0	-141
E01019057	0	0	-140	0	0	-140
E01019058	0	0	0	0	0	-139
E01019059	0	-81	0	0	0	-183
E01019060	0	0	0	0	0	-120
E01019061	0	0	0	0	0	-117
E01019062	0	-796	0	-153	0	-153
E01019063	0	0	0	0	0	-134
E01019064	0	0	0	-235	0	-235
E01019065	0	0	0	-254	0	-254
E01019066	0	0	0	-271	0	-271
E01019067	0	0	0	0	0	-234
E01019068	0	0	0	-319	0	-319
E01019069	0	-269	0	0	0	-264
E01019070	0	-412	0	0	0	-352
E01019071	0	0	-228	0	0	-228
E01019072	0	-308	-314	0	0	-314
E01019073	0	0	-225	0	0	-225
E01019074	0	-383	-206	0	0	-206
E01019075	0	0	0	0	0	-198
E01019076	-401	0	0	0	0	-301
E01033289	0	0	-201	0	0	-201
E01033291	0	0	0	0	-341	-341
E01033292	-116	0	-348	0	0	-348
E01033294	0	0	-335	0	0	-335
Total benefits (∑LSOAs)						
Total disbenefits (∑LSOAs)	-8,907	-17,154	-38,485	-13,045	-3,409	-80,999
Share of user benefits						100%
Share of user disbenefits	11%	21%	48%	16%	4%	100%
Share of population in impact area	12%	24%	46%	15%	3%	100%
Assessment	✗✗	✗✗	✗✗	✗✗	✗✗	

Appendix C Accidents

Table C-1 Accidents (2012-2016) – Number of Occurences

Name	Number of Occurrences						
	Total	Children	Older People	Pedestrian	Cyclist	Motorcycl-ist	Young Male Driver
A392	46	0	7	5	3	1	1
A3058	56	1	5	0	1	0	0
Nancarrow-Shortlanesend	2	0	1	0	0	0	0
B3284 Shotlanesend - Truro	10	0	3	0	1	0	0
A30 - Inside Scheme	152	5	35	3	2	0	2
B3277 St Agnes	18	0	9	3	0	0	0
B3284 N Chybucca	10	0	2	0	0	0	0
B3284	68	0	9	3	2	0	1
A3075	106	1	23	2	4	0	0
B3285	27	0	6	1	0	1	0
A30 West of Scheme	104	1	23	3	4	1	2
B3284 S Chybucca	16	0	4	2	1	0	1
A390	168	2	27	9	4	0	1
A39	61	2	11	0	3	1	0
A3075	106	1	23	2	4	0	0
B3275	20	0	4	0	0	0	0
A393	34	0	2	2	2	0	0
B3285	20	0	2	1	0	0	0
Carland Services	5	1	0	0	1	0	1
A30 East of Scheme	104	1	23	3	4	1	2
B3300	21	0	6	2	0	1	0
B3298	45	0	9	2	2	0	0
A3047	19	0	5	0	3	0	0
Overall	**1218**	**15**	**239**	**43**	**41**	**6**	**11**

Table C-2 Accidents (2012-2016) - Percentage of total casualties

Name	% of total casualties					
	Children	**Older People**	**Pedestrian**	**Cyclist**	**Motorcycl-ist**	**Young Male Driver**
A392	0%	15%	11%	7%	2%	2%
A3058	2%	9%	0%	2%	0%	0%
Nancarrow-Shortlanesend	0%	50%	0%	0%	0%	0%
B3284 Shotlanesend - Truro	0%	30%	0%	10%	0%	0%
A30 - Inside Scheme	3%	23%	2%	1%	0%	1%
B3277 St Agnes	0%	50%	17%	0%	0%	0%
B3284 N Chybucca	0%	20%	0%	0%	0%	0%
B3284	0%	13%	4%	3%	0%	1%
A3075	1%	22%	2%	4%	0%	0%
B3285	0%	22%	4%	0%	4%	0%
A30 West of Scheme	1%	22%	3%	4%	1%	2%
B3284 S Chybucca	0%	25%	13%	6%	0%	6%
A390	1%	16%	5%	2%	0%	1%
A39	3%	18%	0%	5%	2%	0%
A3075	1%	22%	2%	4%	0%	0%
B3275	0%	20%	0%	0%	0%	0%
A393	0%	6%	6%	6%	0%	0%
B3285	0%	10%	5%	0%	0%	0%
Carland Services	20%	0%	0%	20%	0%	20%
A30 East of Scheme	1%	22%	3%	4%	1%	2%
B3300	0%	29%	10%	0%	5%	0%
B3298	0%	20%	4%	4%	0%	0%
A3047	0%	26%	0%	16%	0%	0%
Overall	**1%**	**20%**	**4%**	**3%**	**0%**	**1%**

Table C-3 National average accident statistics – Non- built-up road (>40mph)

Name	% of total casualties					
	Children	**Older People**	**Pedestrian**	**Cyclist**	**Motorcycl-ist**	**Young Male Driver**
A392	9%	9%	13%	10%	11%	9%
A3058	9%	9%	13%	10%	11%	9%
Nancarrow-Shortlanesend	9%	9%	13%	10%	11%	9%
B3284 Shotlanesend - Truro	9%	9%	13%	10%	11%	9%
A30 - Inside Scheme	9%	9%	13%	10%	11%	9%
B3277 St Agnes	9%	9%	13%	10%	11%	9%
B3284 N Chybucca	9%	9%	13%	10%	11%	9%
B3284	9%	9%	13%	10%	11%	9%
A3075	9%	9%	13%	10%	11%	9%
B3285	9%	9%	13%	10%	11%	9%
A30 West of Scheme	9%	9%	13%	10%	11%	9%
B3284 S Chybucca	9%	9%	13%	10%	11%	9%
A390	9%	9%	13%	10%	11%	9%
A39	9%	9%	13%	10%	11%	9%
A3075	9%	9%	13%	10%	11%	9%
B3275	9%	9%	13%	10%	11%	9%
A393	9%	9%	13%	10%	11%	9%
B3285	9%	9%	13%	10%	11%	9%
Carland Services	9%	9%	13%	10%	11%	9%
A30 East of Scheme	9%	9%	13%	10%	11%	9%
B3300	9%	9%	13%	10%	11%	9%
B3298	9%	9%	13%	10%	11%	9%
A3047	9%	9%	13%	10%	11%	9%

Table C-4 Existing casualty rate for vulnerable users

Name	Existing casualty rate for vulnerable users					
	Children	Older People	Pedestrian	Cyclist	Motorcycl-ist	Young Male Driver
A392	LOW	HIGH	MEDIUM	LOW	LOW	LOW
A3058	LOW	MEDIUM	LOW	LOW	LOW	LOW
Nancarrow-Shortlanesend	LOW	HIGH	LOW	LOW	LOW	LOW
B3284 Shotlanesend - Truro	LOW	HIGH	LOW	MEDIUM	LOW	LOW
A30 - Inside Scheme	LOW	HIGH	LOW	LOW	LOW	LOW
B3277 St Agnes	LOW	HIGH	MEDIUM	LOW	LOW	LOW
B3284 N Chybucca	LOW	HIGH	LOW	LOW	LOW	LOW
B3284	LOW	HIGH	LOW	LOW	LOW	LOW
A3075	LOW	HIGH	LOW	LOW	LOW	LOW
B3285	LOW	HIGH	LOW	LOW	LOW	LOW
A30 West of Scheme	LOW	HIGH	LOW	LOW	LOW	LOW
B3284 S Chybucca	LOW	HIGH	MEDIUM	LOW	LOW	LOW
A390	LOW	HIGH	LOW	LOW	LOW	LOW
A39	LOW	HIGH	LOW	LOW	LOW	LOW
A3075	LOW	HIGH	LOW	LOW	LOW	LOW
B3275	LOW	HIGH	LOW	LOW	LOW	LOW
A393	LOW	LOW	LOW	LOW	LOW	LOW
B3285	LOW	MEDIUM	LOW	LOW	LOW	LOW
Carland Services	HIGH	LOW	LOW	HIGH	LOW	HIGH
A30 East of Scheme	LOW	HIGH	LOW	LOW	LOW	LOW
B3300	LOW	HIGH	MEDIUM	LOW	LOW	LOW
B3298	LOW	HIGH	LOW	LOW	LOW	LOW
A3047	LOW	HIGH	LOW	HIGH	LOW	LOW