

# **M25 junction 28 improvement scheme**

**TR010029**

## **9.95 Addendum to the Case for the Scheme**

Rules 8(1)(b)

Planning Act 2008

Infrastructure Planning (Examination Procedure) Rules 2010

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## Planning Act 2008

### The Infrastructure Planning (Examination Procedure) Rules 2010

### M25 junction 28 scheme Development Consent Order 202[x ]

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#### 9.95 Addendum to the Case for the Scheme

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# 1. Introduction

## 1.1 Summary

- 1.1.1 This addendum updates and replaces Chapter 4 of the Case for the Scheme (APP-095) which was submitted with the application (the “Application”) made by Highways England (the “Applicant”) to the Planning Inspectorate, acting on behalf of the Secretary of State for Transport, under Section 37 of the Planning Act 2008 (as amended) (“PA 2008”).
- 1.1.2 The Application is for the M25 junction 28 improvement scheme (the “Scheme”) and seeks a Development Consent Order (“DCO”) to construct, operate and maintain the Scheme. The Scheme crosses the administrative boundaries of the London Borough of Havering (“LBH”) and Brentwood Borough Council. The land to the east of the junction is situated in Brentwood Borough Council (“BBC”) while the land to the west is in LBH. The Scheme also falls within the regional jurisdiction of Essex County Council (“Essex CC”) and the Greater London Authority (“GLA”).
- 1.1.3 The Scheme is located between Brentwood and Romford in Essex. Junction 28 provides the intersection between the M25 motorway, the key trunk route of the A12 and A1023, providing connectivity between London and Chelmsford, Ipswich and Brentwood and other key destinations across the South East of England. The junction caters for several dominant movements particularly between the M24 motorway and the A12 towards Essex. The Government announced its commitment to improving the junction in its first Road Investment Strategy (RIS) published in 2014 for the investment period 2015 to 2020 and then again in its second Road Investment Strategy published in March 2020 (RIS2). The Scheme is described in RIS2 as an ‘upgrade of the junction between the M25 and A12 in Essex, providing a free-flowing link from the northbound M25 to the eastbound A12’.
- 1.1.4 The purpose of this Addendum is to replace Chapter 4 of the Case for the Scheme which relates to the economic case for the Scheme and has been updated to reflect performance under the most recent proposed signal timings at the junction that alter the user benefits due to the Scheme, explained in section 2 of the Transport Assessment Supplementary Information Report (PDB-003). These are the only amendments to the Case for the Scheme and the changes made to Chapter 4 have been indicated as tracked changes below.
- 1.1.5 This addendum should be read in conjunction with the Case for the Scheme submitted with the Application (APP-095).

## 4. The Economic Case

- 4.1.1 This chapter outlines the economic assessment of the Scheme. The anticipated benefits and dis-benefits of the Scheme together with the overall value for money are presented.
- 4.1.2 The economic case for the Scheme demonstrates its compliance with the NPS NN objective that strategic highway improvements benefit the economy. It assesses and monetises anticipated economic, environmental and social benefits of the Scheme based on a 60-year appraisal period, in accordance with DfT guidelines.
- 4.1.3 Table 4.1 summarises the monetised impacts of the Scheme. Benefits identified as Level 1 are those which have the highest degree of certainty from analytical techniques and contribute to the initial Benefit Cost Ratio (“BCR”) which is the amount of benefit being brought for every £1.00 of cost to the public purse. Level 2 benefits include the assessment of wider impacts and reliability benefits. These have more recently become known as ‘Established Monetised Impacts’ for Level 1 and ‘Evolving Monetised Impacts’ for Level 2.
- 4.1.4 In this case, to take a proportionate approach, Level 2 wider impacts have been assessed only where their calculation is directly related to elements of the Level 1 benefits. No assessment has been made of Level 3 benefits, which would capture impacts of the Scheme on land use change. This is a complex area of analysis to undertake and the impacts of a junction improvement, such as that at Junction 28 which provides limited local connectivity improvements, will have relatively low impacts on land use change.

**Table 4.1: Summary of present value monetised benefits**

Benefits			Monetised value, £m PV	
			Level 1	Level 2
Environmental benefits	Greenhouse gas emissions		£1.73m	N/A
	Noise		£0.02m	N/A
	Air quality		£0.04m	N/A
Social / economic benefits	Accidents		£2.34m	N/A
	Economic Efficiency of Transport System (TEE) Table	Commuting	£90.36m	N/A
		Other	£66.43m	N/A
		Business	£136.11m	N/A
	Wider public finances (Indirect Tax)		£8.29m	N/A
	Disruption during construction		£1.47m	N/A
	Reliability benefits		N/A	£0.01m
	Change to imperfect markets		N/A	£13.61m
	Agglomeration		N/A	N/A
Total Level 1		Present Value Benefits	£283.77m	
Wider Impacts			N/A	£9.13m

Benefits		Monetised value, £m PV	
		Level 1	Level 2
<b>Total Level 2</b>	Total of Level 1 Benefits and Wider Impacts	N/A	£297.39m

4.1.5 The non-monetised environmental and social benefits of the Scheme are summarised in Table 4.2.

4.1.6 The assessment of social and distributional impacts has been carried out in accordance with the latest TAG databook, whereby WebTAG worksheets have been completed for all environmental indicators. Air Quality, greenhouse gases and noise impacts are already included in the monetised benefits.

**Table 4.2: Summary of non-monetised benefits**

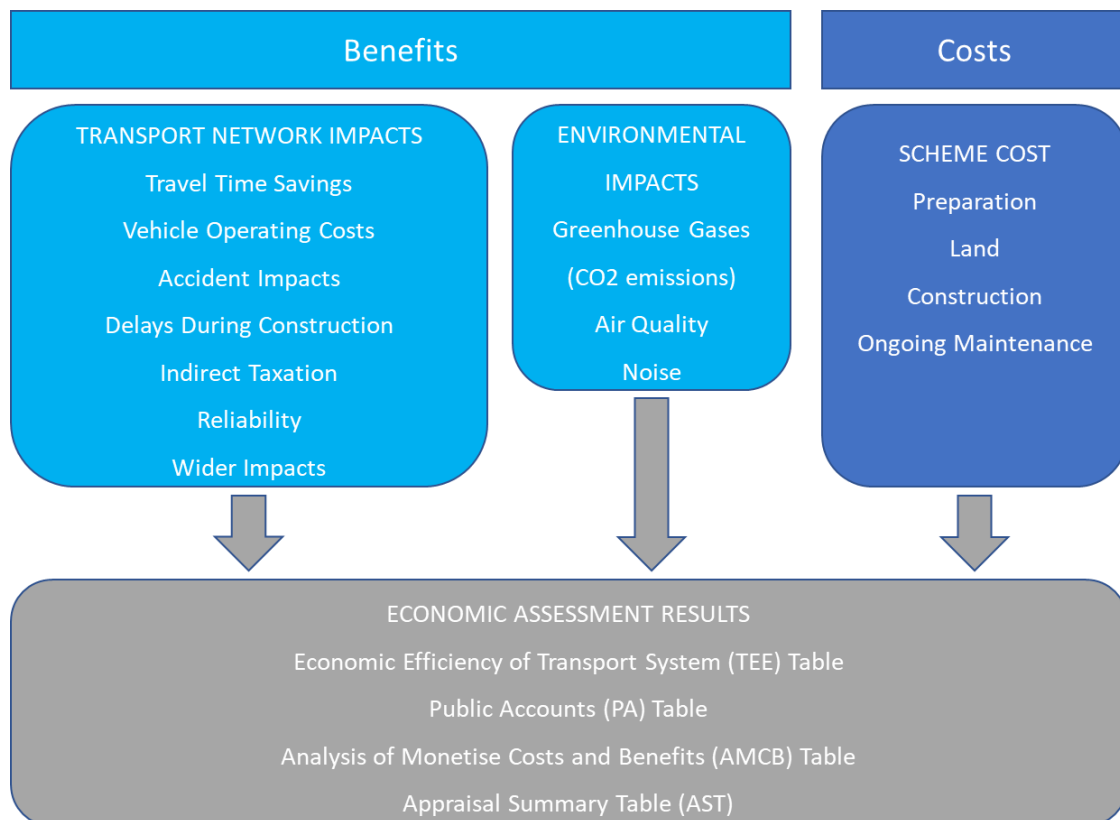
Benefits		Qualitative	Distributional impact
<b>Environmental benefits</b>	Noise	N/A	Neutral
	Air quality	N/A	Slight Adverse
	Landscape	Slight Adverse	N/A
	Historic environment	Slight Adverse	N/A
	Biodiversity	Slight Adverse	N/A
	Water environment	Neutral	N/A
	Townscape	N/A	N/A
<b>Social benefits</b>	Physical activity	Neutral	N/A
	Journey quality	Moderate Beneficial	N/A
	Accidents	N/A	Neutral
	Security	Neutral	N/A
	Accessibility	Neutral	N/A
	Affordability	Moderate Beneficial	Moderate Beneficial
	Severance	Neutral	Neutral
	Options and non-use values	Neutral	N/A
	Commuting & other users	N/A	Moderate Beneficial

## 4.2 Economic assessment methodology

4.2.1 The economic assessment was carried out in line with the DfT's Transport Appraisal Guidance, WebTAG, which itself is based on the principles in the Treasury's Green Book.

4.2.2 The assessment considers the calculation of impacts, both positive and negative, that are typically expressed in monetary terms. This includes the capital and maintenance cost of the Scheme and compares them against benefits such as travel time and accident savings and tax revenues generated by the Scheme.

- 4.2.3 Details of the cost and benefit elements<sup>1</sup> captured and how they contribute to the key output tables required for the reporting of economic impacts are set out Figure 4.1.
- 4.2.4 The transport and environmental benefits set out above have been assessed using approaches set out in Table 4.3. Costs have been prepared and provided by the Applicant.



**Figure 4.1: Economic assessment components**

- 4.2.5 Costs and benefits occur throughout the duration of the assessment period; the construction costs occur before the Scheme opens whilst the benefits and maintenance costs occur in the 60 years following completion of the Scheme. Costs and benefits are discounted to present values, i.e. benefits accrued today are considered to be of greater value than those accrued further into the future. As such the stream of costs and benefits are discounted to 2010 using the DfT standard discount rate.
- 4.2.6 Scheme costs and monetised impacts are summed to produce a BCR. Once impacts that can be expressed in monetary terms have been calculated, the assessment captures the remaining impacts that cannot be monetised within the Appraisal Summary Table ("AST"). The AST is a summary for decision makers containing key economic, environmental and other information drawn from existing documents. Together all this information can then be used to determine the value for money of the Scheme.

<sup>1</sup> Note that both benefits and costs will include any negative as well as positive impacts, where "benefits" include all impacts on transport users and wider society, while "costs" capture impacts on the public sector budget.

**Table 4.3: Benefit assessment methodology**

Element of benefit	Method of quantification
Travel time savings, vehicle operating costs and indirect tax	Assessed using DfT's TUBA tool v1.9.11 applied to with and without scheme traffic (SATURN) modelling. This assessment has captured the network change involved in the introduction of the Lower Thames Crossing.
Delays during construction	Assessed using the same approach as above, with modelling reflecting temporary traffic management arrangements necessary while construction is underway and the programme of closures.
Accident benefits	Captured using the COBA-LT tool, based on recorded incident data at an around the junction
Reliability benefits	Measured in relation to reduced incidents on the junction, using operational traffic (VISSIM) modelling to assess impacts of lane closures on delays. This assessment has been based on average delay periods from the local data, typical impacts on lane closures and frequency of incidents.  Unlike delays during construction for which advance warning will be given and rerouting possible, the impact of accidents is treated as unpredictable with minimal scope to divert.
Wider impacts	These include changes to imperfectly competitive markets – the impact on businesses of reducing costs of production and hence inducing additional investment. These benefits are calculated in line with TAG as a percentage uplift on business user benefits
Greenhouse gases	Based on DfT's Greenhouse Gases workbook
Noise	Based on DfT's Noise workbook
Air Quality	Based on DfT's Air Quality Valuation workbook

## 4.3 Scheme costs

- 4.3.1 Scheme cost estimates were based on a January 2019 forecast. For economic appraisal purposes these have been rebased to 2010 prices and presented as factor prices. These were converted to Present value of costs ("PVC") by discounting to 2010 values. This re-basing is a conversion of units, from the current prices at which costs have been calculated, to base year prices. Alongside the conversion to a PVC, this enables schemes assessed at different times to be directly compared.
- 4.3.2 The estimated capital cost over the 60-year appraisal period is £70m (Present Value). This value includes quantified allowances for risks which includes consideration of historic overspends on the Applicant's schemes and no additional allowance is therefore made for optimism bias.
- 4.3.3 Incremental operational and maintenance costs for economic appraisal purposes have been estimated, based on the additional pavement construction and standard maintenance cost rates. These were converted to Present Value of Costs ("PVC") by discounting to 2010 values and converting to market prices. The estimated incremental operational and maintenance cost over the 60-year appraisal period is £1m (Present Value).



- 4.3.4 The total estimated cost over the 60-year appraisal period, presented as a PVC, is therefore £70.56m.
- 4.3.5 This value equates to the outturn cost of £116.1m. This presentation of the cost includes all inflation up to the point of those costs being incurred, is not discounted and is in factor costs rather than market prices. The outturn value excludes portfolio risk related to the scheme. It also excludes ongoing maintenance costs.

## 4.4 Monetised benefits

### Level 1 Transport user benefits

- 4.4.1 The Scheme will provide additional network capacity on the SRN necessary to accommodate future development and predicted traffic growth. This will benefit business users (both car and freight) due to reductions in congestion. Almost half of the journey time benefits occur for this group (£124.60m). Overall business benefit also includes vehicle operating cost savings (£11.84m) but is reduced because of the impact of construction disbenefits (£0.60m).
- 4.4.2 There is a disbenefit to the Government due to a reduction in congestion. Fuel consumption is reduced slightly, thereby decreasing indirect tax revenues.

### Environmental benefits

- 4.4.3 A quantitative assessment has led to the monetisation of the following environmental benefits:
- Noise
  - Local Air Quality
  - Greenhouse Gases (“GHG”)
- 4.4.4 At Scheme opening most properties will be subject to negligible decrease in noise levels. No change is expected at 355 properties and a further 167 properties will be subject to a negligible increase in noise level. It is also predicted that the noise levels at NIAs would change by less than 1dB LA10,18h in the opening year of the Scheme.
- 4.4.5 Over the long-term for most of the receptors, the pattern of long-term changes to road traffic noise levels with and without the Scheme are similar, with most receptors being subject to negligible increase in noise levels. With the Scheme it is predicted that 911 properties will be subject to a negligible increase in noise level. At 48 properties the prediction shows no change in noise level and further 106 will be subject to negligible decrease. Also, no long-term noise increases greater than 1 dB LA10,18hr were predicted at any of the NIAs in the study area.
- 4.4.6 Net present value of change in noise is -£21,590. This value has been derived using the TAG “Noise Workbook” to monetise the values of change to noise during the daytime and night-time periods compared to the “without-scheme” scenario.
- 4.4.7 In the opening year there is an overall net deterioration in terms of PM2.5 concentrations, but a net improvement in NO2 concentrations due to the Scheme, as indicated by the increase and decrease in the net total assessment scores for PM2.5 and NO2 respectively.

- 4.4.8 The Scheme is located within the London Borough of Havering AQMA and Brentwood AQMA No.2 which incorporates Brook Street and the A12. The TAG assessment demonstrates a small negative impact on NO<sub>2</sub> and PM<sub>2.5</sub> concentrations within the AQMAs although this is not considered a significant effect. Initially the impact on local air quality is forecast to be positive, due to reduced delays, but the extra capacity leads to faster growth in traffic, with negative longer-term impacts on air quality arising.
- 4.4.9 The Net Present Values ("NPV") of these air quality impacts over the appraisal period is a net benefit of £36k, as the NPV calculation places a higher weight on the early positive impacts than on the later negative impacts. Sensitivity analysis shows the net benefit could range between £123k and £7k. Although the Scheme leads to an increase in the number of vehicles using this section of the road network, congestion relief results in more efficient use of fuel and lower emissions.
- 4.4.10 There is an overall increase in CO<sub>2</sub> emissions with the Scheme over the 60 year appraisal period, due to increases in total annual vehicle kilometres travelled. Calculated using the non-TUBA method, which captures variable journey speeds by link rather than using an averaged speed, the change in non-traded carbon dioxide emissions in 2022 is +357 tCO<sub>2</sub>e indicating an increase in CO<sub>2</sub> emissions in opening year. Change in emissions in tCO<sub>2</sub>e for the 60 year appraisal period is +38k.

### Social benefits

- 4.4.11 The Scheme will benefit commuting and other users due to reductions in congestion. These users will receive just over half of the net benefit from travel time change (£156.46m). The overall benefit also includes a small vehicle operating cost benefit (£0.33m) and is also reduced because of construction disbenefits (£0.87m).
- 4.4.12 An assessment of the accident cost savings was undertaken in accordance with WebTAG through the use of the COBA-LT software.
- 4.4.13 Total accident benefits generated by the Scheme over the 60-year assessment period amount to £2.34million.
- 4.4.14 There is a net accident saving due to the redistribution of traffic on to network links with lower accident rates. It is estimated that 63 accidents will be saved over the 60 year period of assessment. The casualties saved by the Scheme over the period are 1 fatal, 4 serious and 83 slight injury.
- 4.4.15 It should be noted that this analysis considers the change in accidents on the road network due to the changes in traffic flows. It does not consider any further detail design measures that could be introduced to reduce the likelihood of, and severity of, accidents.

### Initial BCR

- 4.4.16 The initial BCR contains all costs and benefits that are routinely quantified within economic assessments of transport schemes. Details of which elements of the assessed benefit are included in the initial BCR are set out in Table 4.1 as Level 1 benefits.

- 4.4.17 The Level 1 Present Value of Benefits (“PVB”) for the Scheme is £283.77m. With a PVC of £70.56m, the NPV is £213.21m and the BCR is 4.02.

### Level 2 Transport user benefits

- 4.4.18 The Scheme is forecast to generate wider economic impacts, but they are anticipated to be modest in scale as a result of the characteristics of the Scheme and its impact on travel costs and the economic characteristics of the area.
- 4.4.19 A qualitative assessment indicated the agglomeration and labour market impacts will provide a slight positive uplift on the benefits. The complexity of analysis required to monetise the impacts was therefore not considered proportionate to undertake at this stage of assessment.
- 4.4.20 Although the junction has been identified as a potential source of future capacity constraints leading to delays to traffic, it places no immediate constraint on specific sites on which land use development could otherwise occur. The increased capacity is not therefore considered to generate any direct dependent development benefits. Such benefits would suggest it enables land use change which was not possible without the Scheme at this stage.
- 4.4.21 An estimate of the impact of increased output in imperfectly competitive markets (reflecting the additional margin that firms can make on each additional unit of output they can produce as a result of travel cost savings) has been derived directly from the estimated business user benefits.
- 4.4.22 The Scheme does not directly affect travel to, from, or within a regeneration area and therefore an assessment of regeneration impacts in accordance with WebTAG Unit A2-1 has not been carried out.

### Adjusted BCR

- 4.4.23 An adjusted (or Level 2) BCR for the Scheme has been calculated which includes all benefits and costs associated with the initial BCR but also incorporates the benefits generated through journey time reliability improvements, as well as those defined as wider economic benefits. This provides a broader view of the value of the Scheme, giving a BCR of 4.21.
- 4.4.24 Details of assessment of these benefits are set out in the TA (application document TR010029/APP/7.4).

## 4.5 Non-monetised benefits

### Environmental, social and distributional benefits

#### Landscape

- 4.5.1 As noted within the Landscape chapter (Chapter 9) of the ES (application document TR010029/APP/6.1), the landscape pattern around the junction, the M25 and A12 is not expected to alter significantly. Overall, noise levels would not change noticeably as a result of the Scheme so tranquillity would not change. Small areas of woodland would be lost to new or widened highways and associated infrastructure as detailed within the Landscape chapter of the ES. Changes to landcover would also be experienced as a result of habitat enhancement in the area surrounding the Scheme but this would introduce new

areas of habitats mitigation in this area. The proposed Scheme would slightly increase the pre-existing conflict with the local landscape character as new elements would conflict with the key attributes of the local landscape including landform and presence of woodland areas. Over time with proposed mitigation, the Scheme would become integrated within the existing landscape. However, a permanent alteration to the landscape character will remain perceptible at the local scale.

#### Historic environment

- 4.5.2 The construction of the Scheme would remove known and as-yet unknown archaeological remains thought to be of low to medium value as identified in Chapter 11 of the ES (application document TR010029/APP/6.1). These impacts would be mitigated through a programme of archaeological works for preservation by record, resulting in a residual slight adverse effect as set out within the Register of Environmental Actions and Commitments ("REAC") (application document TR010029/APP/7.2).

#### Biodiversity

- 4.5.3 The Scheme would result in the permanent loss of habitats beneath the permanent footprint and temporary loss of habitats during the construction phase. Two veteran trees (considered to be irreplaceable habitat) would be permanently lost, while a further eight veteran trees within construction working areas would be retained, resulting in moderate adverse effect. Efforts have been made within the design to avoid veteran trees including proposed departures from Highways Standards where necessary. However, there are no feasible design options available to retain these two trees as set out in further detail in Appendix C. Small scale permanent loss of habitat and additional temporary loss of habitat within Ingrebourne Valley Site of Metropolitan Importance for Nature Conservation (SMI) and along the Ingrebourne River and Weald Brook would be mitigated and compensated for through appropriate reinstatement and enhancement of habitats, and long-term management of habitats. Due to the permanent loss of habitats, slight adverse residual effect is expected for Ingrebourne Valley SMI, and a moderate adverse residual effect on Ingrebourne River (within the DCO boundary). Construction and operation of the Scheme will affect Priority Habitats and Priority Species.
- 4.5.4 However, with the incorporation of appropriate mitigation and/or compensation measures as set out within the REAC (application document TR010029/APP/7.3), a residual neutral effect can be applied for all these resources.

#### Water environment

- 4.5.5 The Scheme would result in a combination of effects, some positive with the incorporation of naturalistic river realignments and some negative with a predicted short-term (6-24hrs) breach in water quality standards to the Ingrebourne River. This is not deemed significant. It is assumed flow attenuation such as the sediment catchpits and orifice flow controllers can lesson this impact on water quality by regulating the discharge, thereby improving the situation compared to not using this mitigation feature.

- 4.5.6 The WFD compliance assessment report (application document TR010029/APP/6.7) concluded the Scheme is compliant with the requirements of the WFD. None of the components that make up the Scheme are considered to cause deterioration at the water body scale and all should not prevent future attainment of good ecological status and good ecological potential. Mitigation works, outside of the DCO boundary, delivered by the EA as part of their programme of works within the Ingrebourne WFD water body are also committed to in order to address the net loss of riverine habitat that the Scheme would otherwise have given rise to.
- 4.5.7 The FRA (application document TR010029/APP/6.6) concludes that, based on current flood risk understanding and the incorporation of flood risk mitigation, the Scheme would be at an acceptable level of flood risk and would not increase flood risk elsewhere. This conclusion remains true, both at opening year and over the lifetime of the Scheme taking climate change into consideration.

#### Physical activity

- 4.5.8 Usage of NMU routes and PRoW in the area are generally low. The only affected route identified is to the existing shared use footpath to the northern side of the A12 off-slip. The existing footpath will be lost due to the need to realign the A12 off-slip of which it forms part. The replacement to be provided will be widened from between 1.6m and 2m to 2.6m in order to provide additional space for shared use which when operational, should result in beneficial effects. The construction works would ensure that the new footway to be constructed is made available for use prior to the closure of the existing footpath to minimise slight adverse effects during construction. All other routes would remain unaffected by the Scheme.

#### Journey quality

- 4.5.9 Amenity - the Scheme will improve the safety of the junction for all road users through reducing the levels of congestion experienced. The air quality levels at the junction are also expected to improve as a result of the reduction in congestion.
- 4.5.10 Views from the road - during the construction phase, the views from the road are expected to be temporarily worsened given the nature of the construction works. At opening year stage, the views are also expected to be worse than currently experienced given that the proposed mitigation planting will require time to grow and establish. In future years, the views from the road are anticipated to return to current levels of quality given the level of mitigation planting and due to the height of the loop road relative to the existing junction.
- 4.5.11 Driver stress - while it is expected that the levels of driver stress may be temporarily adversely affected during the construction phase, this would be mitigated through traffic management. At operational stage, the level of driver stress is expected to improve as a result of a reduction in the level of congestion and a reduction in delays experienced at the junction.

#### Security

- 4.5.12 The Scheme is unlikely to have an effect on security.

#### Accessibility



4.5.13 The Scheme is unlikely to have a substantial effect on access to services.

Affordability

4.5.14 The Scheme is not expected to lead to extra charges to users (parking charges, public transport fare changes, etc). The Scheme will increase capacity and reduce congestion, which will lead to net reductions in car fuel and non-fuel operating costs.

Severance

4.5.15 The Scheme would require a slight change to the access point to Grove Farm as a new A12 off-slip would be created. However, the current access would be maintained and / or temporary access provided during the construction stage until the new access is available for use. The Scheme is therefore considered to have a neutral impact on severance to Grove Farm. Access to Maylands Cottages, dwellings at Harold Park, along Brook Street and in the wider area would not be affected by the Scheme and the impact in terms of severance is therefore considered to be neutral. Given the minimal impacts the Scheme will have on NMU routes, the impacts on severance to users of these routes is also considered to be neutral.

Option and non-Use values

4.5.16 The Scheme would not affect transport mode options in the study area.

Distributional impact: severance

4.5.17 There are some links with changes in traffic flow, either an increase or decrease of more than 10%. These changes are mainly localised to the motorway junction, and therefore are unlikely to cause additional severance as flows are already high around the junction. There are no physical changes to the pedestrian environment as a result of the Scheme.

4.5.18 The Scheme does not sever any existing pedestrian or cyclist routes. Additionally, there are no residential areas adjacent to the Scheme and no vulnerable groups concentrated within the 1km buffer. This means that there will be no severance experienced in the area, and consequently no impact to severance.

4.5.19 Therefore, the overall assessment on severance is considered to be neutral.

Distributional impact: accidents

4.5.20 The assessment of accidents has been appraised as neutral for all vulnerable groups within the impact area. Although there is slightly higher prevalence of accidents than the national average for motorcyclists, under 16's and the 20% least deprived LSOAs, overall most links modelled within the accident impact area are forecasted to experience negligible changes in accidents. This also demonstrates that there are more links experiencing a decrease in accidents than are forecast to increase.

4.5.21 Due to the small changes in accident rate by link, which are mainly localised around the junction improvement, the overall assessment of the distributional impacts of accidents has been appraised as neutral.

#### Distributional impact: air quality

- 4.5.22 The overall assessment is concluded to be slight adverse given: (1) the large adverse NO<sub>2</sub> levels for income quintile 1 (most deprived), (2) the overall neutral impacts for all other quintiles for both NO<sub>2</sub> and PM<sub>10</sub> levels, and (3) given the lack of presence of specifically children within the 200m buffer.

#### Distributional impact: noise

- 4.5.23 As indicated in the noise modelling, all the receptors are forecasted to experience negligible impacts across all these quintiles. Furthermore, there are no schools within the noise assessment area so the overall impact on children is anticipated to be neutral.
- 4.5.24 Therefore, the overall impact of the Scheme to noise levels has been appraised as neutral.

#### Distributional impact: user benefits

- 4.5.25 The overall net change for time and cost impacts as a result of the Scheme is moderate beneficial for all income quintiles.
- 4.5.26 For all income quintiles, the proportion of benefits are in line with the proportion of the population, therefore, the overall impact on user benefits is moderate beneficial.

#### Distributional impact: affordability

- 4.5.27 The overall affordability impacts as a result of the Scheme are beneficial for all income quintiles. For income quintile 1, the proportion of benefits are in line with the proportion of the population, therefore the overall impact is moderate beneficial. The proportion of benefits are disproportionately greater than the proportion of the population for income quintiles 4 and 5 (least income deprived), therefore these are anticipated to be largely beneficial. For income quintiles 2 and 3 (most income deprived), benefits are disproportionately less than the proportion of the population. Therefore, these groups have a slightly beneficial impact.
- 4.5.28 These results lead to the overall assessment of affordability to be moderate beneficial.

## **4.6 Value for money**

- 4.6.1 The Level 1 PVB is estimated at £283.77m, and the PVC at £70.56m. This produces a NPV of £213.21m and a BCR of 4.02. This BCR represents medium value for money.
- 4.6.2 Journey time reliability benefits (£0.01m) and wider economic impacts (£13.61m) give a Level 2 PVB of £297.39m. The PVC is unchanged at £70.56m. This gives an adjusted NPV of £226.83m and an adjusted BCR of 4.21.
- 4.6.3 Table 4.4 summarises these indicators.

**Table 4.4: BCR calculation**

	Initial BCR	Adjusted BCR
PVC (£m)	£70.56m	£70.56m
PVB (£m)	£283.77m	£297.39m
NPV (£m)	£213.21m	£226.83m
BCR	4.02	4.21

Source: ComMA report, Table 14.4. All values are £m in 2010 market prices discounted to 2010



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