

# A417 Missing Link

Technical Appraisal Report Appendices February 2018



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# highways england

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# Appendix A – Glossary

Abbreviation	Definition
AADT	Analysis of Annual Average Daily Traffic
AMBC	Analysis of Monetised Costs and Benefits
AOD	Above Ordinance Datum
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
AQS	Air Quality Standards
AST	Appraisal Summary Table
ATC	Automatic Traffic Count
BCF	Benefit to Cost Ratio
BCR	Benefit Cost Ratio
BGS	British Geological Survey
BMV	Best and Most Versatile
ССВ	Cotswolds Conservation Board
CDM	Construction (Design and Management)
СЕМР	Construction Environment Management Plan
COBALT	Cost and Benefits of Accidents – Light Touch
CO2e	Carbon dioxide equivalent
COSHH	Control of Substances Hazardous to Health Regulations 2002
CRF	Congestion Reference Flow
CRV	Conservation Road Verges
CRoW	Countryside and Rights of Way Act 2000
CSR	Client Scheme Requirements
D2AP	Dual 2 Lane All Purpose Carriageway
DBFO	Design, Build, Finance and Operate
DCO	Development Consent Order
DEFRA	Department for Environment Food and Rural Affairs
DfT	Department for Transport
DM	Do Minimum
DMRB	Design manual for Road and Bridges
DS	Do Something
EAST Plus system	Early Assessment and Sifting Tool Plus system



ECEuropean CommissionECIEarly Contractor InvolvementEECEuropean Economic CommunityEIAEnvironmental Impact AssessmentEPAEnvironment Protection AgencyEUEuropean UnionFRAFlood Risk AssessmentGCCGloucestershire County CouncilGEHGEH is a form of Chi-squared statistic that incorporates both relative and absolute errors and issued to compare modelled traffic data against observed data.GHGGreen House GasesGINGloucestershire Local Nature PartnershipGWTGloucestershire Local Nature PartnershipGWTGloucestershire Wildlife TrustHADDMSHighways Agency Geotechnical Data ManagementHDVHeavy duty vehicleIANInterim Advice NoteIDCInvestment Decision CommitteeJCSJoint Core StrategyKPIKey Performance IndicatorsKSIKilled or seriously injuredLEPLocal Enterprise PartnershipLNRLocal Wildlife SiteMCCMManual of Contract Documents for Highways WorksMMSJVMott MacDonald Sweco Joint VentureMMSJVMott MacDonald Sweco Joint VentureMDD directorateNetwork Delivery and Development directorateNDD directorateNetwork Delivery and Development directorate	Abbreviation	Definition
EECEuropean Economic CommunityEIAEnvironmental Impact AssessmentEPAEnvironment Protection AgencyEUEuropean UnionFRAFlood Risk AssessmentGCCGloucestershire County CouncilGEHGEH is a form of Chi-squared statistic that incorporates both relative and absolute errors and issued to compare modelled traffic data against observed data.GHGGreen House GasesGISGeographical Information SystemGLNPGloucestershire Local Nature PartnershipGWTGloucestershire Local Nature PartnershipGWTGloucestershire Wildlife TrustHADDMSHighways Agency Drainage Data Management SystemHAGDMSHighways Agency Geotechnical Data ManagementHDVHeavy duty vehicleIANInterim Advice NoteIDCInvestment Decision CommitteeJCSJoint Core StrategyKPIKey Performance IndicatorsKSIKilled or seriously injuredLEPLocal Enterprise PartnershipLNRLocal Nature ReservesLWSLocal Wildlife SiteMCCManual Classified Turning CountsMHCWManual of Contract Documents for Highways WorksMMSJVMott MacDonald Sweco Joint VentureMoLMonetisation of LandscapeNCANational Character AreaNDD directorateNetwork Delivery and Development directorateNERCNatural Environment and Rural Communities	EC	European Commission
EIA       Environmental Impact Assessment         EPA       Environment Protection Agency         EU       European Union         FRA       Flood Risk Assessment         GCC       Gloucestershire County Council         GEH       GEH is a form of Chi-squared statistic that incorporates both relative and absolute errors and issued to compare modelled traffic data against observed data.         GHG       Green House Gases         GIS       Geographical Information System         GLNP       Gloucestershire Local Nature Partnership         GWT       Gloucestershire Wildlife Trust         HADDMS       Highways Agency Geotechnical Data Management System         HAGDMS       Highways Agency Geotechnical Data Management         HDV       Heavy duty vehicle         IAN       Interim Advice Note         IDC       Investment Decision Committee         JCS       Joint Core Strategy         KPI       Key Performance Indicators         KSI       Killed or seriously injured         LEP       Local Enterprise Partnership         LNR       Local Nature Reserves         LWS       Local Wildlife Site         MCTC       Manual Of Contract Documents for Highways Works         MHSJV       Mott MacDonald Sweco Joint Venture	ECI	Early Contractor Involvement
EPAEnvironment Protection AgencyEUEuropean UnionFRAFlood Risk AssessmentGCCGloucestershire County CouncilGEHGEH is a form of Chi-squared statistic that incorporates both relative and absolute errors and issued to compare modelled traffic data against observed data.GHGGreen House GasesGISGeographical Information SystemGLNPGloucestershire Local Nature PartnershipGWTGloucestershire Wildlife TrustHADDMSHighways Agency Drainage Data Management SystemHAGDMSHighways Agency Geotechnical Data ManagementHDVHeavy duty vehicleIANInterim Advice NoteIDCInvestment Decision CommitteeJCSJoint Core StrategyKPIKey Performance IndicatorsKSIKilled or seriously injuredLEPLocal Enterprise PartnershipLNRLocal Wildlife SiteMCTCManual Classified Turning CountsMHCWManual of Contract Documents for Highways WorksMMSJVMott MacDonald Sweco Joint VentureMoLMonetisation of LandscapeNCANational Character AreaNDD directorateNetwork Delivery and Development directorateNERCNatural Environment and Rural Communities	EEC	European Economic Community
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NDD directorateNetwork Delivery and Development directorateNERCNatural Environment and Rural Communities	MoL	Monetisation of Landscape
NERC Natural Environment and Rural Communities	NCA	National Character Area
	NDD directorate	Network Delivery and Development directorate
N/A Not/Applicable	NERC	Natural Environment and Rural Communities
	N/A	Not/Applicable



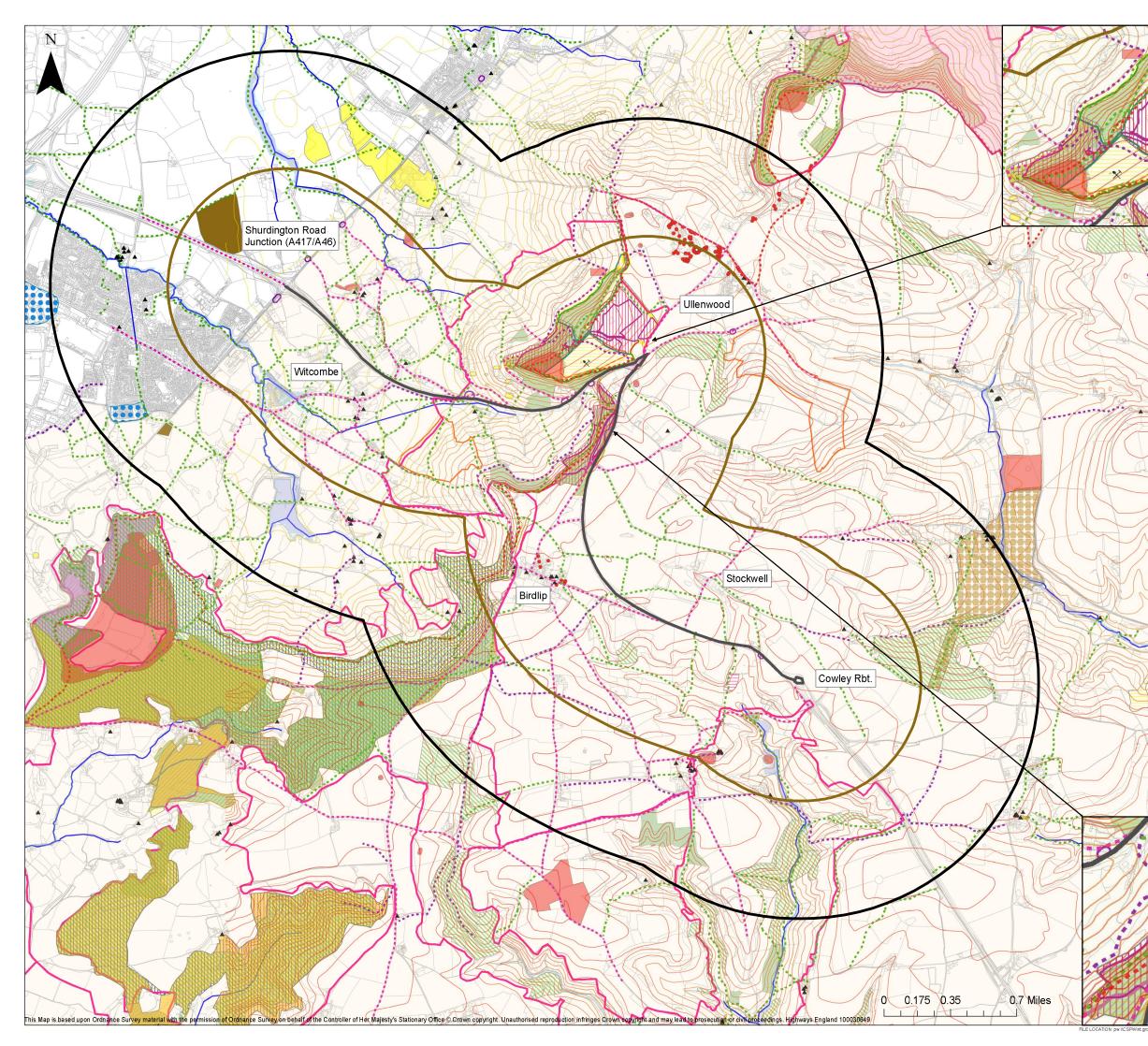
Abbreviation	Definition
NIA	Noise Important Areas
NMU	Non-motorised user(s)
NNNPS	National networks National Policy Statement
NO	Nitrogen Oxides
NO2	Nitrogen dioxide
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
NPSNN	National Policy Statement for National Networks
NPV	Net Present Value
NRSWA	New Roads and Street Works Act
NSIP	Nationally Significant Infrastructure Project
NTEM	National trip End Model
OD	Operations Directorate
OE	Option Estimate
OP	Off Peak
PCF	Project control framework
PCM	Pollution Climate Mapping
PIA	Personal Injury Accidents
PIC	Personal Injury Collisions
PM10	Particulate Matter
PRoW	Public Rights of Way
PSSR	Preliminary Sources Study Report
PVB	Present Value of Benefits
PVC	Present Value of Costs
QUADRO	Queues and Delays at Roadworks
RIGS	Regionally Important Geological Site
RoF	Region of Focus
RIP	Road Investment Programme
RIS	Road Investment Strategy
RIU	Regional Intelligence Indicators
RMS	Road Management Services
RPG	Registered Parks and Gardens

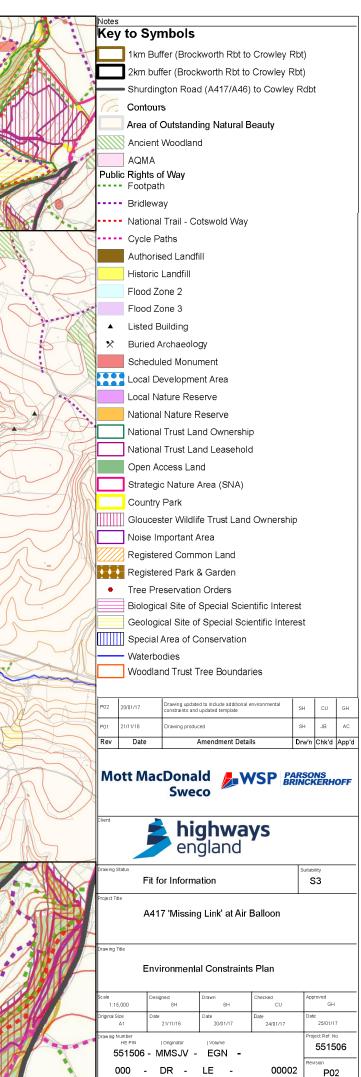


Abbreviation	Definition
RSPB	Royal Society for the Protection of Birds
RTF	Road Traffic Forecasts
RTM	Regional Transport Models
RTSR	Road Tunnel Safety Regulations
S2	Single lane Carriageway
SAC	Special Area of Conservation
SATURN	Simulation and Assignment of Traffic to Urban Road Networks
SEB	Statutory Environment Bodies
SEP	Strategic Economic Plan
SGAR	Stage Gate Assessment Review
SNA	Strategic Nature Area
SPOSH	Significant Possibility of Significant Harm
SPOSPCOW	Significant Possibility of Significant Pollution to Controlled Waters
SRN	Strategy Road Network
SSD	Stopping Sight Distance
SSSI	Site of Special Scientific Interest
SU2	Single Urban Carriageway
SWRTM	South West Regional Traffic Model
TAG	Transport Analysis Guidance
TAR	Technical Appraisal Report
ТВМ	Tunnel Boring Machine
TEMPRO	Trip End Model Presentation Program
ТРО	Tree Preservation Order
TUBA	Transport Users Benefit Appraisal software
VOC	Vehicle operating costs
VfM	Value for Money
VMS	Variable Message Signs
WebTAG	Transport Analysis Guidance
WFD	Water Framework Directive
WITA	Wider Impact in Transport Appraisal
WS2	Wide Single lane Carriageway



# Appendix B – Environmental constraints plan





SPWint grontmij net PW\_UK Production/Documents/Projects/Transportation/HES51506 - A417 Missing Link at Ar Balloon/Environment/General/Drgs & Models - 2D draw



# **Appendix C – Appraisal summary tables**

Appra	aisal Summary Table - Op	tion 3	Date produced: 10 01 2018		Co	ontact:
D	Name of scheme: lescription of scheme:	A417 Missing Link at Air Balloon The A417/A419 provides an important link between the Midlands and the South of Er M5/M4 route via Bristol. Its performance is hindered by the capacity limitations on the roundabouts restricting traffic flow between Brockworth bypass and Cowley roundabc December 2014, proposals were announced to develop a free flowing dual carriagew taking account of both the environmental sensitivity of the site and the importance of produced during PCF Stage 1 to provide decision makers with a concise, across-the economic, social, environmental and financial impacts of an intervention as set out in containing a 1km tunnel section south west of Crickley Hill where it aligns offline, joini	one single carriageway section of the A417 that has tw ut, as well as a priority junction with the B4070 on Birdl ay link between the Brockworth Bypass and the Cowle the route to the local economy. This AST has subseque board overview of the impacts of Option 3, taking acco the Treasury Green Book. Option 3 comprises a 4.7km	vo at-grade ip Bypass. In y Roundabout, ently been unt of all the	Name Organisation Role	Michael Goddard Highways England Promoter/Official
	Impacts	Summary of key impacts	Asses Quantitative	ssment Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.	Value of journey time changes(£m)         213.4           Net journey time changes (£m)         0 to 2min         2 to 5min         > 5min           -45.8         195.9         63.3	N/A	£248.4 million	N/A
	Reliability impact on Business users	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.	£21.3 million	Moderate Beneficial	£21.3 million	
	Regeneration Wider Impacts	The scheme is not in close proximity to a regeneration area. In the absence of a WITA analysis the simplified approach to estimating wider economic benefits set out in the DIT VfM guidance has been adopted. This recommends that an indicative measure of the value of increased output in imperfectly competitive markets can be estimated using a 10% uplift to Business User Benefits.	N/A £24.8 million	N/A N/A	N/A £24.8 million	
Environmental	Noise	Option 3 would provide a short tunnel, resulting in some noise reductions. The option would also pass through an area with a relatively low number of residential properties, resulting in a similar number of both noise increases and decreases at sensitive receptors. This option would not be effective at diverting traffic onto the new road and away from the existing alignment. A small number of properties with high noise levels and large noise changes are the result of the new road moving closer to those properties when compared to the baseline, and in some cases anomalies in OS addresspoint data. These will be addressed in the next iteration of the AST.	139 households experiencing increased daytime noise in forecast year 2039. 181 households experiencing reduced daytime noise in forecast year 2039. 184 households experiencing increased night time noise in forecast year 2039. 179 households experiencing reduced night time noise in forecast year 2039.	N/A	£0.9 million	N/A
	Air Quality	Overall there is a net worsening in local and regional air quality as a result of the scheme. This is because of the rerouting of vehicles on to the A417 and M5 away from the M40 and A34 which results in a longer route with a greater number of properties along it. There would be no new exceedances as a result. The Scheme is predicted to improve air quality at properties within the Birdlip AQMA and Oxford AQMA.	Local Air Quality Assessment Score in Year of Opening: 2024: NO2: +333.9 PM10: +54.1 Regional Emissions (Over 60 year appraisal period) NOx: +1,890 tonnes	N/A	PM10 NPV: -£0.2 million NOX NPV: -£1.0 million Total value of change in air quality:	N/A
	Greenhouse gases	There is an overall increase in greenhouse gases as a result of the scheme. The reason for the increase is because of an increase in road traffic with the scheme in place. This option would result in a notable increase in vehicle kilometres travelled which would result in an increase in emissions. Relatively low average speeds and low proportions of HDVs using the new road would minimise this overall increase in emissions.	Change in non-traded carbon over 60y (CO2e)         543,673           Change in traded carbon over 60y (CO2e)         2366	N/A	-£1.2 million	
	Landscape	Features and elements typical of the locality include a mixture of arable and pasture, with the dramatic limestone scarp rising above adjacent lowlands. Located in the most part within National Character Area 107 Cotswolds, and entirely within the Cotswolds AONB, the area is designated for its high landscape value. Around 25% of the Scheme would run in tunnel, limiting the visual prominence of the Scheme in this specific area. However, the surface sections, particularly those offline, and the two new junctions at the scheme extents would have an adverse impact on landscape features. The overall significance of effect is considered to be Large Adverse due to the potential for the scheme to damage the high quality landscape of NCA107, diminishing its quality, decreasing tranquility, disrupting fine and valued views of the area and resulting in an adverse impact upon the scale and pattern	N/A	Large Adverse	N/A	
	Townscape	of the landscape. Given the highly rural nature of the route, the scheme would not pass through any developed settlements greater than individual farmsteads. No village settlements would be directly affected by the route. A townscape appraisal is not considered necessary for this option due to the lack of urban features. Instead, the landscape appraisal should be referenced with regard to this route option.	N/A	No Impact	N/A	
	Historic Environment	The west portal of Option 3 would cause a significant Moderate adverse impact upon the setting of Crickley Hill Camp Scheduled Monument. There is also a potential for adverse impacts upon the rural setting of surrounding listed buildings including the Grade II Harding's Barn and Grade II Hill Barn from the construction of the new road and tunnel portals. There would be Moderate adverse impacts upon archaeological remains during construction groundworks. This includes possible remains associated with Crickley Hill Camp Scheduled Monument. Where the Option is in tunnel this will remove the impact to setting and archaeology, however, the tunnel portals will have a significant adverse impact on the surrounding rural character. The overall significance of effect is considered to be Moderate	N/A	Moderate Adverse	N/A	
	Biodiversity	Adverse. Bats have been valued as 'High' in this assessment and an Intermediate Negative impact is possible, resulting in a Large Adverse effect. The assessment of 'High' value is based on the precautionary principal at this early stage of assessment, as the presence of Nationally Important bat populations cannot be ruled out until more detailed surveys have been undertaken. The proposals could damage or destroy roosts, remove commuting routes, and result in killing and injury of bats in relation to traffic. Intermediate Negative impacts are identified for 'Medium' valued barn owl and hedgerow habitats due to potential loss and fragmentation of habitats, resulting in Moderate Adverse effects. Standard mitigation has been included in the assessment of likely impacts. There are considerable opportunities for additional ecological enhancement measures along the scheme corridor, including the provision of a green bridge at the <i>k</i> if Balloon roundabout. These benefits have not been included in the assessment of likely the the uncertainty of these measures. The overall	N/A	Large Adverse	N/A	
	Water Environment	appraisal score is based on the most adverse category assessment. Potentially adverse effects on direct groundwater receptors (groundwater bodies) and indirect groundwater receptors (springs, streams, wetland and abstractions) during construction and operation. In accordance with the TAG Unit A3 guidance, a potential impact magnitude of Moderate Adverse on a water feature of Very High importance results in a Highly Significant potential impact. Highly Significant potential impacts on two or more water features results in a Very Large Adverse Impact assessment score. Therefore, in the absence of ground investigation baseline data, and detailed design and mitigation measures, the potential impact assessment score for groundwater receptors including the Burford Jurassic groundwater body and Severn Vale - Jurassic Limestone Cotswolds Edge South groundwater body (both Great and Inferior Oolite) would be Very Large Adverse. The potential impact assessment score for surface water receptors would be Sight Adverse, due to standard mitigation measures implemented through the CEMP.	N/A	Very Large Adverse	N/A	
Social	Commuting and Other users	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.	Value of journey time changes(£m)         162.6           Net journey time changes (£m)         0 to 2min         2 to 5min           -43.9         154.4         52.1	N/A	£91.7 million	N/A
	Reliability impact on Commuting and Other users	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.	£16.3 million	Moderate Beneficial	£16.3 million	
	Physical activity	This option has the potential to result in the realignment of some Non-motorised User (NMU) routes, including the Cotswold Way National Trail, leading to an increase in journey times and potentially discouraging people from using routes which may result in a disbenefit for NMUs. However, the provision of new routes such as dedicated crossings, additional cycle paths and footpaths and retainment of NMU routes where possible, would have the potential to increase the number of people choosing alternative modes of transport to vehicles, such as on foot or bicycle, resulting in an improvement in the levels of physical activity. On balance, there would be an overall Slight Beneficial effect on physical activity.	N/A	Slight Beneficial	N/A	
	Journey quality	Option 3 is anticipated to slightly improve traveller care for vehicle travellers through the provision of new signs and potentially new laybys, the locations of which would be identified at Stage 2. Traveller stress is predicted to moderately improve with this option for vehicle travellers; with a reduction in frustration due to better journey times and reliability, route uncertainty with good design and layout of new and existing signs and also in the fear of potential accidents through the delivery of new NMU facilities and safety related infrastructure. For NMUs, journey times and reliability are likely to alter with numerous NMU facilities likely to be directly affected, as well as barriers between people and traffic and traffic flows for roads alongside NMU facilities also likely to change. The potential provision of NMU facilities at appropriate locations would minimise effects on journey quality for NMUs.	N/A	Moderate Beneficial	N/A	
	Accidents	A reduction in the number of personal injury accidents and casualties of putty quary for twice. A reduction in the number of personal injury accidents and casualties of all types results from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by increases in traffic (and accidents) in the A417 corridor although the net result is beneficial.	Reduction in PIAs: 29.9 Reduction in casualities Fatal: 1.5 Serious: 15.2 Slight: 36	N/A	£4.1 million	N/A
	Security Access to services	Effects on security as a result of this option are anticipated to be Neutral, as it is unlikely that there would be any changes to security indicators and therefore freedom from crime. This option is not anticipated to affect access to services within the vicinity of the option and	N/A	Neutral	N/A	N/A
	Affordability	This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral. The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local movements will experience increases in journey distance as a result of the scheme.	N/A N/A	Neutral Slight Beneficial	N/A N/A	N/A N/A
	Severance	There are no community facilities within 250m of this option however there is the potential for severance to occur to additional facilities further than 250m from the option. There is potential for severance to approximately five NMU routes, including footpaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making journeys to facilities. However, NMU facilities would be retained where possible and the provision of replacement and additional facilities used as crossings would reduce severance impacts to journeys. On balance, there would be an overall Neutral effect on severance.	N/A	Neutral	N/A	N/A
Public scount	Option and non-use values Cost to Broad Transport	The scheme does not include measures that will substantially change the availability of transport services in the study area.	N/A	Neutral	N/A	
. <u> </u>	Cost to Broad Transport Budget Indirect Tax Revenues	The scheme will be funded through Central Government Funds	Central Govt funding: £533.1 million	N/A	£533.1 million	

Appra	iisal Summary Table - Opt	ion 12	Date produced: 10 01 2018	3	C	ontact:				
	Name of scheme: escription of scheme:	A417 Missing Link at Air Balloon The A417/A419 provides an important link between the Midlands and the South of Engla		tive to the	Name Organisation	Michael Goddard Highways England				
	-grade /pass. In	Role	<u> </u>							
		December 2014, proposals were announced to develop a free flowing dual carriageway it account of both the environmental sensitivity of the site and the importance of the route t PCF Stage 1 to provide decision makers with a concise, across-the-board overview of th	o the local economy. This AST has subsequently been	produced during		Promoter/Official				
		environmental and financial impacts of an intervention as set out in the Treasury Green Book. Option 12 comprises a 6.4km surface route following the existing A417 up to Grove Farm where it diverts south east of the Air Balloon through a 270m right hand bend before joining the existing A417 alignment west of the B4070 junction for 1km. The route then diverts offline to the west of Stockwell Farm before joining the existing A417 just to the south of Cowley Roundabout.								
		apacts Summary of key impacts Assessment								
	Impacts	Summary of key impacts	Asse Quantitative	ssment Qualitative	Monetary	Distributional				
	Business users & transport		Value of journey time changes (Cm)		£(NPV)	7-pt scale/ vulnerable grp				
Economy	providers	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are	Value of journey time changes(£m)         141.5           Net journey time changes (£m)         0 to 2min         2 to 5min         > 5min	N/A	£108.3 million	N/A				
ĔĊ		the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.	-21.8 146.8 16.5							
	Reliability impact on Business users	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result	£14.2 million	Moderate Beneficial	£14.2 million					
	Regeneration	of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits. The scheme is not in close proximity to a regeneration area.	N/A	N/A	N/A					
	Wider Impacts	In the absence of a WITA analysis the simplified approach to estimating wider economic benefits set out in the DIT VIM guidance has been adopted. This recommends that an indicative measure of the	£10.8 million	N/A	£10.8 million					
		value of increased output in imperfectly competitive markets can be estimated using a 10% uplift to Business User Benefits.	210.6 million	N/A	£10.8 million					
Environmental	Noise	Option 12 is a surface route, and as such there would be not be any noise reductions achievable with a tunnel. However, this option would be reasonably effective at diverting traffic onto the new road and away from the existing alignment and would pass through an area with a relatively low number of residential properties, resulting in greater number of noise decreases than increases at sensitive receptors.	105 households experiencing increased daytime noise in forecast year 2039. 123 households experiencing reduced daytime noise in forecast year 2039. 41 households experiencing increased night time noise in forecast year 2039. 176 households experiencing reduced night time noise in forecast year 2039.	N/A	£1.1 million	N/A				
	Air Quality	Overall there is a net worsening in local and regional air quality as a result of the scheme. This is			PM10 NPV:					
		because of the rerouting of vehicles on to the A417 and M5 away from the M40 and A34 which results in a longer route with a greater number of properties along it.	Local Air Quality Assessment Score in Year of Opening: 2024: NO2: +305		-£0.3 million					
		There would be no new exceedances as a result. The Scheme is predicted to improve air quality at properties within the Birdlip AQMA and Oxford AQMA.	PM10: +76.2 Regional Emissions (Over 60 year appraisal period) NOx:	N/A	-£0.9 million Total value of	N/A				
		For the purpose of this assessment, it was assumed that one property would be demolished for the scheme ("Woodside House" on Crickley Hill).	+1,734 tonnes		change in air quality:					
	Greenhouse gases	There is an overall increase in greenhouse gases as a result of the scheme. The reason for the	Change in non-traded carbon over 60y (CO2e) 696,926	ð	- £1.2 million					
		increase is because of an increase in road traffic with the scheme in place. This option would result in a small increase in vehicle kilometres travelled which would minimise emission increases. However, an increase in average speeds, and also a high proportion of HDVs using the new road would result in	Change in traded carbon over 60y (CO2e) 1909	N/A	-£31.0 million					
	Landscape	an increase in emissions.		J						
		Features and elements typical of the locality include a mixture of arable and pasture, with the dramatic limestone scarp rising above adjacent lowlands. Located in the most part within National Character								
		Area 107 Coswolds, and entirely within the Coswolds ANNB, the area is derivative in the back Area 107 Coswolds, and entirely within the Coswolds ANNB, the area is derivative it is high landscape value. This option runs entirely at surface. The western half of the Scheme runs online and adjacent with the existing 4417, but when offline, runs along the side of the scarp slope before								
		crossing a rural scene over rising ground, traversing the Gloucestershire Way to the south of the Air Balloon junction and through countryside again at its most southerly extents. The new route would	N/A	Large Adverse	N/A					
		increase the level of disturbance in the area as it climbs up through the hiliside to the east, opening views of the route as it traverses the escarpment, and again as it traverses contours north of Nettleton. The overall significance of effect is considered to be Large Adverse due to the potential for Nettleton.								
		the scheme to damage the high quality landscape of NCA107, diminishing its quality, decreasing tranquility, disrupting line and valued views of the area and resulting in an adverse impact upon the scale and pattern of the landscape.								
	Townscape									
		Given the highly rural nature of the route, the scheme would not pass through any developed settlements greater than individual farmsteads. No village settlements would be directly affected by the route. A townscape appriasal is not considered necessary for this option due to the lack of urban	N/A	No Impact	N/A					
	Historic Environment	features. Instead, the landscape appraisal should be referenced with regard to this route option.								
	HISTORIC Environment	The Option 12 road corridor has the potential to cause a Moderate adverse impact upon the setting								
		of Crickley Hill Camp Scheduled Monument and a Large Adverse impact on Emma's Grove Scheduled Monument where the road would sever the landscape, and vehicle movement and road lighting cause noise, light and air pollution. There would also be adverse impacts upon the setting of								
		rural listed buildings located east of the proposed route including the Grade II Harding's Barn and Grade II Shab Hill Barn. There would be Moderate adverse impacts for this surface route option upon archaeological remains during construction groundworks. This would include archaeological remains	N/A	Large Adverse	€ N/A					
		potentially associated with Crickley Hill Camp Scheduled Monument and Emma's Grove Scheduled Monument. Following the precautionary principle, the overall significance of effect is considered to be Large Adverse.								
	Pladisoraitu	Laiya Auraisa.								
	Biodiversity	Bats have been valued as 'High' in this assessment and an Intermediate Negative impact is possible,								
		resulting in a Large Adverse effect. The assessment of 'High' value is based on the precautionary principal, as the presence of Nationally Important bat populations cannot be ruled out until more detailed surveys have been undertaken. The proposals could damage or destroy rootsr, remove			dverse N/A					
		commuting routes, and result in killing and injury of bats. Large Adverse effects are identified for Bushley Muzzard SSSI due to potential groundwater impacts as the option may intersect the aquifer	N/A	Large Adverse						
		that is supplying the SSSI. Intermediate Negative impacts are identified for 'Medium' valued barn owl and hedgerow habitats due to potential loss and fragmentation of habitats, resulting in Moderate Adverse effects. Standard mitigation has been included in the assessment of likely impacts. There are an effect as the standard mitigation has been included in the assessment of likely impacts. There are an effect as the standard mitigation has been included in the assessment of likely impacts. There are an effect as the standard mitigation has been included in the assessment of likely impacts. There are an effect as the standard mitigation has been included in the assessment of likely impacts. There are the standard mitigation has been included in the assessment of likely impacts. There are an effect as the standard mitigation has been included in the assessment of likely impacts. There are an effect as the standard mitigation has been included in the assessment of likely impacts. There are assessment as the standard mitigation has been included in the assessment of likely impacts. There are assessment as the standard mitigation has been included in the assessment of likely impacts. There are assessment as the standard mitigation has been included in the assessment of likely impacts. There are assessment as the standard mitigation has a standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by the standard by	IN/A	Large Adverse	N/A					
		considerable opportunities for additional ecological enhancement measures along the scheme corridor, including the provision of a green bridge at the Air Balloon roundabout. These benefits have not been included in the assessment of impacts due to the uncertainty of these measures. The overall								
		appraisal score is based on the most adverse category assessment.								
	Water Environment									
		Potentially adverse effects on direct groundwater receptors (groundwater bodies) and indirect groundwater receptors (springs, streams, wetland and abstractions) during construction and operation. A mainline cutting and embankment foundations/piles would intersect the Great Oolite								
		aquifer upgradient of Bushley Muzzard SSSI, potentially leading to a reduction in water supply to this spring-fed wetland and associated habitat loss. The mainline cutting close to Air Balloon would potentially divert groundwater from one catchment to another. In accordance with the TAG Unit A3								
		guidance, a potential impact magnitude of Moderate Adverse on a water feature of Very High importance results in a Highly Significant potential impact. Highly Significant potential impacts on two or more water features results in a Very Large Adverse Impact assessment score. Therefore, in the	N/A	Very Large Adverse	N/A					
		absence of ground investigation baseline data, and detailed design and mitigation measures, the potential impact assessment score for groundwater receptors including the Burford Jurassic								
		groundwater body and Severn Vale - Jurassic Limestone Cotswolds Edge South groundwater body (both Great and Inferior Oolite) would be Very Large Adverse. The potential impact assessment score for surface water receptors would be Slight Adverse, due to standard mitigation measures								
		implemented through the CEMP.								
Social	Commuting and Other users	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are	Value of journey time changes(£m)         111.5           Net journey time changes (£m)         0 to 2min         2 to 5min         > 5min	N/A	£33.8 million					
		the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.	0 to 2min         2 to 5min         > 5min           -18.9         118.6         12							
	Reliability impact on Commuting and Other users	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme Monsties thenefits have been estimated as a 10% unit for travel time benefits	£11.2 million	Moderate Beneficial	£11.2 million					
	Physical activity	of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits. This option has the potential to result in the realignment of some Non-motorised User (NMU) routes,								
		This option has the potential of result if the readjinent of some work-introduced user (wwo) (outes, including the Cotswold Way National Trail, leading to an increase in journey times and potentially discouraging people from using routes which may result in a disbenefit for NMUs. However, the provision of new routes such as dedicated crossings, additional cycle paths and footpaths and								
		retainment of NMU routes where possible, would have the potential to increase the number of people choosing alternative modes of transport to vehicles, such as on foot or bicycle, resulting in an	N/A	Slight Beneficial	N/A					
		improvement in the levels of physical activity. On balance, there would be an overall Slight Beneficial effect on physical activity.								
	Journey quality	Option 12 is anticipated to slightly improve traveller care for vehicle travellers through the provision of new signs and potentially new laybys, the locations of which would be identified at Stage 2. The								
		implementation of an appropriate landscape design would restrict views to the wider area for motorists. Traveller stress is predicted to slightly improve with this option in place for vehicle travellers;								
		with a reduction in frustration due to better journey times and reliability, route uncertainty with good design and layout of new and existing signs and also in the fear of potential accidents through the delivery of new NNU facilities and safety related infrastructure. For NNUs, journey times and reliability	N/A	Slight Beneficial	N/A					
		are likely to alter with numerous NMU facilities likely to be directly affected, barriers between people and traffic and traffic flows for roads alongside NMU facilities are also likely to change. The potential provision of NMU facilities at appropriate locations would minimise effects on journey quality for								
	Accidents	NMUs.	Parallel and a state of the state							
		A reduction in the number of personal injury accidents and casuaties of all types results from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by	Reduction in PIAs: 16.8 Reduction in casualties Fatal: 1.4	N/A	£3.3 million	N/A				
	Security	increases in traffic (and accidents) in the A417 corridor although the net result is beneficial.	Serious: 10.9 Slight: 23.5							
	Access to services	Effects on security as a result of this option are anticipated to be Neutral, as it is unlikely that there would be any changes to security indicators and therefore freedom from crime.	N/A	Neutral	N/A	N/A				
	Access to services	This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral.	N/A	Neutral	N/A	N/A				
	Severance	The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local movements will experience increases in journey distance as a result of the scheme.	N/A	Slight Beneficial	N/A	N/A				
		There are three community facilities within 250m of this option, although there is the potential for severance to occur to additional facilities further than 250m from the option. There is potential for approximately is NMU routes to be severed including footnatise and Najonal Traile which could lead								
		approximately six NMU routes to be severed, including footpaths and National Trails, which could lead to NMUs being dissuaded from making journeys to facilities and having to travel further. However, NMU facilities would be retained where possible and the provision of replacement and additional the severe	N/A	Neutral	N/A	N/A				
		facilities such as crossings would reduce severance impacts to journeys. On balance, there would be an overall Neutral effect on severance.								
<u>, 1</u>	Option and non-use values Cost to Broad Transport	The scheme does not include measures that will substantially change the availability of transport services in the study area.	N/A	Neutral	N/A					
Public	Cost to Broad Transport Budget Indirect Tax Revenues	The scheme will be funded through Central Government Funds	Central Govt funding: £276.6 million	N/A	£276.6 million					
		There would be some increase in the tax being paid to the Exchequer	Central Govt funding: Wider Public Finances = -£62.5 million	N/A	-£62.5 million					

Appraisal Summary Table - Option 21     Date produced:     10     01     2018       Name of scheme:     A417 Missing Link at Air Balloon						ontact:
D	Name of scheme: escription of scheme:	Name Organisation Role	Michael Goddard Highways England Promoter/Official			
	Impacts	Summary of key impacts	Asses Quantitative	sment Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.	Value of journey time changes(£m)         220.1           Net journey time changes (£m)         0 to 2min         2 to 5min         > 5min           -58.6         198.7         80         -	N/A	£271.0 million	N/A
	Reliability impact on Business users Regeneration	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.	£22.0 million	Moderate Beneficial	£22.0 million	
	Wider Impacts	The scheme is not in close proximity to a regeneration area. In the absence of a WITA analysis the simplified approach to estimating wider economic benefits set out in the DIT VfM guidance has been adopted. This recommends that an indicative measure of the value of increased output in imperfectly competitive markets can be estimated using a 10% uplift to Business User Benefits.	N/A £27.1 million	N/A N/A	N/A £27.1 million	
Environmenta	Noise	Option 21 would provide a long tunnel, resulting in noise reductions. This option would be effective at diverting traffic onto the new road and away from the existing alignment and would pass through an area with a relatively low number of residential properties, resulting in a greater number of decreases in noise than increases at sensitive receptors.	64 households experiencing increased daytime noise in forecast year 2039. 202 households experiencing reduced daytime noise in forecast year 2039. 12 households experiencing increased night time noise in forecast year 2039. 180 households experiencing reduced night time noise in forecast year 2039.	N/A	£2.0 million	N/A
	Air Quality	Overall there is a net worsening in local and regional air quality as a result of the scheme. This is because of the rerouting of vehicles on to the A417 and M5 away from the M40 and A34 which results in a longer route with a greater number of properties along it. There would be no new exceedances as a result. The Scheme is predicted to improve air quality at properties within the Birdlip AQMA and Oxford AQMA.	Local Air Quality Assessment Score in Year of Opening: 2024: NO2: +239.78 PM10: +92.7 Regional Emissions (Over 60 year appraisal period) NOx: +1.120 tonnes	N/A	PM10 NPV: -£0.2 million NOX NPV: -£0.6 million Total value of change in air	N/A
	Greenhouse gases	There is an overall increase in greenhouse gases as a result of the scheme. The reason for the increase is because of an increase in road traffic with the scheme in place. This option would result in a considerable increase in vehicle kilometres travelled which would result in an increase in emissions. However, low average speeds and low proportions of HDVs using the new road would minimise overall increases in emissions.	Change in non-traded carbon over 60y (CO2e)         500,106           Change in traded carbon over 60y (CO2e)         2424	N/A	-£-22.2 million	
	Landscape	Features and elements typical of the locality include a mixture of arable and pasture, with the dramatic limestone scarp rising above adjacent lowlands. Located in the most part within National Character Area 107 Cotswolds, and entirely within the Cotswolds AONB, the area is designated for its high landscape value. Elevated views from the top of the escarpment have views westward over falling ground into the neighbouring vale. These elevated views may be altered where views capture the very westerly extent of the Scheme just prior to it entering the western tunnel portal. The majority of the Scheme would run in tunnel, limiting the visual prominence of the scheme, however two new junctions at the scheme extents would likely have an adverse impact on the surrounding landscape and visual receptors. The overall assessment score in light of the majority of the scheme being in tunnel is considered to be Moderate Adverse, as small sections at surface would still be at odds with the local pattern, and having a wider impact upon a landscape of recognised quality.	N/A	Moderate Adverse	N/A	
	Townscape	Given the highly rural nature of the route, the scheme would not pass through any developed settlements greater than individual farmsteads. No village settlements would be directly affected by the route. A townscape appraisal is not considered necessary for this option due to the lack of urban features. Instead, the landscape appraisal should be referenced with regard to this route option.	N/A	No Impact	N/A	
	Historic Environment	The Option 21 west portal would cause a Moderate adverse impact upon the setting of Crickley Hill Camp Scheduled Monument. The west portal would also adversely impact the setting of the Grade II listed Crickley Hill Farm. There is also a potential adverse impact upon the rural setting of the Grade II Harding's Barn and other listed buildings surrounding the east portal. Impacts to archaeological remains are reduced because Option 21 would largely be in tunnel, although where there are construction groundworks there is still a potential for Moderate adverse impacts upon unknown archaeological remains. The overall significance of effect is considered to be Moderate Adverse.	N/A	Moderate Adverse	N/A	
	Biodiversity	Minor Negative impacts are currently identified for designated sites which are valued as either 'Very High', 'High' or 'Medium'; for 'High' valued bats; and for 'Medium' valued broadleaved woodland, lowland calcareous grassland, hedgerows, standing water, watercourses, barn own, badger, dormouse, great crested newt, reptiles and terrestrial invertebrates, resulting in a Slight Adverse effect. The proposals could potentially directly result in loss and fragmentation of habitats. There are considerable opportunities for ecological enhancement measures along the scheme corridor and wider landscape, including providing habitat connectivity between isolated areas of ancient woodland and calcareous grassland, and the provision of a green bridge at the Air Balloon roundabout. These benefits have not been included in the assessment of impacts at this stage due to the uncertainty of there measures. Option 21 is currently appraised as potentially resulting in a Slight Adverse effect on Biodiversity based on the most adverse category assessment.	N/A	Slight Adverse	N/A	
	Water Environment	Potentially adverse effects on direct groundwater receptors (groundwater bodies) and indirect groundwater receptors (springs, streams, wetland and abstractions) during construction and operation. In accordance with the TAG Unit A3 guidance, a potential impact magnitude of Moderate Adverse on a water feature of Very High importance results in a Highly Significant potential impact. Highly Significant potential impacts on two or more water features results in a Very Large Adverse Impact assessment score. Therefore, in the absence of ground investigation baseline data, and detailed design and mitigation measures, the potential impact assessment score for groundwater receptors including the Burford Jurassic groundwater body and Severn Vale - Jurassic Limestone Cotswolds Edge South groundwater body (both Great and Inferior Oolite) would be Very Large Adverse. The potential impact assessment score for surface water receptors would be Slight Adverse, due to standard mitigation measures implemented through the CEMP.	N/A	Very Large Adverse	N/A	
Social	Commuting and Other users	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.	Value of journey time changes(Em)         165.8           Net journey time changes (Em)         0 to 2min         2 to 5min         > 5min           -54.3         156.0         64.1	N/A	£96.8 million	N/A
	Commuting and Other users	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.	£16.6 million	Moderate Beneficial	£16.6 million	
	Physical activity	This option has the potential to result in the realignment of some Non-motorised User (NMU) routes, including the Cotswold Way National Trail, leading to an increase in journey times and potentially discouraging people from using routes which may result in a disbenefit for NMUs. However, the provision of new routes such as dedicated crossings, additional cycle paths and footpaths and retainment of NMU routes where possible, would have the potential to increase the number of people choosing alternative modes of transport to vehicles, such as on foot or bicycle, resulting in an improvement in the levels of physical activity. On balance, there would be an overall Slight Beneficial effect on physical activity.	N/A	Slight Beneficial	N/A	
	Journey quality	Option 21 is anticipated to slightly improve traveller care for vehicle travellers through the provision of new signs and potentially new laybys, the locations of which would be identified at Stage 2. Traveller stress is predicted to moderately improve with this option for vehicle travellers; with a reduction in frustration due to better journey times and reliability, route uncertainty with good design and layout of new and existing signs and also in the fear of potential accidents through the delivery of new NMU tacilities and safety related infrastructure. For NMUs, journey times and reliability are likely to alter with numerous NMU facilities likely to be directly affected, barriers between people and traffic and traffic flows for roads alongside NMU facilities also likely to change. The potential provision of NMU facilities at appropriate locations would minimise effects on journey quality for NMUs.	N/A	Moderate Beneficial	N/A	
	Accidents	A reduction in the number of personal injury accidents and casualties of all types results from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by increases in traffic (and accidents) in the A417 corridor although the net result is beneficial.	Reduction in PIAs: 34.4 Reduction in casualties Fatal: 1.4 Serious: 16.3 Slight: 39.5	N/A	£4.2 million	N/A
	Security	Effects on security as a result of this option are anticipated to be Neutral, as it is unlikely that there would be any changes to security indicators and therefore freedom from crime.		Neutral	N/A	N/A
	Access to services Affordability	This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral. The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local	N/A N/A	Neutral Slight Beneficial	N/A N/A	N/A N/A
	Severance	movements will experience increases in journey distance as a result of the scheme. There is one community facility within 250m of this option and there is the potential for severance to occur to additional facilities further than 250m from the option. There is potential for severance to approximately 11 NMU routes including footpaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making journeys to facilities. However,	N/A	Neutral	N/A	N/A
		NMU facilities would be retained where possible and the provision of replacement and additional facilities such as crossings would reduce severance impacts to journeys. On balance, there would be an overall Neutral effect on severance.				
2 0	Option and non-use values Cost to Broad Transport Budget Indirect Tax Revenues	additional facilities such as crossings would reduce severance impacts to journeys. On	N/A	Neutral	N/A	

	Appraisal Summary Table - Opti	ion 24	Date produced: 10 01 2018		C	ontact:
Image: specified base in the specified base into the specified	Name of scheme: Description of scheme:	A417 Missing Link at Air Balloon The A417/A419 provides an important link between the Midlands and the South of Eng M5/M4 route via Bristol. Its performance is hindered by the capacity limitations on the c roundabouts restricting traffic flow between Brockworth bypass and Cowley roundabou December 2014, proposals were announced to develop a free flowing dual carriagewa taking account of both the environmental sensitivity of the site and the importance of th produced during PCF Stage 1 to provide decision makers with a concise, across-the-bo economic, social, environmental and financial impacts of an intervention as set out in th	and, between Gloucester and Swindon, and as an altern ne single carriageway section of the A417 that has two t, as well as a priority junction with the B4070 on Birdlip link between the Brockworth Bypass and the Cowley F e route to the local economy. This AST has subsequent bard overview of the impacts of Option 24, taking accou le Treasury Green Book. Option 24 comprises an offline	native to the at-grade Bypass. In coundabout, y been nt of all the	Name Organisation	Michael Goddard Highways England Promoter/Official
	Impacts	Summary of key impacts				Distributional 7-pt scale/ vulnerable grp
No.     Allower of the intervent of the interve	Business users & transport providers	A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes	Net journey time changes (£m)           0 to 2min         2 to 5min         > 5min	N/A	£238.0 million	N/A
	users	A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.		Beneficial		
Note:       Note: <t< td=""><td>Wider Impacts</td><td>In the absence of a WITA analysis the simplified approach to estimating wider economic benefits set out in the DIT VIM guidance has been adopted. This recommends that an indicative measure of the value of increased output in imperfectly competitive markets can be</td><td></td><td></td><td></td><td></td></t<>	Wider Impacts	In the absence of a WITA analysis the simplified approach to estimating wider economic benefits set out in the DIT VIM guidance has been adopted. This recommends that an indicative measure of the value of increased output in imperfectly competitive markets can be				
		effective at diverting traffic onto the new road and away from the existing alignment but would pass through an area with a relatively high number of residential properties, resulting in a similar number of noise increases and decreases at sensitive receptors. A small number of properties with high noise levels and large noise changes are the result of the new road moving closer to those properties when compared to the baseline, and in some cases anomalies in OS	forecast year 2039. 243 households experiencing reduced daytime noise in forecast year 2039. 270 households experiencing increased night time noise in forecast year 2039. 253 households experiencing reduced night time	N/A	£0.7 million	N/A
		is because of the rerouting of vehicles on to the A417 and M5 away from the M40 and A34 which results in a longer route with a greater number of properties along it. There would be no new exceedances as a result. The Scheme is predicted to improve air quality at properties within the Birdlip AQMA and Oxford AQMA. For the purpose of this assessment, it was assumed that one property would be demolished for	2024: NQ2: +148.4 PMI0: +18.7 Regional Emissions (Over 60 year appraisal period) NOx: +1,878 tonnes	N/A	-£0.1 million NOX NPV: -£1.0 million Total value of change in air quality:	N/A
	Greennouse gases	increase is because of an increase in road traffic with the scheme in place. This option would result in an increase in vehicle kilometres travelled which would minimise emission increases. Average speeds would also be relatively low, although HDV proportions would be relatively		N/A	-£33.2 million	
		dramatic limestone scarp rising above adjacent lowlands. Located in the most part within National Character Area 107 Cotswolds, and entirely within the Cotswolds AONB, the area is designated for its high landscape value. Elevated views from the top of the escarpment have views westward over falling ground into the neighbouring vale, and would likely be affected by the presence of the Scheme as it sweeps from the A17 southwards before entering the western tunnel portal south west of Birdlip Hill. Around one third of the Scheme would run in tunnel, however the majority of the route would run offline through an unspoilt rural landscape, traversing local field boundaries and running perpendicular to the contour profile of the escarpment as it climbs eastwards, damaging the integrity of the scarp slope. As such the overall effect is considered to be Large Adverse as the scheme would also be visually intrusive and disrupt fine and valued views in the area as well as being at considerable wariance with	N/A	Large Adverse	N/A	
Notice		environment. The closest it comes to a built environment of more than one or two properties is where the scheme would run approximately 100m (at its closest point) to the small hamlet of Little Witcombe. It is not considered that this qualifies as an urban environment and there would be no direct impact upon the hamlet itself. As such it is considered that the landscape appraisal	N/A	No Impact	N/A	
Image: Second secon	Historic Environment	several high value listed buildings in Little Witcombe, Great Witcombe and Brimpsfield, including the Grade I Listed Church of St Michael, the Grade I Listed Church of St Mary and the Grade II <sup>I</sup> Listed Beach Hall. There would also be potential Moderate adverse setting impacts upon Brimpsfield Castle and Mound Scheduled Monuments and Slight adverse Brimpsfield Conservation Area and surrounding grade II listed buildings to the east of the tunnel. Where there are construction groundworks there is a potential for Moderate adverse impacts upon unknown archaeological remains. Where the Option is in tunnel this will remove the impact to setting and achaeology, however, the tunnel portals will have a significant adverse impact on the surrounding rural character. The overall significance of effect is considered to be Moderate	NA		N/A	
Producting and other set of the State	Biodiversity	Cotswolds Beechwoods SAC/SSSI due to the proximity of the western portal to the edge of the designated site and potential effects associated with air quality impacting on habitats and hydrological impacts associated with tunnelling, resulting in a Large Adverse effect. Intermediate Negative impacts are identified for the 'High' valued Bushley Muzzard SSSI with potential for significant impacts to hydrology affecting the wetland habitats within this SSSI. Bats have been valued as 'High' in this assessment and an Intermediate Negative impact is possible, resulting in a Large Adverse effect. The presence of Nationally Important bat populations cannot be ruled out at this stage until more detailed surveys have been undertaken. The proposals could damage or destroy roosts, remove commuting routes, and result in killing and injury of bats. Standard mitigation has been included in the assessment of likely impacts. There are considerable opportunities for ecological enhancement measures along the scheme corridor, including the provision of a green bridge at the Air Bailoon roundabout. These benefits have not been included in the assessment of likely to the uncertainty of these measures.	N/A	Large Adverse	N/A	
Bit         Description         Moderate Network         Moderate Network         Moderate Network         Moderate Network         Moderate Network         N/A         E71.8 million         N/A           Reliability impact on Commuting and Other uses         Reliability impact and charges         Reliability impact and charges         Reliability impact and charges         N/A         E71.8 million         N/A         E71.8 million           Physical act/NIV         Reliability impact and seases         Reliability impact and sease         Reliability impact and seases         Reliability impact and sease         Reliability impact and seases         Reliability impact and seases         Reliability impact and seases <td>Water Environment</td> <td>groundwater receptors (springs, streams, wetland and abstractions) during construction and operation. A mainline cutting intersects the full thickness of the Great Oolite aquifer upgradient of Bushley Muzzard SSSI, potentially leading to loss of water supply to this spring-fed wetland. An access road and junction also crosses the SSSI. One or both are likely to result in substantial habitat loss. In accordance with the TAG Unit A3 guidance, a potential impact magnitude of Moderate Adverse on a water feature of Very High importance results in a Highly Significant potential impact. Highly Significant potential impacts on two or more water features results in a Very Large Adverse Impact assessment score. Therefore, in the absence of ground investigation baseline data, and detailed design and mitigation measures, the potential impact and Severn Vale - Jurassic Limestone Cotswolds Edge South groundwater body and Severn Vale - Jurassic Limestone Cotswolds Edge South groundwater body (bth Great and Inferior Colite) and also Bushley Muzzard Brimpsfield SSI would be Viery Large Adverse.</td> <td>N/A</td> <td></td> <td>N/A</td> <td></td>	Water Environment	groundwater receptors (springs, streams, wetland and abstractions) during construction and operation. A mainline cutting intersects the full thickness of the Great Oolite aquifer upgradient of Bushley Muzzard SSSI, potentially leading to loss of water supply to this spring-fed wetland. An access road and junction also crosses the SSSI. One or both are likely to result in substantial habitat loss. In accordance with the TAG Unit A3 guidance, a potential impact magnitude of Moderate Adverse on a water feature of Very High importance results in a Highly Significant potential impact. Highly Significant potential impacts on two or more water features results in a Very Large Adverse Impact assessment score. Therefore, in the absence of ground investigation baseline data, and detailed design and mitigation measures, the potential impact and Severn Vale - Jurassic Limestone Cotswolds Edge South groundwater body and Severn Vale - Jurassic Limestone Cotswolds Edge South groundwater body (bth Great and Inferior Colite) and also Bushley Muzzard Brimpsfield SSI would be Viery Large Adverse.	N/A		N/A	
NEW         Inducts benefits from journey time savings, which operating cost impacts and changes         -50.1         149.1         58.2           Reliability impact on Commuting and Other uses         Reliability benefits have been assessed using the stress based approach set out in TAG Unit.         Sec.1         149.1         58.2           Physical activity         This option fast the optimise bandias         Sec.101         149.1         58.2         Moderate Beneficial         £15.7 million         E15.7 million         E15.7 million         E15.7 million           Physical activity         This option fast the optimise that assessment has into increase in journey times and borghant and reliability of the extension of new routes such as declicated organity, additional cycle paths and the optimise of the optimise of the optimise transformed of the optimise and borghant and reliability on the provision of new routes such as declicated organity, additional cycle paths and reliability optimise and paths and the provision of new routes such as declicated organity, and reliability on the cycle, resulting in an improvement the levels of physical activity. To balance, there would be an overal Sight Beneficial Beneficial activity. To balance, there would be an overal Sight Beneficial activity. To balance, there would be an overal Sight Beneficial activity. To balance, there would be an overal Sight Beneficial activity. To balance, there would be an overal Sight Beneficial activity. To balance, there would be an overal Sight Beneficial activity. To balance, there would be an overal Sight Beneficial activity. To balance, there would be an overal Sight Beneficial activity. To balance, there would be an overeal Sight Beneficial activity. To balance, and reli	Commuting and Other users	A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary	Net journey time changes (£m)	N/A	£71.8 million	N/A
Accidents         Areadian benefits.         Reduction in PAs: 65.7           Provision         Or additional software provide and traffic and traffic forws of roads alongide         N/A         N/A           Accidents         A reduction in provement in the software provide and traffic and traffic forws of roads alongide         N/A         N/A           Security         Effects on security as a result of the software s		in user charges. Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial	-50.1 149.1 58.2		£15.7 million	
Journey quality         Option 24 is anticipated to slightly improve travellers care for vehicle travellers through the provision of new signs and potentially new laybys, the locations of which would be identified at Stage 2. Travellers sets is produced to moderately improve with this option in place for vehicle travellers; with a reduction in furstation due to better journey times and also in the fear of potential accidents through the delivery of new NMU facilities and safety Pelated infrastructure. For MULS, journey times and reliability, route likely to atter with mumerous NMU for containes likely to the with the visiting sing and also in the fear of potential accidents through the delivery of new NMU facilities and safety Pelated infrastructure. For MULS, journey times and reliability are likely to atter with numerous NMU for containes likely to the with numerous NMU for containes likely to atter with unsercus SMU for roads alongside NMU facilities are also likely to change. The potential provision of the A417 to a mode dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by increases in traffic (and accidents) in the A417 corridor atthough the net results from the evolute any changes to security indicators and therefore freedom from crite.         N/A         N/A         N/A           Security         Effects on security as a result of this option are anticipated to be Neutral, as it is unlikely that there would be any changes to security indicators and therefore freedom from crite.         N/A         N/A         N/A         N/A           Accidents         A reduction is not anticipated to affect access to services within the vicinity of the option and the feet or freedom from crite.         N/A         N/A         N/A         N/A         N	Physical activity	travel time benefits. This option has the potential to result in the realignment of some Non-motorised User (NMU) routes, including the Cotswold Way National Trail, leading to an increase in journey times and potentially discouraging people from using routes which may result in a disbenefit for NMUs. However, the provision of new routes such as dedicated crossings, additional cycle paths and footpaths and retainment of NMU routes where possible, would have the potential to increase the number of people choosing alternative modes of transport to vehicles, such as on foot or bicycle, resulting in an improvement in the levels of physical activity. On balance, there would	N/A		N/A	
Accidents       A reduction in the number of personal injury accidents and casualties of all types results from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by increases in traffic (and accidents) in the A417 corridor although the net result is beneficial.       Reduction in PIAs: 65.7 Reduction in casualties Serious: 21.7       Not applicable       £6.8 million       N/A         Security       Effects on security as a result of this option are anticipated to be Neutral, as it is unlikely that there would be any changes to security indicators and therefore freedom from crime.       N/A       Neutral       N/A       N/A         Access to services       This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral.       N/A       N/A       N/A       N/A         Affordability       The scheme should reduce highway journey times (and cost) for trunk road traffic. Some local movements will experience increases in journey distance as a result of the scheme.       N/A       Slight Beneficial       N/A       N/A         Severance       There are two community facilities within 250m of this option and there provison of replay. which could lead to NMUs being dissuaded from making joropaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making joropaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making joropaths, National fraitis and cycle paths, <b< td=""><td>Journey quality</td><td>Option 24 is anticipated to slightly improve traveller care for vehicle travellers through the provision of new signs and potentially new laybys, the locations of which would be identified at Stage 2. Traveller stress is predicted to moderately improve with this option in place for vehicle travellers; with a reduction in frustration due to better journey times and reliability, route uncertainty with good design and layout of new and existing signs and also in the fear of potential accidents through the delivery of new NMU facilities and safety related infrastructure. For NMUs, journey times and reliability are likely to alter with numerous NMU facilities is likely to be directly affected, barriers between people and traffic and traffic flows for roads alongside NMU facilities are also likely to change. The potential provision of NMU facilities are alsorpropriate</td><td>N/A</td><td></td><td>N/A</td><td></td></b<>	Journey quality	Option 24 is anticipated to slightly improve traveller care for vehicle travellers through the provision of new signs and potentially new laybys, the locations of which would be identified at Stage 2. Traveller stress is predicted to moderately improve with this option in place for vehicle travellers; with a reduction in frustration due to better journey times and reliability, route uncertainty with good design and layout of new and existing signs and also in the fear of potential accidents through the delivery of new NMU facilities and safety related infrastructure. For NMUs, journey times and reliability are likely to alter with numerous NMU facilities is likely to be directly affected, barriers between people and traffic and traffic flows for roads alongside NMU facilities are also likely to change. The potential provision of NMU facilities are alsorpropriate	N/A		N/A	
Energy of the resolutive as a resolution are anticipated to mis optimities and therefore freedom from crime.         N/A         Neutral         N/A         N/A           Access to services         This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral.         N/A         N/A<		A reduction in the number of personal injury accidents and casualities of all types results from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by increases in traffic (and accidents) in the A417 corridor although the net result is beneficial.	Reduction in casualties Fatal: 2.7 Serious: 21.7	Not applicable	£6.8 million	N/A
Affordability         The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local movements will experience increases in journey distance as a result of the scheme.         N/A         Neutral         N/A         N/A           Severance         There are two community facilities within 250m of this option and there is the potential for severance to approximately 11 NMU, including footpaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making journeys to facilities. However, NMU facilities within possible and the provision of regletations.         N/A         Neutral         N/A         N/A		there would be any changes to security indicators and therefore freedom from crime.				
Severance         There are two community facilities within 250m of this option and there is the potential for severance to acptroximately 11 NMU, including footpaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making journeys to facilities. However, NMU N/A         N/A         Neutral         N/A         N/A		effects on public transport accessibility would be Neutral. The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local				
would be an overall Neutral effect on severance.		There are two community facilities within 250m of this option and there is the potential for severance to occur to additional facilities further than 250m from the option. There is potential for severance to approximately 11 NMU, including footpaths, National Trails and cycle paths, which could lead to NNUs being dissuaded from making journeys to facilities. However, NMU facilities would be retained where possible and the provision of replacement and additional facilities such as crossings would reduce severance impacts to journeys. On balance, there would be an overall Neutral effect on severance.				N/A
Option and non-use values       The scheme does not include measures that will substantially change the availability of transport services in the study area.       N/A       Neutral       N/A         Set Cost to Broad Transport       Cost to Broad Transport       Central Govt funding: Wider Public Finances = £726.2       N/A       Set Cost to Broad Transport		transport services in the study area.				
Open Point       Cost to Broad Transport       The scheme will be funded through Central Government Funds       Central Govt funding: Wider Public Finances = £726.2 million       N/A       £726.2 million         Indirect Tax Revenues       There would be some increase in the tax being paid to the Exchequer       Central Govt funding: Wider Public Finances = ±64.9 million       N/A       -£64.9 million	Budget		million			

	isal Summary Table - Opt Name of scheme:	ion 29 A417 Missing Link at Air Balloon	Date produced:	10	01 2018		C Name	ontact: Michael Goddard
De	Name of scheme: escription of scheme:	The A417/A419 provides an important link between the Midlands and the South of Engl M5/M4 route via Bristol. Its performance is hindered by the capacity limitations on the c roundabouts restricting traffic flow between Brockworth bypass and Cowley roundabout December 2014, proposals were announced to develop a free flowing dual carriagewa taking account of both the environmental sensitivity of the site and the importance of th produced during PCF Stage 1 to provide decision makers with a concise, across-the-be economic, social, environmental and financial impacts of an intervention as set out in th	ne single carriag it, as well as a pri y link between the e route to the loca bard overview of the Treasury Gree	e single carriageway section of the A417 that has two at-grade as well as a priority junction with the B4070 on Birdlip Bypass. In link between the Brockworth Bypass and the Cowley Roundabout, route to the local economy. This AST has subsequently been ard overview of the impacts of Option 29, taking account of all the Treasury Green Book. Option 29 comprises an offline route of 5.7km				Promoter/Officia
	Impacts	in length, and containing a 1.7km tunnel north of Birdlip where it joins the existing A417 Summary of key impacts	at Cowley Round	dabout. Quantitative	Asses	ssment Qualitative	Monetary £(NPV)	Distribution 7-pt scale/
	Business users & transport providers	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.		urney time changes ourney time chang 2 to 5min 193.8		N/A	£248.4 million	vulnerable g
	Reliability impact on Business users	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.		£21.2 million		Moderate Beneficial	£21.2 million	
	Regeneration Wider Impacts	The scheme is not in close proximity to a regeneration area. In the absence of a WITA analysis the simplified approach to estimating wider economic benefits set out in the DIT VIM quidance has been adopted. This recommends that an		N/A		N/A	N/A	
	Noise	indicative measure of the value of increased output in imperfectly competitive markets can be estimated using a 10% uplift to Business User Benefits.		£24.8 million		N/A	£24.8 million	
		Option 29 would provide a tunnel, resulting in some noise reductions. This option would be effective at divering traffic onto the new road and away from the existing alignment but would pass through an area with a relatively high number of residential properties, resulting in a greater number of noise increases than decreases at sensitive receptors. A small number of properties with high noise levels and large noise changes are the result of the new road mowing closer to those properties when compared to the baseline, and in some cases anomalies in OS addresspoint data. These will be addressed in the next iteration of the AST.	forecast year 203 daytime noise experiencing ind	experiencing increase 39. 212 households ex in forecast year 2039 reased night time noi olds experiencing redu in forecast year 2039	periencing reduced 226 households se in forecast year ced night time noise	N/A	£0.6 million	N/A
	Air Quality	Overall there is a net worsening in local and regional air quality as a result of the scheme. This is because of the rerouting of vehicles on to the A417 and M5 away from the M40 and A34 which results in a longer route with a greater number of properties along it. There would be no new exceedances as a result. The Scheme is predicted to improve air quality at properties within the Birdlip AQMA and Oxford AQMA. For the purpose of this assessment, it was assumed that two properties would be demolished for the scheme ("The Cottage" on Green Lane and "Romanhurst Cottage" on Birdlip Hill).		y Assessment Score in 2024: NO2: +321.7 PM10: +34.1 pns (Over 60 year app +1,937 tonnes		N/A	PM10 NPV: -£0.1 million NOX NPV: -£1.0 million Total value of change in air quality:	N/A
	Greenhouse gases	There is an overall increase in greenhouse gases as a result of the scheme. The reason for the increase is because of an increase in road traffic with the scheme in place. This option would result in an increase in vehicle kilometres travelled which would minimise emission increases. Average speeds would be relatively high, although HDV proportions would be relatively low which would result in an overall increase in emissions.		ded carbon over 60y ( carbon over 60y (CO2	,,	N/A	- £1.1 million	
	Landscape	Features and elements typical of the locality include a mixture of arable and pasture, with the dramatic limestone scarp rising above adjacent lowlands. Located in the most part within National Character Area 107 Cotswolds, and entirely within the Cotswolds AONB, the area is designated for its high landscape value. Elevated views from the top of the escarpment have views westward over falling ground into the neighbouring vale and, would likely be affected by the presence of the Scheme as it sweeps from the A417 southwards before entering the western tunnel portal at Bridlip Hill. Around one third of the scheme would run in tunnel, however the remaining route would run offline as a new linear feature through an unspoilt landscape as it traverses the local landscape and contour profile of the escarpment as the route climbs eastwards, damaging the integrity of the scarp slope. Large scale junctions at either end of the scheme would also have a notable impact at considerable variance with the scale and pattern of the local landscape. Due to the likely disruption to valued views, and the degradation of key features within this landscape that can not be fully mitigated for, the overall significance of effect is Large Adverse.		N/A		Large Adverse	N/A	
	Townscape	Option 29 would pass through a rural landscape with no interaction with a townscape environment. The closest it comes to a built environment of more than one or two properties is where the scheme would run approximately 100m (at its closest point) to the small hamlet of Little Witcomb. It is not considered that this qualifies as an urban environment and there would be no direct impact upon the hamlet itself. As such it is considered that the landscape appraisal is a more appropriate appraisal method with regard to this route option.		N/A		No Impact	N/A	
	Historic Environment	The Option 29 road corridor has the potential to cause an overall Moderate adverse impact upon Listed Buildings. There would be an adverse impact on the setting of several high value listed buildings in Little Witcombe, Great Witcombe, including the Grade I Listed Church of St Mary and the Grade II <sup>I</sup> Listed Beach Hall. There would also be an adverse impact upon the setting of surrounding grade II listed buildings including the Golden Heart Inn and buildings located in Birdipi. There would be a Moderate adverse impact on Crickley Hill Camp Scheduled Monument and Brimpsfield Castle and Mound Scheduled Monuments. Where there are construction groundworks there is a potential Moderate adverse impact upon unknown archaeological remains. Where the Option is in tunnel this will remove the impact to setting and archaeology, however, the tunnel portals will have a significant adverse impact on the surrounding rural character. The overall significance of effect is considered to be Moderate		N/A		Moderate Adverse	N/A	
	Biodiversity	Adverse. Intermediate Negative impacts are currently identified for the 'Very High' and 'High' valued Cotswolds Beechwoods SAC/SSSI due to the proximity of the western portal to the edge of the designated site and potential effects associated with changes to air quality impacting on habitats. Additionally, the impact of tunnels on hydrology is currently unknown and this has potential to result in significant effects upon habitats. Bats have been valued as 'High' in this assessment and an Intermediate Negative impact is possible, resulting in a Large Adverse effect. The presence of Nationally important bat populations cannot be ruled out at this stage until more detailed surveys have been undertaken. The proposals could damage or destroy roosts, remove commuting routes, and result in killing and injury of bats. Intermediate Negative impacts are identified for 'Medium' valued barn owi and hedgerows. There are considerable opportunities for ecological enhancement measures along the scheme corridor, including the provision of a green bridge at the Air Balloon roundabout. These benefits have not been included in the assessment of impacts due to the uncentainty of these measures. The overall appraisal score is based on the most adverse category assessment.		N/A		Large Adverse	N/A	
	Water Environment	Potentially adverse effects on direct groundwater receptors (groundwater bodies) and indirect groundwater receptors (springs, streams, wetland and abstractions) during construction and operation of the scheme. In accordance with the TAG Unit A3 guidance, a potential impact magnitude of Moderate Adverse on a water feature of Very High importance results in a Highly Significant potential impact. Highly Significant potential impacts on two or more water features results in a Very Large Adverse Impact assessment score. Therefore, in the absence of ground investigation baseline data, and detailed design and mitigation measures, the potential impact assessment score for groundwater receptors including the Burford Jurassic groundwater body (bh Great and Sever Vale - Jurassic Limestone Cotwolds Edge South groundwater body (bh Great and Inferior Oolite) would be Very Large Adverse. The potential impact assessment score for surface water receptors would be Slight Adverse, due to standard mitigation measures implemented through the CEMP.		N/A		Very Large Adverse	N/A	
	Commuting and Other users	Journey time benefits arise from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user charges.		urney time changes burney time chang 2 to 5min 152.0		N/A	£89.5 million	N/A
	Reliability impact on Commuting and Other users	Reliability benefits have been assessed using the stress based approach set out in TAG Unit A1.3 Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.		£15.8 million		Moderate Beneficial	£15.8 million	
	Physical activity	This option has the potential to result in the realignment of some Non-motorised User (NMU) routes, including the Cotswold Way National Trail, leading to an increase in journey times and potentially discouraging people from using routes which may result in a disbenefit for NMUs. However, the provision of new routes such as dedicated crossings, additional cycle paths and footpaths and retainment of NMU routes where possible, would have the potential to increase the number of people choosing alternative modes of transport to vehicles, such as on foot or bicycle, resulting in an improvement in the levels of physical activity. On balance, there would be an overall Stight Beneficial effect on physical activity.		N/A		Slight Beneficial	N/A	
	Journey quality	Option 29 is anticipated to slightly improve traveller care for vehicle travellers through the provision of new signs and potentially new laybys, the locations of which would be identified at Stage 2. Traveller stress is predicted to moderately improve with this option for vehicle travellers; with a reduction in frustration due to better journey times and reliability, route uncertainty with good design and layout of new and existing signs and also in the fear of potential accidents through the delivery of new NMU facilities and safety related infrastructure. For NMUs, journey times and reliability are likely to alter with numerous NMU facilities at likely to be directly affected, barriers between people and raffic and traffic flows for roads alongside NMU facilities are also likely to change. The potential provision of NMU facilities at appropriate locations would minimise effects on journey qualify for NMUs.		N/A		Moderate Beneficial	N/A	
	Accidents	A reduction in the number of personal injury accidents and casualties of all types results from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by increases in traffic (and accidents) in the A417 corridor although the net result is beneficial.		Reduction in PIAs: 55 Reduction in casualti Fatal: 2.7 Serious: 20.4 Slight: 71.2		N/A	£6.2 million	N/A
	Security Access to services	Effects on security as a result of this option are anticipated to be Neutral, as it is unlikely that there would be any changes to security indicators and therefore freedom from crime. This calles is not anticipated to affect access to secure within the visibility of the apticate and		N/A		Neutral	N/A	N/A
	Access to services Affordability	This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral. The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local		N/A		Neutral	N/A	N/A
	Severance	movements will experience increases in journey distance as a result of the scheme. There are three community facilities within 250m of this option and there is the potential for severance to occur to additional facilities further than 250m from the option. There is potential for severance to approximately 12 NMU routes, including footpaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making journeys to facilities. However, NMU facilities would be retained where possible and the provision of replacement and		N/A N/A		Slight Beneficial	N/A N/A	N/A N/A
		additional facilities such as crossings would reduce severance impacts to journeys. On						
	Option and non-use values			N/A		Neutral	N/A	

Description of scheme:       The A417/A419 provides an important link between the Midlands and the South of England, between Gloucester and Swindon, and as an alternative to the M5/M4 route via Bristol. Its performance is hindred by the capacity limitations on the one single carriageway section of the A417 that has two at-grade M5/M4 route via Bristol. Its performance is hindred by the capacity limitations on the one single carriageway section of the A417 that has two at-grade modulo bus restricting traffic from between Brockworth bypass and Cowley roundabout, as well as a priority junction with the B4070 on Briding Bypass. In December 2014, proposals were announced to develop a free flowing dual carriageway link between the Brockworth Bypass and the Cowley Roundabout, taking account of both the environmental sensitivity of the site and the importance of the route to the local economy. This AST has subsequently been produced during PCF Stage 1 to provide decision makers with a concise, across-the-board overview of the impacts of Option 30, taking account of all the environmental and financial impacts of an intervention as set out in the Treasury Green Book. Option 30, comprises a 5.5km surface route following the existing A417 up to Grove Farm where it diverts south east of the Air Balloon through Shab Hill, where it joins the existing A417 at Cowley       Promoter/Official Promot	Appra	aisal Summary Table - Opti	on 30	Date produced:	10	0 01 2018		C	ontact:
Image: state in the state	C		The A417/A419 provides an important link between the Midlands and the South of Engli M5/M4 route via Bristol. Its performance is hindered by the capacity limitations on the or roundabouts restricting traffic flow between Brockworth bypass and Cowley roundabout, December 2014, proposals were announced to develop a free flowing dual carriageway taking account of both the environmental sensitivity of the site and the importance of the produced during PCF Stage 1 to provide decision makers with a concise, across-the-bo economic, social, environmental and financial impacts of an intervention as set out in th following the existing A417 up to Grove Farm where it diverts south east of the Air Balk	ne single carriagew as well as a priorit link between the B route to the local ard overview of the e Treasury Green B	ay section of the <i>i</i> ty junction with the rockworth Bypass economy. This AS impacts of Option Book. Option 30 c	A417 that has two a B4070 on Birdlip B and the Cowley Ro Thas subsequently n 30, taking account omprises a 5.5km si	t-grade ypass. In undabout, / been : of all the urface route	Organisation	Michael Goddard Highways England Promoter/Official
Max       Image: market set in the s		Impacts	Summary of key impacts		Quantitative	Asses			Distributional 7-pt scale/ vulnerable grp
NoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNoteNote </td <td>Economy</td> <td></td> <td>to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user</td> <td>Net jou 0 to 2min</td> <td>urney time chang 2 to 5min</td> <td>ges (£m) &gt; 5min</td> <td>N/A</td> <td>£170.9 million</td> <td>N/A</td>	Economy		to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user	Net jou 0 to 2min	urney time chang 2 to 5min	ges (£m) > 5min	N/A	£170.9 million	N/A
Note		users	Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a	<u> </u>			Beneficial	£18.5 million	
			In the absence of a WITA analysis the simplified approach to estimating wider economic benefits set out in the DIT VIM guidance has been adopted. This recommends that an indicative measure of the value of increased output in imperfectly competitive markets can be estimated using a 10% uplift to						
	Environmental	Noise	Option 30 is a surface route, and as such there would be not be any noise reductions achievable with a tunnel. However, this option would be reasonably effective at diverting traffic onto the new road and away from the existing alignment and would pass through an area with a relatively low number of residential properties, resulting in a greater number of noise decreases than increases at sensitive receptors. A small number of properties with high noise levels and large noise changes are the result of the new road moving closer to those properties when compared to the baseline, and in some	forecast year 203 daytime noise i experiencing increas	9. 167 households e: n forecast year 2039 sed night time noise experiencing reduced	xperiencing reduced 0. 116 households in forecast year 2039. d night time noise in	N/A	£0.8 million	N/A
		Air Quality	because of the rerouting of vehicles on to the A417 and M5 away from the M40 and A34 which results in a longer route with a greater number of properties along it. There would be no new exceedances as a result. The Scheme is predicted to improve air quality at properties within the Birdlip AQMA and Oxford AQMA. For the purpose of this assessment, it was assumed that one property would be demolished for the		NO2: +628.1 PM10: +99.2 ns (Over 60 year app		N/A	-£0.3 million NOX NPV: -£0.9 million Total value of change in air quality:	N/A
Image: Source of the second		Greenhouse gases	increase is because of an increase in road traffic with the scheme in place. This option would result in an increase in vehicle kilometres travelled which would minimise emission increases. Average speeds would be high, as would the proportion of HDVs using the new road which would result in an				N/A	-£30.6 million	
		Landscape	dramatic limestone scarp rising above adjacent lowlands. Located in the most part within National Character Area 107 Cotswolds, and entirely within the Cotswolds AONB, the area is designated for its high landscape value. Elevated views from the top of the escarpment have views westward over falling ground into the neighbouring vale, and views from Barrow Wake and the associated ridgeline would likely be affected by the presence of the Scheme as it runs close by to the A417 west of the Air Balloon jlunction. This option runs entirely at surface. The western hall of the Scheme runs online with the existing A417, but when offline, runs across a rural scene over rising ground. The new junction at Shab Hill would increase the level of disturbance of the area as it climbs up through the hillide to the east, opening views of the route as it traverses the escarpment. The overall significance of effect is considered to be Large Adverse due to the potential for the scheme to damage the high quality landscape of NCA107, diminishing its quality, decreasing tranquility, discupting fine and valued views		N/A		Large Adverse	N/A	
Note       Note       Ligs Actemp       Note         Part Pointering       Note       Note       Note       Note         Part Pointering       Note       Note       Note       Note       Note         Part Pointering       Note       Note       Note       Note       Note       Note         Part Pointering       Note       Note <td></td> <td>Townscape</td> <td>settlements greater than individual farmsteads. No village settlements would be directly affected by the route. A townscape appraisal is not considered necessary for this option due to the lack of urban</td> <td colspan="2">N/A</td> <td>No Impact</td> <td>N/A</td> <td></td>		Townscape	settlements greater than individual farmsteads. No village settlements would be directly affected by the route. A townscape appraisal is not considered necessary for this option due to the lack of urban	N/A		No Impact	N/A		
Bits beside in the book and at the the summarian of a for products in the length of part of the sum		Historic Environment	Hill Camp Scheduled Monument and Emma's Grove Scheduled Monument where the road severs the landscape and vehicle movement and road lighting cause noise, light and air pollution. There would also be adverse impacts upon the setting of rural listed buildings located east of the proposed surface route option including the Grade II Harding's Barn and Grade II Shab Hill Barn. There would be adverse impacts upon the action of the angle of the proposed archaeological remains potentially associated with Crickley Hill Camp Scheduled Monument and Emma's Grove Scheduled Monument. Following the precautionary principle, the overall significance		N/A		Large Adverse	N/A	
No.         No.         Variable device the first device device space-design registration models and indexe device space-design registration models and registratin model models and registration models and registration		Biodiversity	resulting in a Large Adverse effect. The assessment of 'High value is based on the precautionary principal, as the presence of Nationally Important bat populations cannot be ruled out until more detailed surveys have been undertaken. The proposals could potentially directly impact on populations of these species, reduce available habitat, result in habitat fragmentation and the mortality of bats in relation to traffic. Intermediate Negative impacts are identified for 'Medium' valued barn owl and hedgerow habitats due to potential loss and fragmentation of habitats. Standard mitigation has been included in the assessment of likely impacts. There are considerable opportunities for ecological enhancement measures along the scheme corridor, including the provision of a green bridge at the Air Balloon roundabout. These heaven bat heave included in the assessment of impacts due to the uncertainty of these measures. The overall appriasial score is the assessment of impacts due to the uncertainty of these measures.		N/A		Large Adverse	N/A	
No.         No.         No.           Reliably metal and the second of packed and properties is agrin the subscript of any pack and dunge in use include benefit in use packed in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use include benefit in the second of any pack and dunge in use including the Context Way National Task lading to an increase the pack and the second of any pack and dunge in use including the Context Way National Task lading to an increase in pack and the second of NAL UNAL Notweek. If the second of any pack and dunge is any pack and dun			groundwater receptors (springs, streams, welland and abstractions) during construction and operation. In accordance with the TAG Unit A3 guidance, a potential impact magnitude of Moderate Adverse on a water feature of Very High importance results in a Highly Significant potential impact. Highly Significant potential impacts on two or more water features results in a Very Large Adverse Impact assessment score. Therefore, in the absence of ground investigation baseline data, and detailed design and mitigation measures, the potential impact assessment score for groundwater receptors including the Burford Jurassic groundwater body and Severn Vale – Jurassic Limestone Cotswolds Edge South groundwater body (both Great and Inferior Oolle) would be Very Large Adverse. The potential impact assessment score for surface water receptors would be Slight Adverse, due to standard mitigation measures implemented through the CEMP.	Value of four				N/A	
Communing and Other Lees         Reliability bunching have been assessed using the stress based approach set to if ALA Unit AL3 and the ALA Unit AL3	Socia		to a modern dual carriageway, with associated junction improvements. Net journey time changes are the net of positive and negatives in a given time band. Monetary (NPV) includes benefits from journey time savings, vehicle operating cost impacts and changes in user	Net jo 0 to 2min	urney time chang 2 to 5min	ges (£m) > 5min	N/A	£62.4 million	N/A
Interpretent         Interpretent<		Commuting and Other users	Appendix C.5. The outcome of this assessment has indicated a moderate beneficial impact as a result of the scheme. Monetised benefits have been estimated as a 10% uplift to travel time benefits.		£14.1 million			£14.1 million	
Accidents         N/A         Slight Beneficial (Minutability)         Slight Beneficial (Minutability)         N/A         N/A         N/A         N/A         N/A           Security         Effects on society as essuit of this option are anticipated to be Neutral, as is unikely that there on would be any changes to security indicators and therefore freedom from crime.         N/A         <			including the Cotswold Way National Trail, leading to an increase in journey times and potentially discouraging people from using routes which may result in a disbenefit for NMUs. However, the provision of new routes such as dedicated crossings, additional cycle paths and footpaths and retainment of NMU routes where possible, would have the potential to increase the number of people choosing alternative modes of transport to vehicles, such as on foot or bicycle, resulting in an improvement in the levels of physical activity. On balance, there would be an overall Slight Beneficial		N/A		Slight Beneficial	N/A	
Accidents       Areduction in the number of personal injury accidents and casualities of all types results from the conversion of the existing single carriageway section of the A417 to an modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by increases as in traffic (and accidents) in the A417 corrido attribution the net results is beneficial.       N/A       £4.3 million       N/A         Security       Effects on security as a result of this option are anticipated to be Neutral, as it is unlikely that there would be any changes to security indicators and therefore freedom from crime.       N/A       Neutral       N/A       N/A         Access to services       This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral.       N/A       N/A       N/A       N/A         Affordability       The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local movements will experience increases in journey distance as a result of the scheme.       N/A       N/A       N/A       N/A         Severance       There is one community facility within 250m of this option and there is the potential for severance to occur to additional facilities would be an overall Neutral effect on severance to use approximately six NMU routes, including tooptarbs, National Traits and cycle paths, which could lead to N/A       Neutral       N/A       N/A         Option and non-use values       The scheme does not include measures that will subatantially change the avaliability of transp		Journey quality	new signs and potentially new laybys, the locations of which would be identified at Stage 2. The implementation of an appropriate landscape design would restrict views to the wider area for motorists. Traveller stress is predicted to slightly improve with this option in place for vehicle travellers; with a reduction in frustration due to better journey times and reliability, route uncertainty with good design and layout of new and existing signs and also in the fear of potential accidents through the delivery of new NMU facilities and safety related infrastructure. For NMUs, journey times and reliability are likely to alter with numerous NMU facilities likely to be directly affected, barriers between people and traffic and traffic flows for roads alongside NMU facilities are also likely to change. The potential provision of NMU facilities at appropriate locations would minimise effects on journey quality.		N/A		Slight Beneficial	N/A	
Effects of section was a result of this option are anticipated to affect access to services within the vicinity of the option and effects on N/A       Neutral       N/A       N/A         Access to services       This option is not anticipated to affect access to services within the vicinity of the option and effects on public transport accessibility would be Neutral.       N/A       N/A       N/A       N/A         Affordability       The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local movements will experience increases in journey distance as a result of the scheme.       N/A       Slight Beneficial       N/A       N/A         Severance       Option and non-use values       There is one community facilities within a column or the option. There is potential for severance to approximately six NMU routes, including tooptaths, National Traits and cycle paths, which could lead to N/A       N/A       N/A       N/A         Option and non-use values       The scheme does not include measures that will substantially change the availability of transport services in the study area.       N/A       N/A       N/A         Option and non-use values       The scheme will be funded through Central Government Funds       Central Govt funding: £286.4 million       N/A       Severance         Option and non-use values       The scheme will be funded through Central Government Funds       Central Govt funding: £286.4 million       N/A       Severance			A reduction in the number of personal injury accidents and casualties of all types results from the conversion of the existing single carriageway section of the A417 to a modern dual carriageway, with associated junction improvements. Savings on the improved section are offset to a degree by		Reduction in casualti Fatal: 2.0 Serious: 13.1		N/A	£4.3 million	N/A
Independent of the tangate of the tangate of the sector of public transport accessibility would be Neutral.         N/A         Neutral         N/A         N/A           Affordability         The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local movements will experience increases in journey distance as a result of the scheme.         N/A         Slight Beneficial         N/A         N/A           Severance         There is one community facilities yuthin 250 mort this option and here is the potential for severance to approximately six NMU routes, including footpaths, National Trails and cycle paths, which could lead to N/A         N/A         N/A         N/A         N/A           Option and non-use values         The scheme does not include measures that will substantially change the availability of transport services in the study area.         N/A         N/A         N/A         N/A           Option and non-use values         The scheme will be funded through Central Government Funds         Central Govt funding: £286.4 million         N/A         Severance		-	would be any changes to security indicators and therefore freedom from crime.					N/A	N/A
Severance       There is one community facility within 250m of this option and there is the potential for severance to occur to additional facilities further than 250m from the option. There is potential for severance to approximately six NMU routes, including tooptaths, National Traitis and cycle paths, which could lead to NMUs being dissuaded from making journeys to facilities. However, NMU facilities would be an overall Neutral effect on severance in possible and the provision of replacement and additional facilities source NMU facilities would be an overall Neutral effect on severance.       N/A       N/A       N/A         Option and non-use values       The scheme does not include measures that will substantially change the availability of transport services in the study area.       N/A       N/A       N/A         Option and non-use values       The scheme will be funded through Central Government Funds       Central Govt funding: £286.4 million       N/A       £286.4 million			public transport accessibility would be Neutral. The scheme should reduce highway journey times (and costs) for trunk road traffic. Some local						
Intersection due to base in the doct inclusion of and specific and and			There is one community facility within 250m of this option and there is the potential for severance to occur to additional facilities further than 250m from the option. There is potential for severance to approximately six NMU routes, including footpaths, National Trails and cycle paths, which could lead to NMUs being dissuaded from making journeys to facilities. However, NMU facilities would be relained where possible and the provision of replacement and additional facilities such as crossings would reduce severance impacts to journeys. On balance, there would be an overall Neutral effect on severance.	d N/A			Neutral	N/A	N/A
	0 4						Neutral	N/A	
	Publ	Budget			_				



# Appendix D – Early Assessment and Sifting Tool Plus methodology and assessment process



# 1. Transport appraisal process

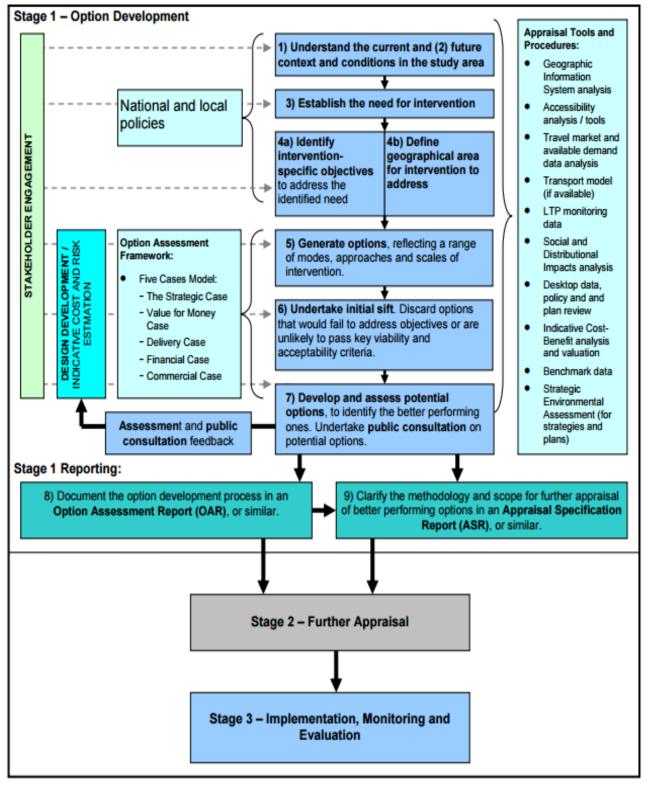
# 1.1 Introduction

- 1.1.1 The Department for Transport (DfT) has produced the Transport Analysis Guidance (WebTAG) which provides details on how transport schemes should be appraised and consists of 3 stages. Stages 1 and 2 of the Transport Appraisal Process outlined in WebTAG are intended to reduce the number of options at each sift in order to produce a Preferred Option. Stage 3 looks at the Implementation, Monitoring and Evaluation.
- 1.1.2 At Stage 1 of the Transport Appraisal Process outlined in WebTAG, potential options are generated and then sifted to promote the most suitable options available which are then taken forward for further analysis and assessment. WebTAG splits Stage 1 into 9 steps:
  - Step 1: Understanding the Current Situation
  - Step 2: Understanding the Future Situation
  - Step 3: Establishing the Need for Intervention
  - Step 4a: Identifying Objectives
  - Step 4b: Define Geographic Area of Impact to be Addressed by the Intervention
  - Step 5: Generating Options
  - Step 6: Initial Sifting
  - Step 7: Development and Assessment of Potential Options
  - Step 8: Produce Option Assessment Report, or similar
  - Step 9: Clarify Modelling and Appraisal Methodology
- 1.1.3 Steps 1 to 3 above have been considered as part of Project control framework (PCF) Stage 0 for the project, which provides an overall mandate for the project under the content of the Client Scheme Requirements (CSR). The CSR is effectively the scope of the project defined between Highways England and DfT.
- 1.1.4 Step 4 was also considered as part of PCF Stage 0. However, the approach to Stakeholder engagement has meant that a series of specific project objectives have been agreed which extend beyond the basic strategic objectives for this improvement scheme.
- 1.1.5 The scheme is at step 8 in Highways England PCF Stage 1, where an initial sift of all the options has been undertaken so that any impracticable options are discarded at an early stage, developed and assessed. No guidance has been provided in the Design Manual for Roads and Bridges (DMRB) as to the methodology for the initial sifting in Stage 1, but WebTAG suggests that "options should be considered and progressed or discarded on the basis of evidence and EAST can be used to facilitate this process". EAST is the Department for Transport's Early Assessment and Sifting Tool. The project team has augmented the EAST process to ensure that the sifting criteria are specific to this particular project and this is discussed in more detail with the following text.



1.1.6 The process is represented in the following illustration taken from the WebTAG Guidance.







# 2. Early Assessment Sifting Tool Plus

# 2.1 Background

- 2.1.1 For the initial sifting exercise an augmented version of the DfT sifting tool, Early Assessment and Sifting Tool (EAST), is used. This is referred to as EAST Plus. This section will look at all the criteria listed in the EAST spreadsheet, the limitations associated with its use and how the project team has chosen to augment the assessment criteria.
- 2.1.2 Each option has been measured against the criteria, set out below, to provide both moderation and a direct comparison between the options, before progressing to the next criteria.
- 2.1.3 Due to the limitations of EAST, a scoring system has been created for the purpose of ranking all the options based on the result of the initial sift, as EAST does not provide this. Creating a scoring system allows each option to be directly compared against one another.
- 2.1.4 EAST is split into 5 areas of consideration which looks at different aspects of the proposed options, these are:
  - Strategic
  - Economic
  - Managerial
  - Financial
  - Commercial
- 2.1.5 These are sub-divided further and are discussed in detail below.
- 2.1.6 At this stage, all options have been scored with consideration of a green bridge located on Crickley Hill.

# 2.2 Strategic

- 2.2.1 This aspect is provided to assess whether the proposed options meet with preidentified scheme objectives and it is broken down into the following areas:
  - Scale of Impact
  - Fit with wider transport and government objectives (NPS)
  - Fit with other scheme specific objectives (CSR)
  - Key Uncertainties
  - Degree of consensus over outcomes

# Scale of impact (Road Investment Strategy)

2.2.2 The Scale of Impact utilises the objectives set out in the Road Investment Strategy (RIS) (for the 2015/16-2019/20 Road Period) which are outlined below:



- Providing capacity and connectivity to support national and local economic activity
- Supporting and improving journey quality, reliability and safety
- Joining our communities and linking effectively to each other
- Supporting delivery of environmental goals and the move to a low carbon economy
- 2.2.3 Due to the development of scheme specific objectives and sub-objectives the RIS objectives will not be scored as they are a repetition of other scored objectives. Refer to Chapter 3 for full details of removed objectives of the EAST Plus Assessment.

# Fit with wider transport and government objectives (National Policy Statement).

- 2.2.4 In this section, wider transport and government objectives are identified. Using the National Policy Statement for National Networks as this reflects government and transport objectives and are set out below:
  - Environmental and Social Impacts
  - Emissions
  - Safety
  - Technology
  - Sustainable Transport
  - Accessibility
  - Road tolling and charging
- 2.2.5 The Environmental and Social Impacts and Emissions measures will be assessed individually and will be scored on a scale of 1-5 to reflect the existing choices provided in EAST. The table below, found in the EAST Guidance, shall be used to assist in the scoring of each option.

Rating	Description	Expanded definition	
1	Poor fit	There is significant conflict with other policies / options affecting the study area which needs to be resolved. Possibly also conflicts with other modes.	
2	Low fit	There is some conflict with other policies / options or modes.	
3	Reasonable fit	Overall the option fits well with other policies affecting the study area.	
4	Good fit	The option fits very well with other policies affecting the study area.	
5	Excellent fit	Option complements other policies/proposals affecting study area, has no negative impacts on other modes or outcomes and demonstrates 'doing more with less'.	

#### Table 2.1: Fit with wider transport and government objectives

Source: Early Assessment and Sifting Tool (EAST) Guidance

2.2.6 For the measure, does the option make use of technology, all routes have been scored as "Reasonable Fit" as technology details are not known at this stage of the project. The existing will score poor as it has limited technology.



- 2.2.7 For the measure, road tolling and charging, all routes will be scored not applicable (N/A) as this has not been proposed on any of the options put forward.
- 2.2.8 Safety, Sustainable Transport and Accessibility measures will not be scored as they are repetition of the scheme objectives. Refer to Chapter 3 for full details of removed objectives of EAST Plus assessment.

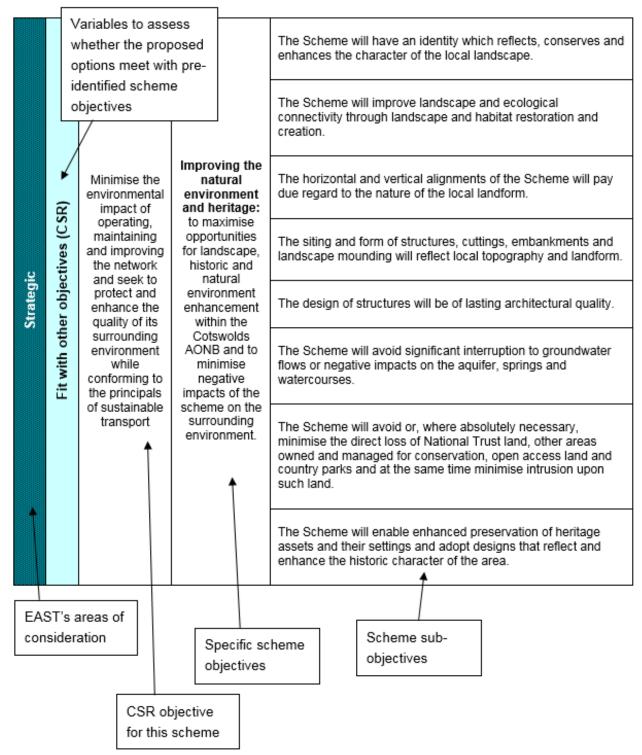
# Fit with other objectives (CSR)

- 2.2.9 This variable refers to how well the proposed options are aligned with other objectives. It is usual to replicate the Client Scheme Requirements (CSR) as they are considered to represent scheme specific objectives. However, given the landscape led approach to the scheme and the interest of specific stakeholders, the project team, working closely with stakeholders, have developed a series of scheme specific objectives and sub objectives. Refer to Section 2 of the Technical Appraisal Report for full list of specific scheme objectives and sub-objectives.
- 2.2.10 These objectives and sub-objectives have been mapped against the CSR objectives to produce a top down cascade of information that fits within the overall RIS objectives. Refer to Figure 2.1 as an example of the mapping of the objectives.
- 2.2.11 The CSR objectives for this scheme are:
  - Improve the operation and efficiency of the existing transport network
  - Deliver capacity enhancements to the strategic road network
  - Safety improvements for customers and operational staff
  - Support economic growth
  - Improve connectivity and community cohesion
  - Enhance & protect the quality of the surrounding environment while conforming to the principles of sustainable transport
- 2.2.12 The specific scheme objectives are:
  - Safe, resilient and efficient network: to create a high quality resilient route that helps to resolve traffic problems and achieves reliable journey times between the Thames Valley and West Midlands as well as providing appropriate connections to the local road network.
  - **Supporting economic growth:** To facilitate economic growth, benefit local businesses and improve prosperity by the provision of a free-flowing road giving people more reliable local and strategic journeys.
  - **Community & access:** to enhance the quality of life for local residents and visitors by reducing traffic intrusion and pollution, discouraging rat-running through villages and substantially improving public access for the enjoyment of the countryside.



• Improving the natural environment and heritage: to maximise opportunities for landscape, historic and natural environment enhancement within the Cotswolds Area of Outstanding Natural Beauty (AONB) and to minimise negative impacts of the scheme on the surrounding environment.







2.2.13 More details of the scheme objectives and sub objectives are provided within Chapter 2 of the Technical Appraisal Report. Each option was scored against these objectives using the scoring criteria in table 2.2.

#### Table 2.2: Fit with other objectives

Rating	Description	Expanded definition	
1	Poor fit	There is significant conflict with other objectives / options affecting the study area which needs to be resolved. Possibly also conflicts with other modes.	
2	Low fit	There is some conflict with other objectives / options or modes.	
3	Reasonable fit	Overall the option fits well with other objectives affecting the study area.	
4	Good fit	The option fits very well with other objectives affecting the study area.	
5	Excellent fit	Option complements other objectives / proposals affecting study area, has no negative impacts on other modes or outcomes and demonstrates 'doing more with less'.	

Source: Early Assessment and Sifting Tool (EAST) Guidance

### Rationalisation

2.2.14 The use of a hierarchical mapping process from the RIS objectives (which are linked to the NPS outcomes), through the CSR to the specific scheme objectives and sub-objectives ultimately leads to some repetition. A clear display of this is the inclusion of connectivity objectives at nearly every level. It has therefore been necessary to rationalise the content of the strategic objectives to ensure that these objectives do not gain higher weightings through repetition. Where this repetition is identified the specific scheme objectives and sub-objectives will be selected to represent the content of the objective. Full details of strategic objectives removed from the EAST Plus assessment are shown in Chapter 3.

#### Key uncertainties

2.2.15 In this section a text box is available to input any key uncertainties that are associated with the proposed options. No score has been provided for this section.

#### Degree of consensus over outcomes

2.2.16 This section seeks to assess the level of consensus that will be achieved for each of the proposed schemes. The Table below shows the scoring criteria.

#### Table 2.3: Degree of consensus over outcomes

Rating	Description
1	Little or no consultation has taken place yet, or consultation has revealed a high level of disagreement about the option's ability to deliver the stated outcomes.



Rating	Description		
2	Little consultation and/or strong reasons to suggest the outcomes are controversial.		
3	Some consultation has taken place with some agreement.		
4	Wide consultation and broad agreement on the outcomes, possibly one or two areas of disagreement remaining.		
5	Extensive consultation has taken place with a high degree of consensus on the outcomes.		

Source: Early Assessment and Sifting Tool (EAST) Guidance

2.2.17 Due to the extended period of time between Stage 1 and earlier options identification phases in the early 2000's, all options will be scored 1, little or no consultation.

# 2.3 Economic

- 2.3.1 For the Economics field, EAST provides a Red, Red-Amber, Amber, Green-Amber and Green (RAG) responses to answer the relevant fields. This is subjective as there is no direct correlation with how the sub-headings have been scored in the following sections:
  - Economic growth
  - Carbon emissions
  - Socio-distributional impacts
  - Local environment
  - Well Being
- 2.3.2 To respond to this section accurately and remove the opportunity to be subjective, they are scored using a 7-point scale (-3 to +3) based on the DfT TAG Unit A3 Environmental Impact Appraisal to answer all the questions provided under each heading. This system shall be used to replace the RAG analysis as it does not provide a sufficiently fine analysis to distinguish between the options.

Impact	Score
Largely beneficial	+3
Moderately beneficial	+2
Slightly beneficial	+1
Neutral	0
Slightly adverse	-1
Moderately adverse	-2
Largely Adverse	-3

Table 2.4: 7-point Scale used

Source: DfT TAG Unit A3 – Environmental Impact Appraisal



# Economic growth

- 2.3.3 In EAST, economic growth is further broken down into 5 criteria which are:
  - Connectivity
  - Reliability
  - Resilience
  - Delivery of housing
  - Wider economic impacts
- 2.3.4 Under each of these headings, EAST provides questions allowing the respondent to answer each of the proposed options in a standardised way.
- 2.3.5 For connectivity, respondents are asked to determine whether the proposed option will provide a journey that is shorter/quicker and/or cheaper compared to the existing A417. At Stage 1 this will be based on the proposed route lengths to determine journey times. All the options will have a beneficial impact as the existing route has two at grade junctions and all the proposed solutions are anticipated to have grade separated junctions allowing the free flow of traffic. The shortest routes will score better. See below the criteria adopted to score connectivity base on route length.

Option Length	Impact	Score
<6000 m	Largely beneficial	+3
6000 – 6500 m	Moderately beneficial	+2
>6500 m	Slightly beneficial	+1
N/A	Neutral	0
N/A	Slightly adverse	-1
Existing route (at grade junctions)	Moderately adverse	-2
N/A	Largely adverse	-3

#### Table 2.5: Option length based scores for connectivity

- 2.3.6 The objective "Does it have an impact on the cost of travel (vehicle operating costs, fares, etc.)?" has been removed as it is repeated within the Carbon missions and well-being objectives. Refer to Chapter 3 for details of objectives removed from the assessment criteria.
- 2.3.7 Under the section devoted to reliability, it has been determined whether each of the proposed options will have any variation in their day-to-day journey times, this will allow for gradient and the distance of each option and it susceptibility to bad weather. It will also need to be determined what the impact on the number of incidents compared to the existing A417 will be.
- 2.3.8 Resilience provides an opportunity to judge what impact each option has on the resilience of the network due to terrorism, severe weather conditions or long-term effects due to climate change.



- 2.3.9 Delivery of housing will determine what impact the individual options have on their ability to support a specific planned development and/or has the ability to provide additional road capacity that will facilitate future housing without causing deterioration in traffic conditions. All options have been scored slightly beneficial as all will facilitate new housing development in the wider catchment.
- 2.3.10 In wider economic impacts the respondent has an opportunity to note whether there will be any impacts relating to that option which will need further analysis in the appraisal process.

# **Carbon emissions**

- 2.3.11 Carbon emissions is split into 5 different sections these are:
  - Activity
  - Embedded carbon
  - Carbon content
  - Efficiency
  - Overall effect on carbon emissions
- 2.3.12 The purpose of activity is to consider whether the proposed scheme will lead to a change in public transport usage or if the number of private vehicle trips and journey lengths will be altered by the proposed option. The proposed option has been measured against their anticipated vehicle-km change for all transportation modes based on a Do-Nothing scenario. A score based on options length assuming constant flow has been adopted and it is shown in the table below.

Option length	Impact	Score
< 5500 m	Largely beneficial	+3
5500 – 6000 m	Moderately beneficial	+2
6000 – 6500 m	Slightly beneficial	+1
6500 – 7000 m	Neutral	0
> 7000 m	Slightly adverse	-1
N/A	Moderately adverse	-2
N/A	Largely Adverse	-3

#### Table 2.6: Option length based scores

- 2.3.13 The section devoted to embedded carbon, asks whether "significant construction work is required?" In this section it is not considered appropriate to use the 7-point scale used elsewhere in the economics section and therefore a binary score system will be applied where No will receive a 0 score and Yes will receive a -1. All options have been scored as yes as major works are required for all of them.
- 2.3.14 The section carbon content, aims to distinguish the options by the type of fuel to be used. Since all the options are at an early stage it is expected that the same



fuel type will be used and therefore all options have received the same Neutral score of 0.

2.3.15 In the Efficiency category, it must be determined whether the option will cause a more efficient use of vehicles or a change in behaviour of drivers compared to the existing situation. The options have been assessed based on the proposed vertical gradient. There is no score for routes with a gradient greater than 10% as these will be removed through the engineering assessment. Refer to Chapter 5 of the Technical Appraisal Report for the options gradients.

Vertical Gradient	Impact	Score
< 6%	Largely beneficial	+3
6% - 8%	Moderately beneficial	+2
8% - 9%	Slightly beneficial	+1
9% - 10%	Neutral	0
> 10%	Slightly adverse	-1
N/A	Moderately adverse	-2
N/A	Largely adverse	-3

#### Table 2.7: Criteria for gradient based scores

2.3.16 EAST requires that the overall effect on carbon emissions for the proposed options are assessed. These scores have been based on distance of each alignment assuming constant flow and this criteria is shown in the table below.

Option length	Impact	Score
< 5500 m	Largely beneficial	+3
5500 – 6000 m	Moderately beneficial	+2
6000 – 6500 m	Slightly beneficial	+1
6500 – 7000 m	Neutral	0
> 7000 m	Slightly adverse	-1
N/A	Moderately adverse	-2
N/A	Largely Adverse	-3

#### Table 2.8: Route option length based scores

### Socio-distributional impacts and the regions

- 2.3.17 This section seeks to measure what the social impacts will be due to the proposed options. This aspect is further broken down into three sections:
  - Social and distributional impacts and the regions
  - Regeneration
  - Regional imbalance
- 2.3.18 Social and distributional impacts and the regions is measured against 8 social and distributional impacts (SDIs) which are noise, air quality, severance,



accessibility, personal affordability, accidents, security and user benefits. As all these impacts are repeated in other scored measures, the SDI metric will be discounted. Refer to Chapter 3 for full details of removed objectives from the EAST Plus assessment.

- 2.3.19 Regeneration seeks to measure what impact the scheme will have on a targeted regeneration area and what the impact will be. The options will be assessed against how well they will facilitate development. All options have been scored neutral because it is not a targeted regeneration area.
- 2.3.20 Regional imbalance is intended to identify whether the scheme is in a region which is underperforming compared to the rest of the country. In addition to this, the respondent is required to determine whether the individual options will impact economic growth within the region.
- 2.3.21 There are 2 metrics to score the regional imbalance. The first one is "If this is a weak region, what is the impact of the option on the region?" in which all options have been scored neutral as is not a weak region. The second metric is "How will this impact economic growth?" in which all options are scored largely beneficial due to the regional economy and standard of living.

# Local environment

- 2.3.22 This aspect of EAST looks to determine the impact each of the potential options will have on the local environment and has been split into 4 sections provide below:
  - Air quality
  - Noise
  - Natural environment, heritage and landscape
  - Streetscape and urban environment
- 2.3.23 The section devoted to air quality looks to evaluate whether the options comply with the Air Quality Strategy for the UK, which has set limits for 9 air pollutants and 2 for the protection of ecosystems. The table below shows the scoring against air quality depending of the impact that each option will have.

#### Table 2.9: Scoring for air quality impact on proposed options

Impact	Score
Largely beneficial	+3
Moderately beneficial	+2
Slightly beneficial	+1
No change	0
Slightly adverse	-1
Moderately adverse	-2
Largely beneficial	-3



2.3.24 Also under air quality, EAST asks the respondent to determine if any Air Quality Management Areas (AQMAs) are located within the scheme extents. If an AQMA is found to be present then it must be determined how many households will be impacted, the table below sets out how is intended to score this section if an AQMA is present. If an AQMA is not present, then it must be determined whether an AQMA will need to be created to reflect the impact of the new route and the scoring for this scenario is provided in table below.

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Table 2.10: Scoring for p	proposed options	where an AQIVIA	is already present

AQMA present	Households affected	Score
Yes	Many	+2
Yes	Few	+1
No	Few	-1
No	Many	-2

2.3.25 For evaluation of noise 2 metrics are scored. One will measure the impact of each option on the reduction of disturbance from noise. The table below shows the scoring criteria that will be adopted depending on the impact.

#### Table 2.11: Scoring for air quality impact on proposed options

Impact	Positive impact
Largely beneficial	+3
Moderately beneficial	+2
Slightly beneficial	+1
No change	0
Slightly adverse	-1
Moderately adverse	-2
Largely adverse	-3

- 2.3.26 For the other metric, a reference should be made to the DEFRA Noise Action Plan to determine whether the proposed options will have an impact on an existing noise problem area. If the option will affect a Noise Important Area then the option will receive a score of 0 otherwise it will receive a +1 score.
- 2.3.27 Natural environment, heritage and landscape gives the respondent the opportunity to determine what the overall impact on the natural environment is. The scoring criteria adopted is shown in the table below. Where this impact will be assessed as negative, a second question must be answered to assess the value of the environment affected. For this question, a binary scoring system will be applied, where High receives 0 and Low a +1 score.



Table 2.12: Scoring for natural environment, heritage and landscape impact on proposed options

Impact	Positive impact
Largely beneficial	+3
Moderately beneficial	+2
Slightly beneficial	+1
No change	0
Slightly adverse	-1
Moderately adverse	-2
Largely adverse	-3

2.3.28 Streetscape and urban environment gives the respondent an opportunity to determine what the impact of the proposed options will be on the urban environment. The same scoring criteria than for the metric above will be used to score this one. As in the previous case, where the impact is assessed to be negative, a second question must be answered to assess the value of the environment affected with the same binary scoring system applied.

### Well being

2.3.29 This section of EAST consists of the following sections:

- Severance
- Physical activity
- Injury or deaths
- Crime
- Enjoying access to a range of goods, services, people and places
- 2.3.30 For the severance criteria it will need to be determined what impact the proposed options will have on existing routes and the impact on all road users including Non-Motorised Users. The 2 metrics to measure the severance ask the respondent to assess the impact of each option against the increase of the possibility of cross street / corridor connections between neighbourhoods and if more or less people will be outside the public realm as a result. The criteria or the scoring of the first question is shown in the table 2.13. For the second one, all options will score neutral as there is no public realm in the area.

Impact	Score
Largely beneficial	+3
Moderately beneficial	+2
Slightly beneficial	+1
No impact	0
Slightly adverse	-1
Moderately adverse	-2
Largely adverse	-3

Table 2.13: Scoring for connectivity impact



- 2.3.31 For physical activity, it must be determined whether the options will have an impact on physical activity levels and impacts an area of deprivation or poor health. As the proposed options will not have an impact, all receive a Neutral Score of 0.
- 2.3.32 For injury or deaths, it is determined whether the proposed options will lead to decreased Killed and Serious Injuries (KSIs) compared to the existing A417, based on evidence of similar standard roads. Consideration should also be given to how the proposals shall be maintained and what risk this poses to maintenance workers.
- 2.3.33 All options will need to be assessed to determine their impact on crime and the impact it will have on people's fear of crime. All the options will be given a Neutral score as all will have the same impact on crime.
- 2.3.34 In enjoy access to a range of goods, services, people and places, it must be determined what impact the option will have on journey time, reliability, access to key services, journey time reliability and the number of traffic incidents. The scoring criteria for this metric is shown in the table below

Impact	Positive impact
Largely beneficial	+3
Moderately beneficial	+2
Slightly beneficial	+1
No impact	0
Slightly adverse	-1
Moderately adverse	-2
Largely adverse	-3

#### Table 2.14: Scoring Enjoy access to a range of goods, services, people and places

- 2.3.35 Metrics related with journey time and journey time reliability will be removed in this section as they are repeated in the economic growth section. Refer to Chapter 3 for details of objectives removed from the assessment criteria.
- 2.3.36 Metrics assessing the impact on the cost travel and the number of incidents have been scored based on options length assuming constant flow. The criteria is shown in the table below.

#### Table 2.15: Option length based scores

Option length	Impact	Score
< 5500 m	Largely beneficial	+3
5500 – 6000 m	Moderately beneficial	+2
6000 – 6500 m	Slightly beneficial	+1
6500 – 7000 m	Neutral	0
> 7000 m	Slightly adverse	-1



Option length	Impact	Score
N/A	Moderately adverse	-2
N/A	Largely Adverse	-3

### Expected value for money category

- 2.3.37 EAST categorises value for money (VfM) into the following ranges based on the Benefit Cost Ratio (BCR):
  - Poor (<1)
  - Low (1 1.5)
  - Medium (1.5 2)
  - High (2 4)
  - Very High (>4)
- 2.3.38 The assessment of VfM does not consider Monetisation of Landscape.

# 2.4 Managerial

#### Implementation tables

- 2.4.1 The purpose of this section is to provide an estimate of the timescales for each option from inception to delivery. As the A417 is being developed as part of the RIS1, construction will be required to start early in RIS2 currently identified as mid-2021, with an assumption made that the construction duration will be in the order of 3 years for all proposed options.
- 2.4.2 This section will be scored using the options provided in EAST which provides a score on a scale of 1-7, where 1 is for a scheme that will be completed within 1 month and 7 for a scheme that will require more than 10 years. This conflicts with the scoring system that has been devised to compare the options, as a longer implementation should score less than those with a shorter timetable. To resolve this issue, the rating in EAST was amended so as to be compatible with the intended scoring system and is shown below.

Rating provided in EAST	Score
-1 Months	7
-6 Months	6
-12 Months	5
-2 Years	4
-5 Years	3
-10 Years	2
0+ Years	1

Table 2.16: Scoring system for implementation timetable



2.4.3 All options will require 5-10 years to implement as they are required to follow the Development Consent Order (DCO) process and are anticipated to begin construction mid-2021.

## Public acceptability

- 2.4.4 This field provides an opportunity to say if there are any perceived issues with the public. The result for this section will be on a scale of 1-5 with 1 being low acceptance and 5 being high. This reflects the options provided directly within EAST.
- 2.4.5 All options will be scored as medium acceptability as they have not all been presented to stakeholders at this early stage.

# Practical feasibility

- 2.4.6 The practical feasibility section is devoted to determining whether the options being analysed have been tested and have produced outcomes that are both practicable and effective, taking into account any local planning decisions in the area and the practicality in constructing the proposed option.
- 2.4.7 The EAST Guidance document asks the respondent to identify who will operate the scheme and whether the operator will have the legal statutory powers to do so. At this early stage all options are considered to be operated by Highways England. The existing A417 route is currently managed through a Design, Build, Finance and Operate contract or DBFO due to cease in 2026. As the proposed Missing Link solution will be completed within approximately 2 years of the end of the DBFO contract it is assumed Highways England will operate the new section of carriageway until handover of the remainder of the A417.
- 2.4.8 Ease of construction will be reviewed in this section. Off-line and a combination of off-line / on-line construction methods will be considered here.

### Quality of the supporting evidence

- 2.4.9 This section allows the user to evaluate the quality of the supporting evidence that has been used to sift the proposed options. All options will be scored as reasonable, as the level of evidence available is considered to be the same at PCF Stage 1.
- 2.4.10 A scale of 1-5 has been used which reflects the available responses provided in EAST, with the table below provided in the EAST Guidance.



#### Table 2.17: Quality of supporting evidence

Rating	Description
1	Low level of supporting evidence – a scheme in the very early stages of development that has not been implemented elsewhere with little supporting data and/or analysis.
2	Poor level of supporting evidence – may be some underlying data or some informal analysis.
3	Reasonable level of supporting evidence – good underlying data explaining the problem and some analysis of the outcomes.
4	Good level of supporting evidence, possibly including some modelling and/or sensitivity testing demonstrating robust outcomes.
5	High level of supporting evidence – option has been modelled in detail or subjected to a Transport Business Case appraisal.

Source: Early Assessment and Sifting Tool (EAST) Guidance

# Key risks

2.4.11 This section is provided to enable the respondent to note in a text field any key risks that have been identified with that particular option. Any risk provided here should be reflected in other fields to ensure that the risk has been captured. This section is not scored.

# 2.5 Financial

- 2.5.1 This section sets out the financial impacts of all the proposed schemes. Where available, estimates of the costs associated with each option should be provided, as this enables a direct comparison of all the proposed options. Where values are provided, present values should be used, discounted to the Department of Transport's standard base year as 'this implies that benefits received far in the future are given less weight than benefits received today'.
- 2.5.2 Financial aspects are split into 5 areas of consideration and are given below:
  - Affordability
  - Capital costs
  - Revenue costs
  - Cost profile
  - Overall cost risks
- 2.5.3 The 5 areas considered will be reviewed and scored however due to the uncertainty around budgets for the scheme at PCF Stage 1 the areas will not be included in the overall ranking of the EAST Plus outputs.

# Affordability

2.5.4 The purpose of this section is to set out whether the scheme is to be considered affordable in terms of the available budget as well as the budget period.



- 2.5.5 This section will be scored on a scale to reflect the responses provided in EAST, with 1 being unaffordable and 5 being affordable. As the scheme is being developed as part of the RIS1, all the potential options must be ready for construction, planned to begin early in RIS2, currently identified as mid-2021.
- 2.5.6 At the time of writing Highways England has a budget of £255m. There is no fixed budget for the scheme but for the purpose of this assessment the following criteria applies.

#### Table 2.18: Affordability criteria

Cost	Affordability	Value for final score
> 600 m	Not affordable	1
500 – 600 m		2
400 – 500 m		3
300 – 400 m		4
< 300 m	Affordable	5

2.5.7 Affordability will be removed from the overall score due to the uncertainty concerning the budget.

### Capital costs

- 2.5.8 This field provides the ability to supply the estimated capital costs of all the potential options. In EAST the capital cost is scored on a scale of 1-10, with 1 being the lowest scheme estimate and 10 being the most expensive.
- 2.5.9 At Stage 0, only 1 option was costed by Highways England, Option 12 or the Modified Brown Route. This option estimate (£255m) will be used as a basis to develop indicative costs for all 20 options to enable this field to be scored.
- 2.5.10 At this stage no schemes will be removed based on capital cost due to the consensus that the current Highways England budget does not align the scale of the project.
- 2.5.11 The capital cost ranges used to score the options are shown below.

Capital cost	Value for final score
0 – 100 million	1
100 – 200 million	2
200 – 300 million	3
300 – 400 million	4
400 – 500 million	5
500 – 600 million	6

#### Table 2.19: Capital cost criteria



Capital cost	Value for final score
600 – 700 million	7
700 – 800 million	8
800 – 900 million	9
> 900 million	10

2.5.12 Capital cost will be removed from the overall score.

#### Revenue costs

2.5.13 This figure provides an estimate of the maintenance and other costs that will be required for upkeep. At this stage in the scheme it is not possible to say how many new structures will be required, pavement layout or the drainage strategy will be and it is therefore decided to nullify this section.

### Cost profile

- 2.5.14 For cost profile an assessment will need to be made as to whether previous assessments have fully considered all the implementation, operation, maintenance and enforcement costs including administration. Consideration should also be made to determine whether there is the potential for a disproportionate burden on small business and can this be mitigated.
- 2.5.15 It is decided to nullify this measure as no cost profile for the options can be determined at this stage.

#### **Overall cost risk**

2.5.16 In this section an assessment of the options overall cost risk on a scale of 1-5, where 1 is high risk and 5 is low risk. Where a cost risk has not been considered in other fields, it may be pertinent to include them here. Any supporting evidence based on the experiences of cost variations where relevant should be provided here.

# 2.6 Commercial

#### Flexibility of option

- 2.6.1 This field will be used to say what flexibility for changing the features of the proposed options based on the level of funding available. At this early stage it is expected that some changes will be made to the alignment of the proposed options. All options are proposed to be grade-separated and have free-flowing junctions.
- 2.6.2 This field will be scored on a scale of 1-5 to reflect the options provided in EAST, where 1 is static and 5 is dynamic.



# Where is funding from?

2.6.3 The A417 Missing Link is being undertaken as part of the Road Investment Strategy (RIS) with the development phases within RIS 1 and construction in RIS 2. As such, it is anticipated that the majority of the funding for the scheme is being provided by Highways England. However during PCF Stage 1, Option Identification, Gloucester County Council have provided £1 million of funding towards the scheme development costs.

### Any income generated

2.6.4 As at this stage there is no intention for any of the options to generate any type of further income all the options will be scored 1 – None.

# 2.7 Scoring

- 2.7.1 Once the fields in EAST are completed it is necessary to convert the answers provided into an overall score. This will be achieved by adding together all of the individual scores that the proposed options received when measured against all the criteria. This allows the options to be directly compared against each other.
- 2.7.2 It is essential that the sifting process is inclusive and robust and that the initial sift should maximise the range of options going forward to the next stage. To maximise the effective range of options going forward it was agreed to take the best performing routes from each corridor through into the next element of the evaluation.

# 3. Removed objectives from EAST Plus assessment

	Identified problems and objectives of the option	EAST Headings	Sub-headings / objectives	Objectives removed	Comments	Objectives conserved	EAST Headings and sub heading	
		Providing capacity and connectivity to support national and		Providing capacity and connectivity to support national	Capacity repeat - Removed	The scheme will be designed to provide greater road traffic capacity, improved network resilience and better journey time reliability for strategic and local journeys.	Strategic - fit with other objectives CSR - Safe, resilient and efficient network	
		local economic activity		and local economic activity	from overall	The scheme will reduce rat-running on local roads through provision of a more reliable strategic route with improved capacity, thereby enhancing the amenity of local settlements.	Strategic - fit with other objectives CSR - Community and access	
		Supporting and				Road safety will be improved by designing to current standards and better separating strategic and local traffic.	Strategic - fit with other objectives CSR - Safe, resilient and efficient network	
		improving journey quality, reliability and safety		Supporting and improving journey quality, reliability and safety		What impact does the option have on the number injured or killed in traffic accidents?	Economic - Wellbeing - Injury or deaths	
	t (RIS)					What will happen to the number of incidents?	Economic - Wellbeing - Enjoying access to a range of goods, services, people and places	
Strategic	lle of impac					The scheme will enhance community cohesion by improving local connectivity and accessibility by helping to separate strategic and local traffic.	Strategic - fit with other objectives CSR - Community and access	
	Sca	Joining our communities and linking effectively to each other		Joining our communities and linking effectively to each other	Connectivity repeat - Removed from overall	Does it increase the possibility of cross street/corridor connections between neighbourhoods	Economic - Wellbeing - Severance	
						Does the option improve access to key locations (supermarkets, doctors, hospitals, etc.)?	Economic - Wellbeing - Enjoying access to a range of goods, services, people and places	
		Supporting delivery of environmental goals and the move to a low carbon		Supporting delivery of environmental goals and the move to a low carbon economy	Carbon emissions repeat - Removed from overall	Does option help the government meet its targets to reduce emissions in terms of carbon and air quality?	Strategic - Fit with wider transport and government objectives (NPS) - Emissions	
		economy				Overall effect on Carbon emissions	Economic - Carbon emissions - Overall effect on Carbon emissions	
	Fit with wider transport and government objectives (NPS)	Safety Has the opportunity been made to improve road safety, including introducing the most modern and efficient safety		Has the opportunity been made to improve road safety, including introducing the most modern and efficient safety measures where proportionate	Safety repeat - Removed from overall	Road safety will be improved by designing to current standards and better separating strategic and local traffic.	Strategic - fit with other objectives CSR - Safe, resilient and efficient network	



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	]		measures where proportionate			What impact does the option have on the number injured or killed in traffic accidents?	Economic - Wellbeing - Injury or deaths	
						What will happen to the number of incidents?	Economic - Wellbeing - Enjoying access to a range of goods, services, people and places	
			Does option assist in			The scheme will improve continuity to public rights of way (including the Cotswold Way National Trail and Gloucestershire Way).	Strategic - fit with other objectives CSR - Community and access	
		Sustainable Transport	developing cycling and walking networks?	Does option assist in developing cycling and walking networks?	Walking and cycling repeat - Removed from overall	The scheme will enhance community and recreational opportunities through improved provision for motorised and non-motorised users.	Strategic - fit with other objectives CSR - Community and access	
						What impact does the option have on levels of physical activity	Economic - Wellbeing - Physical activity	
			Does option assist in creating a more accessible network	Does option assist in creating a		The scheme will enhance community cohesion by improving local connectivity and accessibility by helping to separate strategic and local traffic.	Strategic - fit with other objectives CSR - Community and access	
		Accessibility	that provides a range of opportunities and choices for people to	more accessible network that provides a range of opportunities and choices for people to connect with job, services and friends and	Connectivity repeat - Removed from overall	Does it increase the possibility of cross street/corridor connections between neighbourhoods	Economic - Wellbeing - Severance	
			connect with job, services and friends and family?	family?		Does the option improve access to key locations (supermarkets, doctors, hospitals, etc.)?	Economic - Wellbeing - Enjoying access to a range of goods, services, people and places	
	ic c		Does it have an			Does vehicle-km change?	Economic - Carbon emissions - Activity	
	Economic growth		impact on the cost of travel (vehicle operating costs, fares, etc.)?	Does it have an impact on the cost of travel (vehicle operating costs, fares, etc.)?	Vehicles km repeat - Removed from overall	Does it have an impact on the cost of travel (vehicle operating costs, fares, etc.)?	Economic - Wellbeing - Enjoying access to a range of goods, services, people and places	
	mpacts		Does the option have			Does this option reduce absolute disturbance from noise?	Economic - Local environment - Noise	
	impa ns		an impact on accessibility/			What impact does the option have on local air quality?	Economic - Local environment - Air quality	
mic	tional i region	Social and	affordability/ availability/	Does the option have an impact on accessibility/ affordability/	Impacts repetition - Removed	Does it increase the possibility of cross street/corridor connections between neighbourhoods	Economic - Wellbeing - Severance	
Economic	distribut and the	Distributional Impacts	acceptability for vulnerable groups (low income,	availability/ acceptability for vulnerable groups (low income, disabled, the elderly, etc.)?	from overall	The scheme will enhance community cohesion by improving local connectivity and accessibility by helping to separate strategic and local traffic.	Strategic - fit with other objectives CSR - Community and access	
	Socio-		disabled, the elderly, etc.)?			What impact does the option have on the number injured or killed in traffic accidents?	Economic - Wellbeing - Injury or deaths	
	Ň					What impact will this option have on crime?	Economic - Wellbeing - Crime	
	Well being	Enjoying access to a range of goods, services, people and places	What impact does it have on end-to-end journey time?	What impact does it have on end- to-end journey time?	Journey time repeat - Removed from overall	What impact does it have on end-to-end journey time?	Economic - Economic growth - Connectivity	



			time or average	Impact on day-to-day variability in journey time or average minutes of lateness?	Journey time variability repeat - Removed from overall	Impact on day-to-day variability in journey time o average minutes of lateness?
--	--	--	-----------------	----------------------------------------------------------------------------------	-----------------------------------------------------------	---------------------------------------------------------------------------------



or Economic - Economic growth - Reliability	
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# 4. Option lengths and gradients

Table 4.1: O	ption le	engths	and	gradients

Option	Length (m)	Gradient (%)
1	5,034	8
2	5,266	8
3	4,722	8.6
5	6,100	8
6	5,665	8
7	7,985	8
9	5,357	8
12	6,430	8.4
13	4,600	8
14	5,072	8
15	5,900	8.5
20	4,582	4.5
21	4,630	5
22	4,528	5.2
23	6,208	8
24	6,103	6
26	7,736	8
28	6,030	8
29	5,667	6
30	5,540	7.5



# 5. Objectives to be considered in each ranking group

# 5.1 Introduction

- 5.1.1 When developing the output table for consideration of the options the categories were divided into:
  - Scheme objectives (CSR).
  - Overall (excluding cost).
  - Captial cost / BCR.
  - Environmental objectives.
  - Landscape objectives.
  - Strategic objectives.
  - Economic objectives.
- 5.1.2 **Scheme objectives (CSR)** to include the "Fit with other objectives (CSR)" objectives (within the strategic objectives) includes the A417 objectives and sub-objectives.
- 5.1.3 **Overall** this score to include all the criteria apart from the RIS objectives, economic objectives and Value for Money (VfM).
- 5.1.4 **Capital cost / BCR** to include VfM and Financial objectives. See table below.

Economic	Expected VfM Category						
	Affordability						
	Capital Cost (£m)?						
Financial	Revenue Costs (£m)?	n/a					
	Cost Profile	n/a					
	Overall cost risk						
	Other costs	n/a					

5.1.5 **Environmental objectives** – to include all "Improving the natural environment and heritage" sub-objectives and sub-objectives 3d, 3e and 3f within the scheme objectives and the local environment objectives within the wider economic objectives. See table below.

## A417 Missing Link Technical Appraisal Report Appendices



	Identified problems and objectives of the option	EAST Headings	Sub- headings / objectives	Sub-objectives	Final criteria (including Engineering and Environmental)					
			<b>Community</b> & access: to enhance the quality of life	The Scheme will improve air quality by reducing pollution from traffic congestion.	The Scheme will improve air quality by reducing pollution from traffic congestion.					
		Quanat	for local residents and visitors by reducing traffic intrusion and	The Scheme will minimise road noise by applying sensitive noise mitigation measures where required.	The Scheme will minimise road noise by applying sensitive noise mitigation measures where required.					
		Support economic growth	pollution, discouraging rat-running through villages and substantially improving public access for the enjoyment of the countryside.	The Scheme will minimise light pollution through sensitive structural, junction, and lighting design and sign illumination.	The Scheme will minimise light pollution through sensitive structural junction, and lighting design and sig illumination.					
	Fit with other objectives (CSR)			The Scheme will have an identity which reflects, conserves and enhances the character of the local landscape.	The Scheme will have an identity which reflects, conserves and enhances the character of the local landscape. The scheme will avoid adverse impact on geology and soils					
Strategic		Minimise the environmental impact of	Improving the natural environment and heritage: to	The Scheme will improve landscape and ecological connectivity through landscape and habitat restoration and creation.	The Scheme will improve landscape and ecological connectivity through landscape and habitat restoration					
	Fit wi	operating, maintaining and improving the network	maximise opportunities for landscape, historic and	The horizontal and vertical alignments of the Scheme will pay due regard to the nature of the local landform.	The horizontal and vertical alignments of the Scheme will pay due regard to the nature of the local landform.					
		and seek to protect and enhance the quality of its surrounding environment while	natural environment enhancement within the Cotswolds AONB and to	The siting and form of structures, cuttings, embankments and landscape mounding will reflect local topography and landform.	The siting and form of structures, cuttings, embankments and landscape mounding will reflect local topography and landform.					
		conforming to the principals of sustainable	minimise negative impacts of	The design of structures will be of lasting architectural quality.	The design of structures will be of lasting architectural quality.					
		transport	the scheme on the surrounding environment.	The Scheme will avoid or, where absolutely necessary, minimise the direct loss of National Trust land, other areas owned and managed for conservation, open access land and country parks and at the same time minimise intrusion upon such land.	The Scheme will avoid or, where absolutely necessary, minimise the direct loss of National Trust land, other areas owned and managed for conservation, open access land and country parks and at the same time minimise intrusion upon such land.					



	Identified problems and objectives of the option	EAST Headings	Sub- headings / objectives	Sub-objectives	Final criteria (including Engineering and Environmental)
				The Scheme will enable enhanced preservation of heritage assets and their settings and adopt designs that reflect and enhance the historic character of the area.	The Scheme will enable enhanced preservation of heritage assets and their settings and adopt designs that reflect and enhance the historic character of the area.
				The Scheme will avoid significant interruption to groundwater flows or negative impacts on the aquifer, springs and watercourses.	The Scheme will avoid significant interruption to groundwater flows or negative impacts on the aquifer, springs and watercourses.
			What impact does the option have on local air quality?		What impact does the option have on local air quality?
		Air Quality	Is an AQMA affected? If YES: How many households are affected		Is an AQMA affected? If YES: How many households are affected
	Local environment		Is an AQMA affected? If NO: Is it likely to create the need for an AQMA?		Is an AQMA affected? If NO: Is it likely to create the need for an AQMA?
nomic		Noise	Does this option reduce absolute disturbance from noise?		Does this option reduce absolute disturbance from noise?
Econe	cal en		Does it affect a problem area?		Does it affect a problem area?
	ΓÕ	Natural environment,	What is the overall impact on the natural environment?		What is the overall impact on the natural environment?
		heritage and landscape	If negative, what is the value of the environment affected?		If negative, what is the value of the environment affected?
		Improve streetscape	What is the overall impact on the urban environment?		What is the overall impact on the urban environment?
		and urban environment	If negative, what is the value of the environment affected?		If negative, what is the value of the environment affected?



5.1.6 **Landscape objectives** – to include the landscape focused objectives within the "Improving the natural environment and heritage" sub-objectives (2a, 2b, 2c, 2d, 2e, 2g and 2h). See table below.

	Identified problems and objectives of the option	EAST Headings	Sub- headings / objectives	Sub - objectives	Final criteria (including Engineering and Environmental)				
				The Scheme will have an identity which reflects, conserves and enhances the character of the local landscape. The scheme will avoid adverse					
			Improving the natural environment	Iandscape. The scheme will improve landscape and ecological connectivity through landscape and habitat restoration and creation.	impact on geology and soils The Scheme will improve landscape and ecological connectivity through landscape and habitat restoration and creation.				
	Fit with other objectives (CSR)	Minimise the environmental impact of operating, maintaining	and heritage: to maximise opportunities for	The horizontal and vertical alignments of the scheme will pay due regard to the nature of the local landform.	The horizontal and vertical alignments of the scheme will pay due regard to the nature of the local landform.				
Strategic		and improving the network and seek to protect and enhance the quality of its	landscape, historic and natural environment enhancement within the	The siting and form of structures, cuttings, embankments and landscape mounding will reflect local topography and landform.	The siting and form of structures, cuttings, embankments and landscape mounding will reflect local topography and landform.				
	with ot	surrounding environment while	Cotswolds AONB and to minimise	The design of structures will be of lasting architectural quality.	The design of structures will be of lasting architectural quality.				
	Fit v	conforming to the principals of sustainable transport	negative impacts of the scheme on the surrounding environment.	The scheme will avoid loss of land or, where absolutely necessary, minimise intrusion upon designated nature conservation sites, National Trust land, open access land and country parks.	The scheme will avoid loss of land or, where absolutely necessary, minimise intrusion upon designated nature conservation sites, National Trust land, open access land and country parks.				
				The scheme will enable enhanced preservation of heritage assets and their settings and adopt designs that reflect and enhance the historic character of the area	The scheme will enable enhanced preservation of heritage assets and their settings and adopt designs that reflect and enhance the historic character of the area				

- 5.1.7 **Strategic** to include all strategic objectives (NPS, CSR and Degree of consensus) apart from RIS objectives.
- 5.1.8 **Economic objectives** to include all the economics objectives (Economic growth, Carbon emissions, Local environment, Wellbeing and Expected VfM Category (not scored)).



# 6. EAST Plus (v20) outputs

ld ar	entified problems d objectives of the option	EAST Headings	sub-headings / objectives	sub - objectives	final criteria (incl Engineering and Environmental)		6	7	26	3	12	15	30	2	9	13	14	20	21	22	28	1	29	5	23	24
		Providing capacity and connectivity to support national and local economic activity			Providing capacity and connectivity to support national and local economic activity	1. Small Impact 2 3 4 5 Fully addresses the identified archiem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem
		Supporting and improving journey quality, reliability and safety			Supporting and improving journey quality, reliability and safety	identified problem 1. Small Impact 2 3 4 5 Fully addresses the	3. Moderate Impact	2. Minor Impact	2. Minor Impact	4. Significant Impact	3. Moderate Impact	3. Moderate Impact	3. Moderate Impact	4. Significant Impact	4. Significant Impact	3. Moderate Impact	3. Moderate Impact	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	4. Significant Impact	3. Moderate Impact	5. Fully addresses the identified problem	3. Moderate Impact	4. Significant Impact	4. Significant Impact
Sci	le of impact (RIS)	Joining our communities and linking effectively to each other			Joining our communities and linking effectively to each other	identified problem 1. Small Impact 2 3 4 5 Fully addresses the	2. Minor Impact	4. Significant Impact	2. Minor Impact	1. Small Impact	3. Moderate Impact	2. Minor Impact	3. Moderate Impact	4. Significant Impact	4. Significant Impact	4. Significant Impact	3. Moderate Impact	3. Moderate Impact	4. Significant Impact	4. Significant Impact	4. Significant Impact	3. Moderate Impact	4. Significant Impact	3. Moderate Impact	1. Small Impact	4. Significant Impact
		Supporting delivery of environmental goals and the move to a low carbon economy			Supporting delivery of environmental goals and the move to a low carbon economy	identified problem 1. Small Impact 2	2. Minor Impact	1. Small Impact	1. Small Impact	5. Fully addresses the identified problem	1. Small Impact	2. Minor Impact	2. Minor Impact	3. Moderate Impact	2. Minor Impact	5. Fully addresses the identified problem	3. Moderate Impact	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	5. Fully addresses the identified problem	3. Moderate Impact	2. Minor Impact	2. Minor Impact	2. Minor Impact	2. Minor Impact
_		Environmental and Social Impacts	Does option minimise social impacts and improve quality of life?		Does option minimise social impacts and improve quality of life?	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	2. Low fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	4. Good fit	4. Good fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit
		Emissions	Does option help the government meet its targets to reduce emissions in terms of carbon and air quality?		Does option help the government meet its targets to reduce emissions in terms of carbon and air quality?	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	3. Reasonable Fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
		Safety	Has the opportunity been made to improve road safety, including introducing the most modern and efficient safety measures where proportionate		Has the opportunity been made to improve road safety, including introducing the most modern and efficient safety measures where proportionate	4. Good fit 5 Excellent fit																				
	Fit with wider transport and government bjectives (NPS)	Technology	Does option make use of technology?		Does option make use of technology?	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit 1. Poor fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
		Sustainable Transport	Does option assist in developing cycling and walking networks?		Does option assist in developing cycling and walking networks?	2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit																				
		Accessibility	Does option assist in creating a more accessible network that provides a range of opportunities and choices for people to connect with job, services and friends and family?		Does option assist in creating a more accessible network that provides a range of opportunities and choices for people to connect with job, services and friends and family?	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit																				
		Road tolling + charging (can this be neglected?)			n/a	n/a																				
		Improve the operation and		The Scheme will be designed to provide greater road traffic capacity, improved network resilience	The Scheme will be designed to provide greater road traffic capacity, improved network resilience and better journey time reliability for strategic and local journeys.	<ol><li>Reasonable fit</li></ol>	4. Good fit	2. Low fit	2. Low fit	5. Excellent fit	4. Good fit	4. Good fit	4. Good fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	5. Excellent fit
		efficiency of the existing transport network.	Safe, resilient and efficient	and better journey time reliability for strategic and local journeys.	The design of the scheme has a gradient that improves existing transport operations.(N.B Existing Road gradient is 8.4)	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	1. Poor fit	5. Excellent fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	5. Excellent fit	5. Excellent fit	5. Excellent fit	4. Good fit	4. Good fit	5. Excellent fit	4. Good fit	4. Good fit	5. Excellent fit
			network: to create a high quality resilient route that helps to resolve traffic problems and achieves reliable journey times	The Scheme will enhance operational efficiency, improve maintenance safety and support best value	Will provide a design that avoids technical challenges with regard structures such as bridges, tunnels and retaining walls	3. Reasonable fit 4. Good fit 5 Excellent fit	3. Reasonable Fit	1. Poor fit	1. Poor fit	1. Poor fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit
		Deliver capacity enhancements to the SRN	between the Thames Valley and West Midlands as well as providing appropriate connections to the local road network.	whole-life cost benefits.	The Scheme will enhance operational efficiency, improve maintenance safety and support best value whole-life cost benefits.		3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	4. Good fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
		Safety improvements for customers and operational staff	z -	The Scheme will consider appropriate relaxations or departures from highways standards to minimise the environmental impact of the road without compromising safety.	The Scheme will consider appropriate relaxations or departures from highways standards to minimise the environmental impact of the road without compromising safety.	5 Excellent fit	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail	No relaxation considered at this level of detail
				Road safety will be improved by designing to current standards and better separating strategic and local traffic.	Road safety will be improved by designing to current standards and better separating strategic and local traffic.	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit 1. Poor fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	5. Excellent fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit
				The Scheme will complement Development Plans published by local authorities in the region to support regional and local economic growth and prosperity.	The Scheme will complement Development Plans published by local authorities in the region to support regional and local economic growth and prosperity.	2. Low fit 3. Reasonable fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit
				The Scheme will contribute towards national transport policies that support economic growth.	The Scheme will contribute towards national transport policies that support economic growth.	2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit 1. Pnor fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit
			Supporting economic growth: To facilitate	The Scheme will contribute to the health of the local visitor economy through improved access and visitor experience of the Cotswolds AONB.	The Scheme will contribute to the health of the local visitor economy through improved access and visitor experience of the Cotswolds AONB.	2. Low fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	4. Good fit	4. Good fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
Strategic		Support economic growth	economic growth, benefit local businesses and improve prosperity by the provision of a free-flowing road giving people more reliable local	The Scheme will minimise disruption to local economic interests and businesses during both construction and operation.	The Scheme will minimise disruption to local economic interests and businesses during both construction and operation.	2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit 1. Poor fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	2. Low fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
			and strategic journeys.	The Scheme will restore redundant highways land to agricultural, public access, community or nature benefit uses where appropriate.	The Scheme will restore redundant highways land to agricultural, public access, community or nature benefit uses where appropriate.	2. Low fit 3. Reasonable fit 4. Good fit	Lack of information. Not reached this level of detail at this stage	Lack of information. Not reached this level of detail at this stage	Lack of information. Not reached this level of detail at this stage	Not reached this level	reached this level of detail at		Lack of information. Not reached this level of detail at this stage	Lack of information. Not reached this level of detail at this stage	Lack of information. Not reached this level of detail at this stage	Not reached this level	Lack of information. Not reached this level of detail at this stage	Not reached this level	Not reached this level							
				The Scheme will support the development and employment of local skills in its construction.	The Scheme will support the development and employment of local skills in its construction.	5 Excellent fit 1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
				The Scheme will seek sustainable opportunities to use locally sourced construction materials to support the local economy.	The Scheme will seek sustainable opportunities to use locally sourced construction materials to support the local economy.	3. Reasonable fit 4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
				The Scheme will enhance community cohesion by improving local connectivity and accessibility by helping to separate strategic and local traffic.	The Scheme will enhance community cohesion by improving local connectivity and accessibility by helping to separate strategic and local traffic.	3. Reasonable fit 4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
	Fit with other bjectives (CSR)			The Scheme will improve continuity of access to the public rights of way network, the Cotswold Way National Trail and the Gloucestershire Way.	The Scheme will improve continuity of access to the public rights of way network, the Cotswold Way National Trail and the Gloucestershire Way.	5 Excellent fit 1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	2. Low fit	2. Low fit	2. Low fit	3. Reasonable Fit	2. Low fit	2. Low fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	1. Poor fit	1. Poor fit	4. Good fit	4. Good fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	1. Poor fit	1. Poor fit	1. Poor fit
			Community & access: to enhance the quality of life for		The Scheme will reduce rat-running on local roads through provision of a more reliable strategic route with improved capacity, thereby enhancing the amenity of local settlements.	1. Poor fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
		Improve connectivity and community cohesion	local residents and visitors by reducing traffic intrusion and pollution, discouraging rat- running through villages and substantially improving public	The Scheme will improve air quality by reducing pollution from traffic congestion.	The Scheme will improve air quality by reducing pollution from traffic congestion.	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	3. Reasonable Fit	4. Good fit	4. Good fit	4. Good fit	2. Low fit	2. Low fit	3. Reasonable Fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit
			access for the enjoyment of the countryside.	The Scheme will minimise road noise by applying sensitive noise mitigation measures where required.	The Scheme will minimise road noise by applying sensitive noise mitigation measures where required.	1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	2. Low fit	4. Good fit	4. Good fit	4. Good fit	2. Low fit	2. Low fit	2. Low fit	4. Good fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit	4. Good fit
				The Scheme will minimise light pollution through sensitive structural, junction, and lighting design and sign illumination.	The Scheme will minimise light pollution through sensitive structural, junction, and lighting design and sign illumination.	4. Good fit 5 Excellent fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
				The Scheme will contribute towards community and recreational opportunities through improved provision for motorised and non-motorised users.			2. Low fit	2. Low fit	2. Low fit	3. Reasonable Fit	2. Low fit	2. Low fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	1. Poor fit	1. Poor fit	4. Good fit	4. Good fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	1. Poor fit	1. Poor fit	1. Poor fit

a	Identified problems and objectives of the option	EAST Headings	sub-headings / objectives	sub - objectives	final criteria (incl Engineering and Environmental)	Scoring criteria	6	7	26	3	12	15	30	2	9	13	14	20	21	22	28	1	29	5	23	24
					The Scheme will have an identity which reflects, conserves and enhances the character of the local	1. Poor fit 2. Low fit 3. Reasonable fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	1. Poor fit	4. Good fit	4. Good fit	4. Good fit	1. Poor fit	4. Good fit	4. Good fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
				The Scheme will have an identity which reflects, conserves and enhances the character of the local landscape.	landscape.	4. Good fit 5 Excellent fit 1. Poor fit 2. Low fit																				
				The Scheme will improve landscape and ecological	soils The Scheme will improve landscape and ecological	3. Reasonable fit 4. Good fit 5 Excellent fit 1. Poor fit 2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	1. Poor fit	1. Poor fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
				connectivity through landscape and habitat restoration and creation.	connectivity through landscape and habitat restoration and creation.	3. Reasonable fit 4. Good fit 5 Excellent fit 1. Poor fit	3. Reasonable Fit	2. Low fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	1. Poor fit	1. Poor fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	2. Low fit	3. Reasonable Fit
		Enhance & protect the quality of the surrounding	Improving the natural environment and heritage: to maximise opportunities for landscape, historic and	will pay due regard to the nature of the local landform.	pay due regard to the nature of the local landform.	4. Good fit 5 Excellent fit 1. Poor fit	2. Low fit	2. Low fit	2. Low fit	3. Reasonable Fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	1. Poor fit	1. Poor fit	4. Good fit	4. Good fit	4. Good fit	2. Low fit	2. Low fit	4. Good fit	3. Reasonable Fit	4. Good fit	4. Good fit
		environment while conforming to the principles of sustainable	natural environment enhancement within the Cotswolds AONB and to minimise negative impacts of	The siting and form of structures, cuttings, embankments and landscape mounding will reflect local topography and landform.	The siting and form of structures, cuttings, embankments and landscape mounding will reflect local topography and landform.	2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit 1. Poor fit	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage		Not reached this level of detail at this stage			Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage			Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage		Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage
		transport	the scheme on the surrounding environment.	The design of structures will be of lasting architectural quality.	The design of structures will be of lasting architectural quality.	2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this leve of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage	Not reached this level of detail at this stage
			a	The Scheme will avoid or, where absolutely necessary, minimise the direct loss of National Trust land, other reas owned and managed for conservation, open access land and country parks and at the same time minimise intrusion upon such land.	minimise the direct loss of National Trust land, other areas owned and managed for conservation, open access land and country parks and at the same time minimise	2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	2. Low fit	1. Poor fit	1. Poor fit	4. Good fit	4. Good fit	1. Poor fit	3. Reasonable Fit	2. Low fit	4. Good fit	1. Poor fit	1. Poor fit	4. Good fit	4. Good fit	4. Good fit	2. Low fit	2. Low fit	3. Reasonable Fit	2. Low fit	2. Low fit	3. Reasonable Fit
			I	The Scheme will enable enhanced preservation of heritage assets and their settings and adopt designs that reflect and enhance the historic character of the area.	The Scheme will enable enhanced preservation of heritage assets and their settings and adopt designs that reflect and enhance the historic character of the area.	<ol><li>Reasonable fit</li></ol>	3. Reasonable Fit	2. Low fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit
			-	The Scheme will avoid significant interruption to groundwater flows or negative impacts on the aquifer, springs and watercourses.		1. Poor fit 2. Low fit 3. Reasonable fit 4. Good fit 5 Excellent fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	3. Reasonable Fit	3. Reasonable Fit	3. Reasonable Fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit	2. Low fit
	Key uncertainties	relate to govt / strategic objectives / uncertain assumption	text box			text only					Horizontal radii of 270m	Similar to 6A						Similar to Option 21 & alignment runs through Stockwell Farm	Maximum gradient o 5%			Tunnel portal on existing alignment of A417		Similar to Option 24	Similar to Option 25	
D	Degree of consensus over outcomes?	level of consultation			level of consultation	1. Little or no consultation 2 3 4 5 Extensive consultation	n 1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation	1. Little or no consultation							
			What impact does it have on end-to-end journey time?		What impact does it have on end-to-end journey time?	*-3 Largely Adverse* *-2* *-1* 0 Neutral 1 2	Largely beneficial	Slightly beneficial	Slightly beneficial	Largely beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial
		Connectivity	Does it have an impact on the cost of travel (vehicle operating costs, fares, etc.)?		Does it have an impact on the cost of travel (vehicle operating costs, fares, etc.)?	3 Largely beneficial *-3 Largely Adverse* *-2* *-1* 0 Neutral 1 2																				
			Impact on day-to-day variability in journey time or average minutes of lateness?		Impact on day-to-day variability in journey time or average minutes of lateness?	3 Largely beneficial *-3 Largely Adverse* *-2* *-1* 0 Neutral 1 2	Moderately beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial
		Reliability	What will happen to the number of incidents?		What will happen to the number of incidents?	3 Largely beneficial *-3 Largely Adverse* *-2* *-1* 0 Neutral 1 2	Slightly beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Largely beneficial	Largely beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial
	Economic Growth	Resilience	What impact does this option have on the resilience of the network?		What impact does this option have on the resilience of the network?	3 Largely beneficial *-3 Largely Adverse* *-2* *-1* 0 Neutral 1 2	Moderately beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial
		Delivery of Housing	How will this option facilitate new housing?		How will this option facilitate new housing?	3 Largely beneficial *-3 Largely Adverse* *-2* *-1* 0 Neutral 1 2	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial											
		Wider economic impacts			Wider economic impacts	<u>3 Largely beneficial</u> Text																				
		Activity	Does vehicle-km change?		Does vehicle-km change?	*-3 Largely Adverse" (higher vehicle kms) *-2" *-1" 0 Neutral 1 2 3 Largely beneficial (lower	r Moderately beneficial	Slightly adverse	Slightly adverse	Largely beneficial	Slightly beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Slightly beneficial	Largely beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
		Embedded Carbon	Is significant construction work required?		Is significant construction work required?	vehicle kms) Yes or no	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes											
		Carbon content	Does this option involve a lower carbon fuel to be used (carbon per litre)?		Does this option involve a lower carbon fuel to be used (carbon per litre)?	*-3 Largely Adverse* (higher carbon) *-2* *-1* 0 No change 1 2 2 Largely bopolicial (lower	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral											
	Carbon emissions	Efficiency	Does fuel per vehicle-km change?		Does fuel per vehicle-km change?	3 Largely beneficial (lowe carbon) "-3 Largely Adverse" (Increase) "-2" 0 No change 1 2 3 Largely beneficial (Decrease)	Moderately beneficial	Moderately beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial
		Overall effect on Carbon emissions			Overall effect on Carbon emissions	*-3 Largely Adverse* (Increase) *-2* *-1* 0 No change 1 2 3 Largely beneficial (Decrease)	Moderately beneficial	Slightly adverse	Slightly adverse	Largely beneficial	Slightly beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Slightly beneficial	Largely beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
			Does the option have an impact on accessibility/ affordability/ availability/ acceptability for vulnerable groups (low income, disabled, the elderly, etc.)?		Does the option have an impact on accessibility/ affordability/ availability/ acceptability for vulnerable groups (low income, disabled, the elderly, etc.)?	*-3 Largely Adverse" *-2" 0 No change 1 2 3 Largely beneficial																				

and of	ied problems jectives of the	EAST Headings	sub-headings / objectives	sub - objectives	final criteria (ind Engineering and Environmental)	Scoring criteria	6	7	26	3	12	15	30	2	9	13	14	20	21	22	28	1	29	5	23	24
	option		Can it be mitigated against?		Can it be mitigated against?	Yes or no	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Socio	distributional	Regeneration	Does the option have an impact on a targeted		Does the option have an impact on a targeted	"-3 Largely Adverse" "-2" "-1"	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
	regions		regeneration area, if so what is the impact likely to be? If this is a weak region, what		regeneration area, if so what is the impact likely to be? If this is a weak region, what is the impact of the option	1 2 3 Largely beneficial -3 Largely Adverse	Neutral	Neutral	Neutral	Neutral	Neutral		Neutral	Neutral	Neutral	Neutral	Neutral			Neutral	Neutral	Neutral		Neutral	Neutral	Neutral
			is the impact of the option on the region?		on the region?	- 1 0 No change -3 Largely Adverse"	Neutrai	Nedual	weunar	Neutral	weutrai	Neutral	Neutral	Neutral	weunar	Neutrai	Neutrai	Neutral	Neutral	weunar	Neutral	Neutral	Neutral	Neutral	Neutrai	neutar
	ĸ	egional Imbalanci	e How will this impact economic growth?		How will this impact economic growth?	"-2" "-1" 0 No change 1 2 3 Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial
			What impact does the option have on local air quality?		What impact does the option have on local air quality?	"-3 Largely Adverse" "-2" "-1" 0 No change 1 2	Slightly beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Moderately beneficial N	Noderately beneficial	Slightly beneficial	Largely beneficial	Largely beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial
		Air Quality	Is an AQMA affected? If YES: How many households are affected		Is an AOMA affected? If YES: How many households are affected	3 Largely beneficial *-2 Many negative impact* *-1 * 0 1	Few - Positive Impact F	ew - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact	Few - Positive Impact				
Economic			Is an AQMA affected? If NO: Is it likely to create the need for an AQMA?		Is an AQMA affected? If NO: Is it likely to create the need for an AQMA?	2 Many positive impact d Yes or no or N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Noise	Does this option reduce absolute disturbance from noise?		Does this option reduce absolute disturbance from noise?	1 2	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Slightly beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial							
Local	environment		Does it affect a problem area?		Does it affect a problem area?	3 Largely beneficial Yes or no	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Natural environment, heritage and	What is the overall impact on the natural environment?		What is the overall impact on the natural environment?	1 2	Moderately adverse	Moderately adverse	Moderately adverse	Slightly beneficial	Slightly adverse	Moderately adverse	Slightly adverse	Slightly beneficial	Slightly beneficial	Largely adverse	Largely adverse	Largely beneficial	Largely beneficial	Largely beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Moderately adverse	Moderately adverse	Slightly beneficial
		landscape	If negative, what is the value of the environment affected?		If negative, what is the value of the environment affected?	3 Largely beneficial "-1 High" 0 low	High	High	High	High	High	High	High	High	High	High	High	High	High	High	N/A	N/A	N/A	High	High	N/A
	=		What is the overall impact on			"-3 Largely Adverse" "-2" "-1"																				
	u	Streetscape and rban environment	If negative, what is the value		What is the overall impact on the urban environment? If negative, what is the value of the environment	0 No change 1 2 3 Largely beneficial "-1 High"	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
_			of the environment affected?		affected?	0 low "-3 Largely Adverse" -	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Does it increase the possibility of cross street/corridor connections between neighbourhoods		Does it increase the possibility of cross street/corridor connections between neighbourhoods	worsens connectivity across the route "-2" "-1" 0 No Impact 1	Slightly beneficial	Slightly beneficial	Slightly beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Moderately beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Slightly beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
		Severance				<ul> <li><sup>2</sup> S Largely beneficial - overall significant positive impact on connectivity</li> <li>*-3 Largely Adverse* - worsens public realm by increasing traffic through</li> </ul>																				
			Will more or less people be outside the public realm as a result?		Will more or less people be outside the public realm as a result?	communities *-2* 0 No impact 1 2 3 Largely beneficial -	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
	_					significant positive impact on public realm																			[]	
		Physical Activity	What impact does the option have on levels of physical activity		What impact does the option have on levels of physical activity	*3 Largely Adverse* *2* *1* 0 No change 1 2 3 Largely beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
	-		What impact does the option have on the number injured or killed in traffic accidents?		What impact does the option have on the number injured or killed in traffic accidents?	"-3 Largely Adverse" "-2" "-1" d 0 No change 1	Slightly beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial
		Injury or deaths	What impact does the option			2 3 Largely beneficial "-3 Largely Adverse" - increase net risk "-2" "-1"																				
			have on risk of travelling (KSI per km)?		What impact does the option have on risk of travelling (KSI per km)?	1 2 3 Largely beneficial - decrease net risk	Slightly beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial
v	ell being		What impact will this option have on crime?		What impact will this option have on crime?	*-3 Largely Adverse* *-2* *-1* 0 No change 1 2	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
		Crime				3 Largely beneficial "-3 Largely Adverse" "-2"																				
			What impact will it have on people's fear of crime?		What impact will it have on people's fear of crime?	"-1" 0 No change 1 2 3 Largely beneficial -3 Largely Adverse	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
			What impact does it have on end-to-end journey time?		What impact does it have on end-to-end journey time?	"-2" "-1"																				
			Does it have an impact on the			3 Lamoly beneficial "-3 Largely Adverse" "-2" "-1"																				
			cost of travel (vehicle operating costs, fares, etc.)?		Does it have an impact on the cost of travel (vehicle operating costs, fares, etc.)?	0 No change 1 2 3 Largely beneficial *-3 Largely Adverse* -	Moderately beneficial	Slightly adverse	Slightly adverse	Largely beneficial	Slightly beneficial N	Noderately beneficial	Moderately beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Largely beneficial	Slightly beneficial	Largely beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
		njoying access to a range of goods, services, people and places	Does the option improve access to key locations (supermarkets, doctors, hospitals, etc.)?		Does the option improve access to key locations (supermarkets, doctors, hospitals, etc.)?	worsening access "-2" "-1" 0 No change 1 2	Moderately beneficial N	foderately beneficial	Moderately beneficial																	
		proces	Impact on day-to-day variability in journey time or average minutes of lateness?		Impact on day-to-day variability in journey time or average minutes of lateness?	<sup>1</sup> -3 <u>Largely beneficial</u> - <sup>1</sup> -3 Largely Adverse" <sup>1</sup> -2" <sup>1</sup> -1" 0 No change 1 -					Largely beneficial															
						2 3 Laroelv beneficial																				

Identified problem and objectives of t option	ns he EAST Headings	sub-headings / objectives sub - objectives	final criteria (incl Engineering and Environmenta	) Scoring criteria	6	7	26	3	12	15	30	2	9	13	14	20	21	22	28	1	29	5	23	24
		What will happen to the number of incidents?	What will happen to the number of incidents?	*-3 Largely Adverse* (Increase) *-2* *-1* 0 No change 1 2 3 Largely beneficial (Decrease)	Moderately beneficial	Slightly adverse	Slightly adverse	Largely beneficial	Slightly beneficial	Moderately beneficial	Moderately beneficial	Largely beneficial	Slightly beneficial	Largely beneficial	Moderately beneficial	Slightly beneficial	Slightly beneficial	Slightly ben						
Expected VfM Category				(Decrease) 1. Very High >4 2. High 2-4 3. Medium 1.5-2 4. Low 1-1.5 5. Poor <1	2. High 2-4	3. Medium 1.5-2	3. Medium 1.5-2	3. Medium 1.5-2	2. High 2-4	2. High 2-4	2. High 2-4	3. Medium 1.5-2	3. Medium 1.5-2	2. High 2-4	2. High 2-4	4. Low 1-1.5	4. Low 1-1.5	4. Low 1-1.5	3. Medium 1.5-2	3. Medium 1.5-2	3. Medium 1.5-2	3. Medium 1.5-2	3. Medium 1.5-2	3. Medium
Implementation timetable	1			1. 10+ years 2. 5-10 years 3. 2-5 years 4. 1-2 years 5. 6-12 months 6. 1-6 months 7. 0-1 months	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 years	6. 5-10 y
Public acceptabil	ity			1. Low 2. 3. 4. 5. High	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Medium	3. Med
al Practical feasibil	ity			1. Low 2. 3. 4. 5. High	4. Good	2. Slight	2. Slight	4. Good	3. Medium	4. Good	4. Good	3. Medium	4. Good	4. Good	4. Good	3. Medium	4. Good	3. Medium	4. Good	3. Medium	4. Good	3. Medium	3. Medium	4. Goi
What is the quality the supporting evidence?	y of			1. Low level of support 2. 3. 4. 5. High level of support	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reasonable	3. Reaso
Key risks				text	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk register	see risk r
Affordability				1. Not Affordable (>600m) 2. (500-600m) 3. (400 - 500m) 4. (300 - 400m) 5. Affordable (<300m)	4	2	2	1. Not affordable	5. Affordable	5. Affordable	4	3	3	5. Affordable	5. Affordable	1. Not affordable	1. Not affordable	1. Not affordable	2	1. Not affordable	1. Not affordable	2	3	1. Not aff
Capital Cost (Ém	);			1 0-100 2. 100-200 3. 200-300 4. 300-400 5. 400-500 6. 500-600 7. 600-700 8. 700-800 9. 800-900 10. 900+	300-400	500-600	500-600	600-700	200-300	200-300	300-400	500-600	500-600	200-300	200-300	900+	900+	900+	500-600	600-700	600-700	500-600	400-500	600-7
Revenue Costs (£m)?	5		estimate of the maintenance and other costs that wi required for the upkeep	1. None 2. 0-5 3. 5-10 4. 10-25																				
Cost Profile				1. High Risk																				
Overall cost ris				2. 3. 4. 5. Low Risk	3	1. High Risk	1. High Risk	1. High Risk	3	3	3	1. High Risk	1. High Risk	2	2	3	1. High Risk	1. High Risk	1. High Risk	1. High Risk	1. High Risk	1. High Risk	1. High Risk	1. Hig
Other costs			flexibility of changing features of scheme based on l level of funding available	1. Static 2. 3. 4. 5.Dvnamic	3	5. Dynamic	5. Dynamic	4	2	3	3	4	4	3	4	5. Dynamic	4	5. Dynamic	5. Dynamic	2	4	5. Dynamic	5. Dynamic	5. Dyr
Where is fundin coming from?	g		text only																					
Any income generated? (Y/M	If yes, how much			1. None 2. 0-5 3. 5-10 4. 10-25 5. 25-50 6. 50-100 7. 100-250 8. 250-500 9. 500-1000 10. 1000+	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. None	01. 1