

Appraisal Summary Table							Contact:																																																																																									
Name of scheme:		North Tuddenham Option 4					Name																																																																																									
Description of scheme:		A47 North Tuddenham to Easton Dualling					Organisation																																																																																									
							Role	Promoter/Official																																																																																								
Impacts		Summary of key impacts		Assessment																																																																																												
				Quantitative		Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp																																																																																								
Economy	Business users & transport providers	<p>The scheme results in journey time benefits for all road users with a reduction in total time travelled across the network between the Do Minimum and Do Something in both 2021 and 2036 future year scenarios. The greatest journey time savings are for trips that have a journey time of between 2 to 5 minutes but there are still savings for trips greater than 5 mins.</p>		Value of journey time changes(£)			£62.2million																																																																																									
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	£16,219,000			£64,228,000	£8,265,000																																																																																											
	Reliability impact on Business users	<p>The scheme is expected to improve journey time reliability due to increased capacity and network resilience due to proposed A47 dualling increasing road space, better visibility and improved safety.</p>		-		Slight Benefit		-																																																																																								
	Regeneration	<p>The expected journey time benefits are likely to support regeneration along the A47, with associated reductions in unemployment levels.</p>				Slight Benefit		-																																																																																								
	Wider Impacts	Not assessed				N/A		-																																																																																								
Environmental	Noise	<p>There is an overall adverse impact to the noise environment as shown by the negative value of the NPV for change in noise.</p>		<p>Households experiencing increased daytime noise in forecast year: 147 Households experiencing reduced daytime noise in forecast year: 78 Households experiencing increased night time noise in forecast year: 14 Households experiencing reduced night time noise in forecast year: 17</p>		N/A	-£216,603	Moderate adverse for vulnerable groups																																																																																								
	Air Quality	<p>In the opening and assessment years, exceedances of the Air Quality Strategy objective values are not predicted at any sensitive human receptors. Overall, the scheme will lead to an imperceptible improvement in predicted NO₂ concentrations and an imperceptible deterioration in predicted PM₁₀ concentrations across the study area in the opening year, whilst there will be an imperceptible improvement in predicted NO₂ concentrations and an imperceptible improvement in predicted PM₁₀ concentrations across the study area in the operating year. The highest impacts from individual road links are moderate adverse and major benefits.</p> <p>Specific to the assessed scenarios, the results show:</p> <p>Opening Year 2021: A net deterioration in property weighted concentrations of NO₂ and a net deterioration in property weighted concentrations of PM₁₀ between the Do-Something and Do-Minimum scenarios. There is an overall increase in NO_x emissions in both the areas exceeding the limit values and the areas not exceeding the limit values.</p> <p>Operational Year 2036: A net deterioration in property weighted concentrations of NO₂ and net deterioration in property weighted concentrations of PM₁₀ between the Do-Something and Do-Minimum scenarios. There is an overall increase in NO_x emissions in the areas not exceeding the limit values.</p> <p>Overall the impact of the scheme is considered to be minor adverse.</p>		<table><tr><th rowspan="2">Scenario</th><th colspan="3">Properties</th><th rowspan="2">Score</th><th colspan="2">Change in Emissions (t)</th></tr><tr><th>Improvement</th><th>No Change</th><th>Deterioration</th><th>Not exceeding</th><th>Exceeding</th></tr><tr><td>NO₂ 2021</td><td>746</td><td>0</td><td>738</td><td>958.15</td><td></td><td></td></tr><tr><td>PM₁₀ 2021</td><td>441</td><td>0</td><td>3043</td><td>2312.39</td><td></td><td></td></tr><tr><td>NO₂ 2036</td><td></td><td></td><td></td><td></td><td>10.24</td><td>0.7</td></tr><tr><td>NO₂ 2036</td><td>1</td><td>0</td><td>1483</td><td>2875.27</td><td></td><td></td></tr><tr><td>PM₁₀ 2036</td><td>564</td><td>0</td><td>920</td><td>2229.46</td><td></td><td></td></tr><tr><td>NO₂ 2036</td><td></td><td></td><td></td><td></td><td>10.94</td><td>0.00</td></tr></table>		Scenario	Properties			Score	Change in Emissions (t)		Improvement	No Change	Deterioration	Not exceeding	Exceeding	NO ₂ 2021	746	0	738	958.15			PM ₁₀ 2021	441	0	3043	2312.39			NO ₂ 2036					10.24	0.7	NO ₂ 2036	1	0	1483	2875.27			PM ₁₀ 2036	564	0	920	2229.46			NO ₂ 2036					10.94	0.00	<p>Present value of change in NO_x emissions: £-396,967</p> <p>Present value of change in PM₁₀ concentrations: £-6,772,760</p> <p>Total value of change in air quality: £-7,169,727</p> <p>(Positive values indicate a net benefit)</p>	<p>There is an overall beneficial impact for NO₂ effects in the opening year and neutral impacts in the operating year. There is an overall beneficial impact for PM₁₀ in the opening year, and adverse impact in the operating year. Adverse effects are concentrated within the 40-60% quintile which is the lowest income quintile in the study area. Beneficial effects in the 60-80% quintile will have a disproportionate beneficial effect on lower income quintiles.</p> <table><tr><th rowspan="2"></th><th colspan="5">Distributional impact of income deprivation</th></tr><tr><th>0-20%</th><th>20-40%</th><th>40-60%</th><th>60-80%</th><th>80-100%</th></tr><tr><td>NO₂ DS2021</td><td>O</td><td>O</td><td>✓</td><td>✓✓</td><td>O</td></tr><tr><td>NO₂ DS2036</td><td>O</td><td>O</td><td>x</td><td>✓✓</td><td>O</td></tr><tr><td>PM₁₀ DS2021</td><td>O</td><td>O</td><td>xx</td><td>xx</td><td>O</td></tr><tr><td>PM₁₀ DS2036</td><td>O</td><td>O</td><td>x</td><td>✓✓</td><td>O</td></tr></table>		Distributional impact of income deprivation					0-20%	20-40%	40-60%	60-80%	80-100%	NO ₂ DS2021	O	O	✓	✓✓	O	NO ₂ DS2036	O	O	x	✓✓	O	PM ₁₀ DS2021	O	O	xx	xx	O	PM ₁₀ DS2036	O	O	x	✓✓	O
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Greenhouse gases	<p>Emissions of CO₂e are predicted to increase as a result of the scheme over Carbon Budget periods 3 and 4.</p> <p>The change in emissions for the opening year with the scheme in place is an increase of 11,827tCO₂e over the opening year without the scheme in place.</p>		<p>Change in non-traded carbon over 60y (CO2e)</p> <p>185,405</p> <p>Change in traded carbon over 60y (CO2e)</p> <p>0</p>		-	<p>Net Present value of CO₂e emissions of proposal: £-7,375,312</p> <p>(Positive values indicate a net</p>	-																																																																																									
Landscape	<p>Option 4 involves offline dualling to the south of the existing A47 and to the south of the River Tud. It will involve a new crossing of the River Tud in the west of the study area where the river valley is smaller in scale and well wooded. The alignment will also cross woodland to the southwest and southeast of Honingham and smaller fields to the west of Easton. While vegetation will be replaced the impacts of widening on existing landscape fabric and quality will be considerable and may not be entirely mitigated.</p>		N/A		Large adverse		-																																																																																									
Townscape	<p>Option 4 runs 0.5km to the south of Hockering and 0.1km to the south of Honingham. The option will not affect Hockering due to the distance from the village. The mainline will affect the setting of Honingham as it will pass immediately to the south of Honingham Mill and be visible to the southeast of Colton Road. Neutral for Hockering and Moderate for Honingham; overall</p>		N/A		Moderate adverse		-																																																																																									
Historic Environment	<p>Option 4 avoids impacting upon the non designated Honingham Hall and the effects upon the historic landscape, taking into account previous change is likely to be minor. There will be impacts to below ground remains of regional significance. This would also effect the setting of the Grade II listed Berry Hall, to which the icehouse belonged, severing the historical links. It would also impact upon the setting of Grade I All Saints Church. The large adverse effect is due principally to the potential impact of the option upon the Grade II listed icehouse. Should the icehouse be retained then the assessment score would significantly reduce.</p>		N/A		Large adverse		-																																																																																									
Biodiversity	<p>Option 4 avoids impacting CWSs directly and has similar impacts with regard the crossing of the River Tud as the other options. However it requires a significant number of culverts on minor watercourse which flow into the Tud, has significant impact on priority habitat along the Tud valley and has a direct impact on GCN habitat and a direct impact on a known bat roost (Ice House). Overall with mitigation is considered to be moderate adverse.</p>		N/A		Moderate adverse		-																																																																																									
Water Environment	<p>Option 4 will require one new crossing of the River Tud and will further intersect numerous drainage streams. Adverse impacts on surface water quality and biodiversity are likely, particularly during construction. The proposed alignment intercepts the largest area of the groundwater SPZ. During operation, the option crosses flood zone 2 and flood zone 3 and numerous areas at high risk of surface water flooding are also intercepted. The creation of an impermeable dual carriageway through this may lead to an increase in flood risk.</p>		N/A		Moderate adverse		-																																																																																									
Social	Commuting and Other users	<p>The scheme results in journey time benefits for cars with a reduction in total time travelled across the network between the Do Minimum and Do Something in both 2021 and 2036 future year scenarios. The greatest journey time savings are for trips that have a journey time of between 2 to 5 minutes. Benefits are higher in 2036 than in 2021 but there are still savings for trips greater than 5 mins.</p>		Value of journey time changes(£)		£73.2million	-																																																																																									
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			£40,584,000 £65,546,000 £9,275,000		-																																																																																											
	Reliability impact on Commuting and Other users	<p>The CRF is increased significantly due to additional running lanes in each direction and the increased capacity of each lane in one-way traffic. This more than accommodates the trip attraction due to the scheme. Resulting stress levels are below the WebTAG calculation threshold of 75%</p>		<p>Without scheme stress: 115% With scheme stress: 53% AADT: 45,544</p>		Moderate benefit		-																																																																																								
	Physical activity	<p>Beneficial for existing trips to and from Hockering but severs East Tuddenham and Honingham</p>		-		Neutral		-																																																																																								
	Journey quality	<p>Reduction in driver frustration and fear of accidents. Neutral impact on other aspects of journey quality</p>		-		Moderate benefit	-	-																																																																																								
	Accidents	<p>The scheme results show a theoretical decrease in accidents with the new dual carriageway and roundabout junction designed to modern standards and indicate a reduction in overall accidents of all types.</p>		<p>Predicted accident savings: Fatal: 6.86 Serious: 52.64 Slight: 160.79</p>		Moderate benefit	£13.8million	-																																																																																								
	Security	<p>The security impacts have been assessed based upon various security indicators looking at site perimeters, surveillance, landscaping, lighting and visibility and emergency call facilities for road users and NMU's. The assessment shows that the the scheme's security measures do not change from DM and therefore a "neutral" score has been given.</p>		-		Neutral		-																																																																																								
	Access to services	<p>No impacts on user accessibility</p>				Neutral		-																																																																																								
Affordability	<p>Personal affordability is worsened as private user costs are increased, mostly due to an overall increase in non-fuel vehicle operating costs.</p>				Moderate adverse		-																																																																																									
Severance	<p>The scheme has not yet been designed to a level where pedestrian provision has been finalised. However, the severance of the scheme from the proposed alignment is broadly similar to the existing situation</p>				Neutral		-																																																																																									
Option and non-use values	<p>The scheme does not involve the loss or introduction of a new mode of transport. Option values are unaffected.</p>				Neutral		-																																																																																									
Public Accounts	Cost to Broad Transport Budget	<p>Construction costs will be met directly from central government's broad transport budget.</p>					£86.2million	-																																																																																								
	Indirect Tax Revenues	<p>There is a small benefit to wider public finances due to increased fuel use resulting in a net increase in tax revenues.</p>					£21.0million	-																																																																																								