

Appraisal Summary Table							Contact:																																																																																
Name of scheme:		North Tuddenham Option 1					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	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.		Value of journey time changes(£)			£80.5million																																																																																
	Net journey time changes (£)																																																																																						
	0 to 2min			2 to 5min	> 5min																																																																																		
	£16,660,000	£74,761,000	£11,240,000																																																																																				
Reliability impact on Business users	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.		-		Slight Benefit		-																																																																																
Regeneration	The expected journey time benefits are likely to support regeneration along the A47, with associated reductions in unemployment levels.				Slight Benefit		-																																																																																
Wider Impacts	Not assessed				N/A		-																																																																																
Environmental	Noise	There is an overall adverse impact to the noise environment as shown by the negative value of the NPV for change in noise.		Households experiencing increased daytime noise in forecast year: 269 Households experiencing reduced daytime noise in forecast year: 63 Households experiencing increased night time noise in forecast year: 39 Households experiencing reduced night time noise in forecast year: 18		N/A	-£649,355	Moderate adverse for vulnerable groups																																																																															
	Air Quality	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 deterioration in NO ₂ concentrations and an imperceptible deterioration in PM ₁₀ concentrations across the study area. Specific to the assessed scenarios, the results show: Opening Year 2021: A net deterioration in property weighted concentrations of NO ₂ and a net improvement in property weighted concentrations of PM ₁₀ 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. Operational Year 2036: A net deterioration in property weighted concentrations of NO ₂ and a net improvement in property weighted concentrations of PM ₁₀ 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. Overall the impact of the scheme is considered to be minor adverse.		<table><tr><th rowspan="2">Scenario</th><th colspan="3">Properties</th><th rowspan="2">Score</th><th rowspan="2">Emissions (Tonnes)</th></tr><tr><th>Improvement</th><th>No Change</th><th>Deterioration</th></tr><tr><td>NO₂ 2021</td><td>273</td><td>94</td><td>998</td><td>113.19</td><td></td></tr><tr><td>PM₁₀ 2021</td><td>358</td><td>0</td><td>1008</td><td>359.86</td><td></td></tr><tr><td>NO₂ 2036</td><td>39</td><td>0</td><td>1326</td><td>2006.63</td><td></td></tr><tr><td>PM₁₀ 2036</td><td>334</td><td>0</td><td>1031</td><td>370.03</td><td></td></tr><tr><td>NO₂ 2021</td><td></td><td></td><td></td><td></td><td>+11.22</td></tr><tr><td>NO₂ 2036</td><td></td><td></td><td></td><td></td><td>+10.33</td></tr></table>		Scenario	Properties			Score	Emissions (Tonnes)	Improvement	No Change	Deterioration	NO ₂ 2021	273	94	998	113.19		PM ₁₀ 2021	358	0	1008	359.86		NO ₂ 2036	39	0	1326	2006.63		PM ₁₀ 2036	334	0	1031	370.03		NO ₂ 2021					+11.22	NO ₂ 2036					+10.33	Present value of change in NO _x emissions: £-383,236 Present value of change in PM ₁₀ concentrations: £-1,111,176 Total value of change in air quality: £-1,494,411 (Positive values indicate a net benefit)	There is an overall adverse impact in all scenarios. Adverse effects are concentrated within the 60-80% quintile, however the large adverse magnitude of of these effects can increase the adverse effects on the lower income groups within the study area. <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>0</td><td>0</td><td>x</td><td>xxx</td><td>x</td></tr><tr><td>NO₂ DS2036</td><td>0</td><td>0</td><td>✓</td><td>xxx</td><td>x</td></tr><tr><td>PM₁₀ DS2021</td><td>0</td><td>0</td><td>xx</td><td>xx</td><td>x</td></tr><tr><td>PM₁₀ DS2036</td><td>0</td><td>0</td><td>x</td><td>xxx</td><td>x</td></tr></table>		Distributional impact of income deprivation					0-20%	20-40%	40-60%	60-80%	80-100%	NO ₂ DS2021	0	0	x	xxx	x	NO ₂ DS2036	0	0	✓	xxx	x	PM ₁₀ DS2021	0	0	xx	xx	x	PM ₁₀ DS2036	0	0	x	xxx	x
	Scenario	Properties			Score		Emissions (Tonnes)																																																																																
Improvement		No Change	Deterioration																																																																																				
NO ₂ 2021	273	94	998	113.19																																																																																			
PM ₁₀ 2021	358	0	1008	359.86																																																																																			
NO ₂ 2036	39	0	1326	2006.63																																																																																			
PM ₁₀ 2036	334	0	1031	370.03																																																																																			
NO ₂ 2021					+11.22																																																																																		
NO ₂ 2036					+10.33																																																																																		
	Distributional impact of income deprivation																																																																																						
	0-20%	20-40%	40-60%	60-80%	80-100%																																																																																		
NO ₂ DS2021	0	0	x	xxx	x																																																																																		
NO ₂ DS2036	0	0	✓	xxx	x																																																																																		
PM ₁₀ DS2021	0	0	xx	xx	x																																																																																		
PM ₁₀ DS2036	0	0	x	xxx	x																																																																																		
Greenhouse gases	Emissions of CO ₂ e are predicted to increase as a result of the scheme over Carbon Budget periods 3 and 4. The change in emissions for the opening year with the scheme in place is an increase of 12.973tCO ₂ e over the opening year without the scheme in place.		Change in non-traded carbon over 60y (CO2e)		203,502	-	Net Present value of CO ₂ e emissions of proposal: £-8,095,241 (Positive values indicate a net																																																																																
			Change in traded carbon over 60y (CO2e)		0																																																																																		
Landscape	The option will introduce large scale infrastructure into an area where currently it is absent. The new mainline will have strong influence on landscape charcater due to it being a linear feature crossing field boundaries and resulting in the loss of hedges, woodland and ponds. The crossing of the River Tud valley in the east of the study area is a substantial change in a limited		N/A			Large adverse		-																																																																															
Townscape	The Option runs across the route of Heath Road in Hockering close to properties in the north of the village. It will therefore change the character of Heath Road and the northern fringe of the village by introducing a large linear feature in addition to the noise and movement of traffic using the new road. The new mainline will sever two PRoW that provide access to Hockering Wood from the village. The new mainline will pass close to St Michael's Church which is visible from the western PRoW and will be seen in the context of the village.		N/A			Large adverse		-																																																																															
Historic Environment	Option 1 will impact upon the remains of medieval settlement, which survives as upstanding earthworks altering their overall form. It will also cut a site of Roman settlement, of medium value, as well as other archaeological features of local value. The construction of the main carriageway will sever the non designated historic parkland, Honingham Park, including key landscape features and result in the demolition of its walled garden. It will also impact upon the relationship of the parkland with the adjacent Grade II* St Andrew's Church; the park laid out with the church forming a key landscape feature.		N/A			Large adverse		-																																																																															
Biodiversity	Significant direct impact on Church Meadow, Alder Carr, Three Corner Thicket and Nursery Plantation pCWS and further direct impacts on Park Grove CWS, Old Covert and Wood Lane CWS. These contain elements of ancient woodland the loss of which is irreversible and not possible to mitigate. Option 1 also directly impacts one pond with confirmed GCN population whcih could be part of a larger metapopulation related to Hockering Wood SSSI. There will also be slight adverse effects on bats/bat roosts and Bullhead and White-clawed Crayfish which are qualifying features of the River Wensum SAC.		N/A			Moderate adverse		-																																																																															
Water Environment	Option 1 will require one new crossings of the River Tud and will also intersect approximately six drainage streams and six ponds. This will likely result in adverse impacts for surface water and aquatic ecology, particularly during construction. The alignment intercepts the groundwater SPZ while also running through the groundwater NVZ. During operation, the option runs through areas designated as flood zone 3, and also intersects one area classified as flood zone 2 and numerous ponds where the risk of surface water flooding is high.		N/A			Moderate adverse		-																																																																															
Social	Commuting and Other users	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 2 mins.		Value of journey time changes(£)		-	£101.5million	-																																																																															
				Net journey time changes (£)				-																																																																															
		0 to 2min	2 to 5min	> 5min	-																																																																																		
	£37,981,000	£82,335,000	£11,891,000	-																																																																																			
	Reliability impact on Commuting and Other users	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%		Without scheme stress: 115% With scheme stress: 57% AADT: 49,007		Moderate benefit		-																																																																															
	Physical activity	Re-alignment means travel between adjacent settlements does not require crossing A47				Slight Beneficial		-																																																																															
	Journey quality	Reduction in driver frustration and fear of accidents. Neutral impact on other aspects of journey quality		-		Moderate benefit	-	-																																																																															
	Accidents	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.		Predicted accident savings: Fatal: 7.00 Serious: 53.60 Slight: 192.40		Moderate benefit	£14.1million	-																																																																															
	Security	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.				Neutral		-																																																																															
	Access to services	No impacts on user accessibility				Neutral		-																																																																															
Affordability	Personal affordability is worsened as private user costs are increased, mostly due to an overall increase in non-fuel vehicle operating costs.				Moderate adverse		-																																																																																
Severance	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				Neutral		-																																																																																
Option and non-use values	The scheme does not involve the loss or introduction of a new mode of transport. Option values are unaffected.				Neutral		-																																																																																
Public Accounts	Cost to Broad Transport Budget	Construction costs will be met directly from central government's broad transport budget.					£99.2million	-																																																																															
	Indirect Tax Revenues	There is a small benefit to wider public finances due to increased fuel use resulting in a net increase in tax revenues.					£20.7million	-																																																																															