Appraisal Summary Table

Date produced:	April 19	**Contact:**	
Name of scheme:	A1(M) Junction 6 to 8	**Name**	
Description of scheme:	The A1(M) Smart Motorway (the Proposed Scheme) is an improvement scheme, which would upgrade the existing A1(M) between junction 6 and 8 to a smart motorway, with active traffic management (ATM) techniques to increase capacity using variable speed limits and by the permanent conversion of the existing hard shoulder into an extra running lane. The Proposed Scheme is approximately 16.7km long . The Proposed Scheme would provide three permanent running lanes, by converting the hard shoulder into a running lane (lane1), between junction 6 and 8. Through junction running will be provided at junction 6 (northbound only) and junctions 7 and 8. The ALR will be supported through the installation of technology to monitor conditions and inform drivers. A full description of the Proposed Scheme is provided in Chapter 2: The Proposed Scheme, with a summary below: • 30 overhead gantries (including 28 new gantries, 2 retained gantries where existing foundations would be reused). 5 of the new gantries will be fitted with advanced motorway indicators, and all 28 will include variable messaging signs. These will display variable speed limits based on traffic conditions. • 12 emergency areas, 2 places of relative safety and 4 new short sections of hard shoulder will be installed, 6 Emergency Areas, 1 place of relative safety and 2 new short sections of hard shoulder on the northbound carriageway and 6 emergency areas, 1 place of relative safety and 2 new short sections of hard shoulder on the southbound carriageway. They will be constructed to provide a safe area for vehicles to stop in an emergency without interrupting the flow of traffic. • Cameras and loop detectors will provide information to support the technology, where through junction running will be introduced. • Hardening of the central reserve and installation of a reinforced concrete barrier along the majority of the Proposed Scheme between junction 6 and 8 (excluding a section of soft verge that has been proposed north of junction 7).	**Organisation**	
		Role	Promoter/Official

	Impacts	Summary of key impacts	Assessment: Quantitative	Assessment: Qualitative	Assessment: Monetary £(NPV)	Assessment: Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	The main source of benefits relate to travel time savings along the corridor. The A1(M) between J6 and J8 is a D2M currently operating at capacity in the morning peak southbound and evening peak northbound. There are delays at J7 southbound and J6 northbound at the merges. These delays encourage other vehicles to use other routes such as the B197 through Knebworth and the B656 through Codicote.These conditions will worsen into the future Do Minumum scenario. Therefore, with the introduction of the A1(M) SMP scheme these delays at junction 7 southbound and J6 northbound are reduced and there is traffic reduction on the local roads which provides local benefits. Time benefits to business users total £166.312m There are also £8.919m operating cost benefits and £0.673m user charge benefits. These are partly offset by £20.039m increased cost during construction for business users and transport providers.	Value of journey time changes(£m): Net journey time changes (£m): 0 to 2min: £115.954; 2 to 5min: £48.333; > 5min: £2.026		£155,866,000	
	Reliability impact on Business users	As above the scheme provides relief along the corridor. With the provision of the additional lane this reduces the potential impact of incidents along the corridor		n/a	£20,704,237	
	Regeneration	Not assessed at this stage		n/a		
	Wider Impacts	Not assessed at this stage		n/a		
Environmental	Noise	There are 5,063 residential dwellings, with an estimated population of 11,645, and 70 other sensitive receptors within the Calculation Area. Significant beneficial effects during the daytime and night-time are anticipated from operational noise due to 5 new noise barriers and a new low noise road surface on all three lanes in both the Do Something Opening Year, Do Something and Do Minimum Design Year. Non-significant adverse effects are anticipated during the construction phase with the inclusion of specific control measures identified in the Outline Environmental Management Plan that will be implemented by the Delivery Partner. No significant adverse effects have been predicted at non-residential receptors.	Households experiencing increased daytime noise in forecast year: 398 Households experiencing reduced daytime noise in forecast year: 460 Households experiencing increased night time noise in forecast year: 17 Households experiencing reduced night time noise in forecast year: 688	n/a	£4,937,471	Quintiles: 0-20%: Neutral 20-40%: Moderate Beneficial 40-60%: Slight Beneficial 60-80%: Large Beneficial 80-100%: Moderate Beneficial
	Air Quality	Overall there is a net worsening in air quality, an increase in regional NOx emissions, and a reduction in regional PM10 emissions. There are no PCM links exceeding the limit value. The scheme does not result in any limit value exceedances or worsen any existing exceedances. Uncertainties include: no forecast of traffic growth beyond 2037, beyond this no change has been assumed; no forecast emission factors after 2030. From 2030 it has been assumed that 2030 emission factors apply up to 2081.	Assessment Score (2022) PM10: 30.38 NO2: 247.42 Assessment Score (2037) PM10: 31.1 NO2: 149.02	n/a	Change in NPV NOx : -£1,414,294 Change in NPV PM10: £271,904 Change in Total NPV: -£1,142,390	NO2 2022: 0-20% - **XX** 20-40% - **XX** 40-60% - **XXX** 60-80% - **XXX** 80-100% - ✓
	Greenhouse gases	The appraisal reflects a net increase in vehicle emissions. The impact is a small fraction of the total and reflects the different responses in vehicle pollutant emissions to changes in speed. Uncertainties include: no forecast of traffic growth beyond 2037, beyond this no change has been assumed; no forecast emission factors after 2030. From 2030 it has been assumed that 2030 emission factors apply up to 2081. There is no account of CO2 emissions from power generating sources for electric vehicles.	Change in non-traded carbon over 60y (CO2e): 79,285 Change in traded carbon over 60y (CO2e): 0	n/a	-£3,596,684	
	Landscape	The introduction of new elements of infrastructure within the existing motorway corridor, including the construction of emergency areas and associated vegetation loss is not anticipated to substantially modify aspects of the landscape, such as pattern and tranquility that have been identified as being of importance at a local level. Slight adverse impacts are predicted on cultural aspects of the landscape, around Knebworth Park but would be highly localised. Avoidance of significant visual effects on adjacent settlements and rights of way with an awareness of the motorway corridor through careful positioning of infrastructure and relocation where appropriate (gantry location G09 moved north). Replacement of planting removed for construction in combination with additional planting areas will in the medium to long term reduce the awareness of limited change occuring within the corridor, supporting existing landcover patterns generally and in particular at Nimmings Wood. The introduction of the infrastructure into the existing A1(M) corridor is not considered to give rise to a significant adverse effect on landscape character.	n/a	Slight Adverse	n/a	
	Townscape	The incorporation of the new elements would require the localised removal of existing roadside vegetation, however given the short duration of the construction period and replacement planting it would not give rise to significant effects in the medium to long term. Whilst some areas may be subject to localised impacts, and would taller equipment would impact on the views of a small number of visual receptors where the corridor passes through and adjacent to settlements (Oaklands and Welwyn), the resulting effect is not anticipated to be significant.	n/a	Slight Adverse	n/a	
	Historic Environment	The works would temporary slight adverse effects on two Registered Parks and Gardens during construction and during operation (Grade II* Knebworth (NHLE 100255) and Grade II Homewood (NHLE 1000911)). There would be temporary slight adverse effects on one Scheduled Monument (Dicket Mead Roman Villa (NHLE 1015580)) and two Listed Buildings (Grade II* Listed Building The Dairy, the Old Farmhouse and the Tudor House at Stebbing Farm, Grade II Listed Building Thatched Cottage (NHLE 1347466), during construction and Neutral effects in operation.	The total number of assets to be impacted is 5.	Slight Adverse	n/a	
	Biodiversity	The Proposed Scheme will not have a significant effect on any internatonally designated site, however there may be some minor impacts on nationally designated site Knebworth Woods (SSSI). An increase in traffic related nitrogen deposition is an identified impact-effect pathway that will effect the Watery Grove area of Knebworth Woods SSSI, but will not have a significant effect on the SSSI overall. Temporary and permanant habitat removal of some Priority Habitats within the soft estate is expected. Great crested newts are present and breeding within waterbodies in habitats adjacent to the A1(M), particularly in Watery Grove (Knebworth Woods SSSI).	n/a		n/a	
	Water Environment	No works are proposed within fluvial flood risk areas classified as Flood Zone 2 and 3. The works are not predicted to pose increased flood risk to the carriageway or to people and property elsewhere. Surface water discharge will not exceed current discharge rates and new flow control measures will be installed where required. No works are proposed within watercourse channels or to existing culverts and bridges. Works will be required in areas classified as a groundwater source protection zone, although groundwater is estimated to be over 20m below ground level and risks during construction considered negligible with the implementation of appropriate construction environmental management measures. Traffic flow data indicates that the volume of traffic flow attributable to the A1(M) will change more than 20%. HAWRAT assessments have been completed where appropriate. Whilst these indicate a potential risk to the quality of the underlying aquifer the increase in risk is negligible when compared to the baseline scenario. Similarly there is negligible impact to surface water features when compared to the baseline.	n/a	Neutral	n/a	
Social	Commuting and Other users	The main source of benefits relate to travel time savings along the corridor. The A1(M) between J6 and J8 is a D2M currently operating at capacity in the morning peak southbound and evening peak northbound. There are delays at J7 southbound and J6 northbound at the merges. These delays encourage other vehicles to use other routes such as the B197 through Knebworth and the B656 through Codicote.These conditions will worsen into the future Do Minumum scenario. Therefore, with the introduction of the A1(M) SMP scheme these delays at junction 7 southbound and J6 northbound are reduced and there is traffic reduction on the local roads which provides local benefits. The scheme results in £202.138m time saving benefits to commuting and other users and £0.510m user charge benefits. These are offset by £37.583m disbenefit to vehicle operating costs and £25.638m disbenefit during construction for commuting and other users.	Value of journey time changes(£m): Net journey time changes (£m): 0 to 2min: £132.194; 2 to 5min: £69.229; > 5min: £0.715		£139,427,000	
	Reliability impact on Commuting and Other users	As above the scheme provides relief along the corridor. With the provision of the additional lane this reduces the potential impact of incidents along the corridor			£17,462,631	
	Physical activity					
	Journey quality					
	Accidents	The A1(M) scheme provides accident benefits in the local area. The assessment assumes that the accident rate on the scheme is the same as the DM in line with SMP guidance. While there are disbenefits caused by increased traffic elsewhere on the A1 corridor, these are offset by benefits on local roads as traffic is attracted to the A1(M). The scheme results in a net reduction in accidents and thus provides accident benefits			£5,051,600	
	Security	TAG guidance A4.1 notes that social impacts (in personal security terms) might result from changes to the transport system. Adopting the screening criteria in TAG A4.2 indicates that this scheme will not have an impact on personal security. Accordingly this aspect has been excluded from the appraisal		Neutral		
	Access to services	TAG units A4.1 and A4.2 examine accessibility impacts. The TPG guidance for road schemes advises that they should never have anything other than a negligible impact on accessibility. Accordingly this aspect has been excluded from the appraisal.		Neutral		
	Affordability	The scheme results in an increase in operating costs for commuting and other trips which affects all income groups. The impact is included in the TUBA asessment of benefits.		Adverse		
	Severance	TAG Unit (A4.1) indicates that the impact on severance is dependent on whether the scheme has an impact on pedestrian movements, i.e. whether the infrastructure presents a physical barrier to pedestrian movement. Given that the scheme is upgrading the existing corridor and existing crossing facilities are maintained, it is not expected that the A1M(J6-8 scheme will provide a barrier to pedestrian movements, either physically or by increasing traffic (compared 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. Accordingly option values are unaffected.		Neutral		
Public Accounts	Cost to Broad Transport Budget	The cost is based on the preliminary design cost supplied by Highways England in March 2019. In addition, the costs take account of changes in revenue (such as the London congestion charge and tolls			£191,690,000	
	Indirect Tax Revenues				-£29,801,000	