Appraisal Summary Table

Date produced:	26	8	2022

Contact:	
Name	
Organisation	Wiltshire Council
Role	Promoter/Official

Name of scheme:	M4 Junction 17 - Major Road Network improvement scheme
Description of scheme:	The scheme provides enhanced junction capacity and signalisation in order to address increasing congestion, delays and poor reliability. This c.£21.8m investment (present value cost) forms part of a wider package of proposed transport investments on the northern section of the A350 corridor. M4 J17 provides the vital link between the motorway network and the A350 connecting the towns in west Wiltshire, including Chippenham, Melksham and Trowbridge; it provides a link to Malmesbury and the A429 in the north, and also allows for local access via the B4122. The scheme supports strategic objectives to improve north-south connectivity in the Western Gateway region and to tackle lower productivity and declining economic competitiveness in the Wiltshire area. Furthermore, it will help to ensure that the transport network is able to cater for planned and future housing and jobs growth, particularly within the A350 Growth Zone.

Impacts		Summary of key impacts	Assessment					
			Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Using TUBA, TEE estimates the impact on transport user and providers. The scheme implemenatation will result in savings in journey time with savings in vehicle operating costs as well.In this case, 45% of total user benefits accrue to business users and providers.	Value of journey time changes(£) £21.8m Net journey time changes (£) 0 to 2min: £7.1m; 2 to 5min: £12.9m; > 5min: £1.9m			N/A	£21.8m	Moderate Beneficial
	Reliability impact on Business users	Due to scheme implementation, the average journey time for each origin/destination pair has changed considering demand and distance between each pair. The reduced variability in journey time has transformed into the monetised benefit. Out of the total reliability benefits, 35% accrue to the Business users.				N/A	£0.9m	
	Regeneration	The M4 Junction 17 scheme will enhance the performance of the complimentary A350 Melksham Bypass and Chippenham Gateway schemes, helping contribute to the regeneration of Wilthsire and the wider Western Gateway region. Effective connections to the M4 SRN are an important factor in the viability of new housing and employment sites within the area. Chippenham has been identified as a key growth area; its convenient access to the M4 (via Junction 17) is a particular strength in terms of attractiveness in the housing market.				Moderate Beneficial		
	Wider Impacts	The M4 Junction 17 scheme is expected to generate positive wider economic impacts, by reducing journey times for business trips, freight and commuters. This will bring down costs to businesses enabling increased competitiveness, greater agglomeration impacts and provide access to a wider labour market enabling increased productivity. Individuals will also benefit from access to jobs which are better paid or more suited to their individual requirements. The improved capacity of the junction may help to enable increased levels of development as the network becomes more congested in the future, but the scheme does not directly enable any currently planned development.				Moderate Beneficial		
Environmental	Noise	Noise changes due to the Scheme at most noise-sensitive receptors within the operational study area are predicted to be negligible over the short during day and night-time periods. Over the long-term, changes in road traffic noise are expected to be negligible at all receptors during day and night-time periods. Seventy-one receptors are expected to have a minor beneficial impact due to the Scheme over the short-term. These minor beneficial impacts are due to traffic re-routing brought about by increased capacity at M4 J17. When the long-term noise changes are considered, these minor beneficial impacts are expected to be negligible. The findings of a TAG noise appraisal for the Scheme indicate a positive net benefit in terms of health effects due to the	Opening year: 44 negligible increases 144 negligible decreases 71 minor decreases Design year: 179 negligible increases 80 negligible decreases			N/A	£0.2m	Slight Beneficial
	Air Quality	The proposed scheme is not within an AQMA, or likely to affect any AQMAs. There are no links within the DEFRA model in the vicinity of the Scheme and there is no risk of non-compliance with the NO2 limit value. There are 6 properties within 200 m of the Scheme. Reviewing the reliable traffic model area reveals that the change in air quality emissions as a result of the Scheme will be small with an increase of less than 0.05% of DM emissions.	Change in emissions over 60 year period (tonnes): NOx: +18 t PM10: +8 t			N/A	-£0.3 m	Slight Adverse
	Greenhouse gases	Review of reliable traffic model area reveals that the change in greenhouse gas emissions as a result of the Scheme will be an overall increase. The increase is a result of vehicles diverting away from smaller roads to major A roads and motorways resulting in an increase in vehicle km travelled and higher emissions from vehicles travelling on faster roads.	Change in non-traded carbon over 60y (CO2e) +33,286 t Change in traded carbon over 60y (CO2e) +557 t			N/A	-£2.5m	
	Landscape	It is assumed that the proposed scheme will have a slight adverse impact on the landscape due to the vegetation removal required and throughout the construction phase. Impacts will be reduced once mitigation and enhancement measures have been established.				Slight Adverse		
	Townscape	It is assumed that the proposed scheme will have a no impact on the townscape due to the scheme not being in the vicinity.				Neutral		
	Historic Environment	The construction of M4 Junction 17 would result in no permanent moderate adverse impacts on heritage assets in the vicinity of the junction. The improvements to the junction would result in no adverse impacts due to these works being carried out on existing junction and roads where any archaeological remains have already been identified by survey works or truncated/disturbed by previous construction activity. The operation of the option would result in no adverse impacts on the settings of designated heritage assets.				Neutral		
	Biodiversity	The overall assessment score is slight adverse due to the loss of a small area of non-priority habitat which has low biodiversity and earth heritage value, but has potential for protected species. The poor quality of this habitat means that the loss of the habitat would give a 'Neutral' score. However, it is also possible that future surveys may identify populations of protected species (nesting birds, bats, reptiles, hazel dormouse, badger or great crested newt), Which could change the receptor value to 'Medium' or 'High'. As long as appropriate mitigation is provided, this would still result in an overall score of 'Slightly adverse'.				Slight Adverse		
	Water Environment	The M4 Junction 17 Improvements Scheme will result in an increase in impermeable road area. This could potentially impact the water quality of Rodbourne Brook, Sutton Benger Brook and two unnamed watercourses and/or the underlying aquifer's water quality (depending on where road drainage is discharged to). There is also potential for the increase in impermeable road area to cause an increase in flood risk as a result of an increase in surface water runoff. Sustainable drainage measures that attenuate runoff volumes could be implemented to mitigate an increase in surface water flood risk or fluvial flood risk associated with more water entering a watercourse. There is the possibility that the road widening could encroach into Flood Zones 2 and 3. If this were the case then floodplain storage compensation would be required. Also potential modifications to an existing culvert could potentially impact the hydromorphology of Rodbourne Brook and increase flood risk by causing flow constrictions at times of flooding. Potential impacts on hydromorphology could be mitigated by following environmentally sensitive culvert design standards, including the potential for enhancements up and downstream where practical. As there is a potential impact which is highly significant the overall assessment score for the operation of the M4 Junction 17 Improvements Scheme is large adverse. However, applying water quality and flood risk mitigation will reduce the significance of effect to neutral.				Neutral		
Social	Commuting and Other users	Using TUBA, TEE estimates the impact on transport user and providers. The scheme implemenatation will result in savings in journey time with savings in vehicle operating costs as well. The remaining 55% total user benefits accrue to users with Commuting and Other purposes.	Value of journey time changes(£) £31.8m Net journey time changes (£) 0 to 2min: £11.9m; 2 to 5min: £18.6m; > 5min: £1.2m			N/A	£31.8m	Moderate Beneficial
	Reliability impact on Commuting and Other users	Due to scheme implementation, the average journey time for each origin/destination pair has changed considering demand and distance between each pair. The reduced variability in journey time has transformed into the monetised benefit. The remining 65% accrue to users with Commuting and Other purposes.				N/A	£1.7m	
	Physical activity	Improved signing for cyclists will direct them to use the designated quiet route, making the journey safter and more pleasant, so encouraging greater use of cycling to cross the M4 corridor.				Neutral		
	Journey quality	Reduced levels of congestion at M4 Junction 17 will result in a less frustrating journey				Slight Beneficial		
	Accidents	The monetised cost of accidents is lower in the DS scenario than the DS scenario, which means that the scheme provides an accident dis-benefit. This is due to increases in trips in the DS scenario which has resulted in an increase in vehicle-kilometres and does not suggest any negative safety impact from the network itself.				N/A	£2.2m	Neutral
	Security	The appraisal has resulted in a neutral assessment for most security indicators. The landscape/lighting improvements are assumed to positively impact the level of security for transport users to some extent.				Neutral		
	Access to services	Journey time improvements and traffic relief are expected to bring user benefits and, consequently, to change the cost of travel. Some people may experience disbenefits, for example through longer journey times. The improvements at M4 Junction 17 would lead to wider travel horizons for residents of some nearby areas, improving access to leisure, employment, and education opportunities.				Slight Beneficial		
	Affordability	Small savings in costs of travel related to vehicle operating costs will be achieved by improving efficiency of the junction				Slight Beneficial		Slight Beneficial
	Severance	Reduced journey times will improve access to services. Impacts on public transport services will be limited.				Slight Beneficial		Neutral
	Option and non-use values	N/A				No Assessment Required		
Public Accounts	Cost to Broad Transport Budget	Construction, maintenance and whole life costs have been considered, includsive of inflation and optimsim bias				N/A	£21.8m	
	Indirect Tax Revenues	Savings in vehicle operating costs will result in a small reduction in indirect tax revenue generated due to the high rates of tax on this type of expenditure				N/A	-£0.7m	