Table 2.1: Appraisal Summary Table

Appraisal Summary Table	Date produced:	October 2020	Contact:	
Name of scheme:	A122 Lower Thames Crossing. This AST presents the central case appraisal based on Core traffic growth, Most Likely CAPEX costs and a 2027 project opening year		**Name**	Matt Palmer
Description of scheme:	The A122 Lower Thames Crossing would be a new all-purpose trunk road connecting to the A2 and M2 in Kent, east of Gravesend, crossing under the River Thames through two bored tunnels. To the north of the River Thames, the Project would link to the A13 and join the M25 south of junction 29 and include widening between M25 junctions 28 and 29. It would be 23km long of which 4.25km would be in tunnel. It would be dual 3 lanes, except dual 2 lanes soutbound between the M25 and A13/A1089. Users of the road would be charged in line with charges at Dartford. The new road would have emergency areas and additional vehicle restrictions imposed and managed through signage so that motorway traffic only would be permitted to use the road.		**Organisation**	Highways England
			Role	Executive Director

Impacts		Summary of key impacts	Assessment					
			Quantitative				Qualitative	Monetary £ (NPV)	Distributional 7 point scale / vulnerable group
Economy	Business users & transport providers	Journey time and vehicle operating cost savings for business travellers and freight arise due to reduced congestion and improved connectivity. Small user charge disbenefits are due to additional or rerouted cross river journeys which incur charges on both the new and existing crossings.	Value of journey time changes (£)	£997m			N/A	£1,253m	
			Net journey time changes (£)						
			0 to 2 min	2 to 5 min	> 5 min				
			-£41m	£211m	£826m				
	Reliability impact on Business users	The Project would improve journey time reliability for journeys across the River Thames and on the wider road network by providing an alternative route which would reduce the impact of incidents, reduce the variability of travel times and minimise diversions on local roads.	N/A				N/A	£241m	
	Regeneration	Not appraised because this impact is no longer part of DfT's transport analysis guidance (TAG).	N/A				N/A	N/A	
	Wider Impacts	The Project would effectively reduce perceived distances between businesses, boosting their productivity and economic output and would increase tax revenues as workers supply more labour.	Agglomeration	£1,458m			N/A	£1,657m	
			Output in imperfectly competitive markets	£133m					
			Labour supply impacts	£66m					
Environmental	Noise	Adverse changes in road traffic noise level would occur within approximately 600 metres of the new route alignment, with minor adverse increases along the existing A228. There are predicted to be two dwellings which would qualify under the Noise Insulation Regulations. Minor decreases in road traffic noise level would occur at noise sensitive receptors located along the M25 south of the Project junction with the M25. Overall, there is a net adverse impact of the Project on residential noise levels. The distribution of noise against income quintiles is assessed as uneven. Adverse noise impacts are higher than expected in the most deprived (20%) income quintile groups. There are more net increases in noise greater than 1dB in areas with higher than average proportions of children under 16, compared with both the regional study area and with England and Wales. There are more net increases in noise greater than 1dB in areas with higher than average proportions of people aged 70 and over, compared with both the regional study area and with England and Wales. The impact upon schools and care homes within the study area is predicted to be Neutral.	For the 2042 forecast year: Households with increased day time noise 8,761 Households with reduced day time noise 5,711 Households with increased night time noise 3,693 Households with reduced night time noise 3,830				N/A	£0m	Income: Large Adverse Children: Large Adverse Adults aged 70 and over: Large Adverse

Impacts	Summary of key impacts	Assessment			
		Quantitative		Qualitative	Monetary £ (NPV)	Distributional 7 point scale / vulnerable group
Air Quality	There is an increase in NO_2 and $PM_{2.5}$ concentrations with the Project which are likely to be attributable to an increase in traffic and vehicle kilometers travelled. There is however an overall improvement in air quality at receptors which are predicted to exceed the AQS Objectives for NO_2 in the Project opening year. This is as a result of traffic rerouting to use the Project and would therefore lead to improvements in air quality at Dartford. There are no exceedances of the PM_{10} or $PM_{2.5}$ AQS Objectives in the Project Opening year. There is a reduction in NO_2 and $PM_{2.5}$ between the opening and design year reflecting the improvement in vehicle emissions. Emissions for 2030 have been used for the design year as these are the latest emission factors available. As such this is likely to lead to an overprediction of emissions, as beyond 2030 vehicle emissions would be cleaner with the introduction of ultra low emissions vehicles, such as electric vehicles. Overall, there is a net beneficial impact of the Project on air quality. The distribution of air quality against income quintiles is assessed as uneven as the two most deprived income quintiles benefit, but less than the other income quintiles. There is a net decrease in NO_2 in areas with higher than average proportions of children under 16, compared with both the Regional study area and with England and Wales. No schools would experience a change in air quality levels resulting in an assessment score of Neutral.	Impact Pathway Approach - Concentrations: NO_2 +28,801 tonnes $PM_{2.5}$ +42,402 tonnes		N/A	-£6m	Income: Slight Beneficial Children: Slight Beneficial
Greenhouse gases	The Project is forecast to result in an increase in carbon emissions due to an increase in vehicle kilometres travelled on the road network.	Change in non-traded carbon over 60y (CO_2e) 2.76m tonnes Change in traded carbon over 60y (CO_2e) 0m tonnes Change in CO_2e emissions in 2027 (project opening year): Non-traded carbon: 36,072 tonnes Traded carbon: 0 tonnes		N/A	-£122m	
Landscape	The Project with mitigation would result in major change to the landscape pattern and landcover within the Kent Downs Area of Outstanding Natural Beauty (AONB) and its setting and elsewhere within Green Belt. The new road infrastructure and vehicle movements would create a series of additional new elements impacting directly and indirectly on national, regional and locally valued features including areas of relative tranquillity, designated features, field bounding hedgerows, tree belts, open arable landscapes and recreational resources.	N/A		Large Adverse	N/A	
Townscape	The Project is typically located within Green Belt and along existing trunk roads. It would adversely affect a range of defined townscape areas due to their associations with the surrounding rural landscapes. In addition, the historic townscape character of the rural settlements at Thong (south of the River Thames) and	N/A		Large Adverse	N/A	

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £ (NPV)	Distributional 7 point scale / vulnerable group
		West Tilbury, Baker Street and North Ockendon (north of the River) would be adversely impacted due to their proximity to the Project. These settlements are designated conservation areas and there would be major changes on physical and perceptual qualities and characteristics including their setting.				
	Historic Environment	The Project has the potential to impact buried archaeological remains and built heritage, which would be caused by their partial or total removal by construction activity, causing a permanent impact. The Project would have significant impacts to archaeological remains in the area of the A122/A13 junction during construction, focused on the scheduled cropmark complex (SM1) and non-designated archaeological remains associated with this monument. Significant impacts to built heritage would occur during construction in the same area to 1 and 2 Grays Corner Cottages (LB89), Thatched Cottage (LB58) and Murrells Cottages (LB96). To the north east of the A122/A2 junction, Thong conservation area would experience significant permanent impacts during both construction and operation. To the east of the A122/A13 junction Baker Street Windmill (LB57) would experience significant permanent impacts during construction and operation. There would be permanent impacts to 4 scheduled monuments, multiple listed buildings, 4 conservation areas and 1 registered park and garden. Numerous archaeological and historic landscape features would also be permanently impacted.	N/A	Large Adverse	N/A	
	Biodiversity	The appraisal of the Project's potential effects on terrestrial biodiversity has been informed by the available historic information and data collected during comprehensive field surveys undertaken over a number of years. The main impacts on the ecology within the Project's zone of influence occur during the construction phase as habitats are lost and fragmented, including the loss of irreplaceable habitat such as ancient woodland and veteran trees, and habitat loss within Shorne and Ashenbank Wood SSSI. This is also the phase when the risks of species mortality are at their highest. All appropriate measures to offset impacts have been included through the Project's design, implementation of good practice construction methods and provision of essential measures to lessen adverse effects, including significant areas of woodland planting, open mosaic habitat creation, notably for the adverse effects on terrestrial invertebrates, and species translocation. Summary of numbers of key environmental resources in each scoring category: • Very large adverse: 3 • Large adverse: 6 • Moderate adverse: 4 • Slight adverse: 24 • Neutral: 10 • Beneficial: 3	N/A	Very Large Adverse	N/A	

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £ (NPV)	Distributional 7 point scale / vulnerable group
Social	Water Environment	The Project has the potential to cause deterioration in the quality of surface and groundwater bodies, as well as changes to surface and groundwater levels and flow regimes. These effects may be induced by discharges of construction phase and operational runoff, earthworks, groundwater control and new crossings of watercourses and their floodplains. However, by following construction good practice and by embedding mitigation into the Projects design, effects on the water environment can be successfully avoided or reduced.	N/A	Slight Adverse	N/A	
	Commuting and Other users	Journey time and vehicle operating cost savings for commuters and other users arise due to reduced congestion and improved connectivity. Small user charge disbenefits are due to additional or rerouted cross river journeys which incur charges on both the new and existing crossings. Net user benefits would be felt by all income quintiles and distributed evenly by income quintile.	Value of journey time changes (£): £1,378m Net journey time changes (£) 0 to 2 min: -£43m; 2 to 5 min: £234m; > 5 min: £1,186m	N/A	£869m	Income: Moderate Beneficial
	Reliability impact on Commuting and Other users	The Project would improve journey time reliability for journeys across the River Thames and on the wider road network by providing an alternative route which would reduce the impact of incidents, reduce the variability of travel times and minimise diversions on local roads.	N/A	N/A	£304m	
	Physical activity	Whilst there is not anticipated to be a significant modal shift to walking, cycling or equestrian use as a result of the Project, there are provisions for reconnected Public Rights of Way (PRoW) and cycle routes, for improvements to existing routes and for new sections of route to be created. This is likely to result in a moderate positive impact on physical activity overall, with a continued benefit to existing users and encouraging physical activity by new users.	N/A	Moderate Positive	N/A	
	Journey quality	The change in impact across the journey quality factors of traveller care, views and stress is, on balance, likely to be beneficial and large, affecting more than 10,000 travellers per day. Improvements in traveller stress arise through reductions in congestion at the Dartford Crossing and approach roads, resulting in improved accessibility. The effect on vehicle travellers in relation to views from the road during the operation phase is likely to be positive.	N/A	Large Positive	N/A	
	Accidents	DfT's COBALT tool has been used to appraise accidents and shows a net increase in the number and value of accidents across the road network due to the Project. There is one location which is predicted to have a decrease in casualties as a result of a decrease in traffic flows. There are five locations that are predicted to have an increase in casualties as a result of an increase in traffic flows. There is no distributional impact by any of the vulnerable user groups, compared with the COBALT study area or Great Britain.	There are forecast to be 2,147 additional accidents over 60 years, including 26 fatalities, 220 serious injuries and 3,122 slight injuries	N/A	-£84m	Children: Neutral Adults aged 70 and over: Neutral Pedestrians: Neutral Cyclists: Neutral Motorcyclists: Neutral Male 16-25 year olds: Neutral
	Security	The Project is expected to have an overall neutral impact on the personal security of drivers and vehicle occupants in the tunnel, along the route and at crossing points. Personal security of pedestrians, cyclists and equestrians at crossing points has also been assessed as neutral – whilst some crossings would be	N/A	Neutral	N/A	

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £ (NPV)	Distributional 7 point scale / vulnerable group
		improved through lighting, environment and gradient, others may require underpasses which potentially have an adverse impact on personal security.				
	Access to services	Not appraised because TAG guidance advises that this impact relates to public transport projects.	N/A	N/A	N/A	
	Affordability	Generally, personal affordability would not be affected by the Project as the Without Scheme travel routes and operating costs would still be available. There is, therefore, no overall impact of the Project on personal affordability for most users. Journeys by Gravesham residents to and from destinations north of the River Thames would be proportionately cheaper than in a scenario without the Project because cross-river road user charges would be reduced through a user charge discount. The distribution of this impact is even across all income quintiles because Gravesham residents have an income distribution in line with England.	N/A	Slight Positive	N/A	Gravesham residents: Moderate Beneficial
	Severance	The majority of routes severed by the Project would be re-instated using bridges or underpasses. Traffic related severance would increase in a small number of locations, potentially affecting less than 1% of the population within the regional study area, representing a Neutral impact. The proportion of vulnerable groups impacted is similar regardless of whether the roads have a beneficial or adverse impact. There is a smaller than expected impact of traffic related severance on non-car owning households.	N/A	Neutral	N/A	Car ownership: Neutral Children under 16: Neutral People aged 70 and over: Neutral People with a limiting long-term illness: Neutral
	Option and non-use values	The Project would give road users an alternative route to cross the River Thames and allow the potential development of land adjacent to the route.	N/A	Large Positive	N/A	
Public Accounts	Cost to Broad Transport Budget	There are two impacts on the transport budget: the capital costs of construction; and the subsequent operational, maintenance and renewals costs of the physical and charging infrastructure, offset by the change in revenue collected from the Project and elsewhere from user charges.	Investment costs £3,279m Operating, maintenance and renewals cost £434m Operator revenue £836m	N/A	£2,877m	
	Indirect Tax Revenues	The Project would increase indirect tax revenue for central government due to additional traffic using the road network.	N/A	N/A	£35m	