

# A27 Chichester Bypass

Appraisal Summary Table

(updated 28 July 2016)



## Appraisal Summary Table – List of Amendments

The following changes have been made since the version issued on 14 July 2016.

### Corrections

Version	Page	Para/Table/Figure	Comment
14 July 2016	Option 2	Historic Environment / Summary of key impacts	Text amended to include the proposed demolition of a Grade II Listed building north of Stockbridge junction, to enable the realignment of Stockbridge Road.
	Option 2	Historic Environment / Qualitative assessment	Assessment amended to Major adverse

Appraisal Summary Table		Date produced:	20 June 2016			Contact:					
Name of scheme:		A27 Chichester Bypass Improvement Scheme - Option 1				Name	Abi Oluwande				
Description of scheme:		This Scheme involves improvements of the junctions on the A27 Bypass near Chichester to increase capacity. Five Options have been tested as described in the Environmental Assessment Report and the Traffic Forecasting Report. This AST is for Option 1 which comprises Fishbourne Roundabout to be grade-separated with the A27 flying over the local roads. To improve junction capacity Terminus Road would be diverted on to Cathedral Way. At Stockbridge and Whyke Junctions the existing roundabouts would be replaced with signalised junctions. Right turns from all arms would be banned and dedicated lanes would be provided for left turning traffic. Bognor Road Roundabout would be grade-separated with the A27 flying over the local roads. Vinnetrod Road would be diverted to join the A259 east of the existing roundabout via a new at-grade roundabout. The traffic signal junction at Oving Crossroads would be removed with a left-in left-out only to be retained, while access to Oving Road East would also be removed. Portfield roundabout would be remarked to increase capacity. Works at Oving and Portfield are modifications to the proposals considered by Shopwhyke Lakes housing development here.				Organisation	Highways England	Role	Project Manager		
Impacts		Summary of key impacts			Assessment						
					Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp			
Economy	Business users & transport providers	Business users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £149.3m PV and £8.3m PV respectively. In addition they will experience -£7.4m delays due to construction and future maintenance, giving an overall net benefit of £150.2m PV.			Value of journey time changes(£)	£149.3m		Not applicable	£150.2m	Not assessed at this stage	
					Net journey time changes (£)						
					0 to 2min	2 to 5min	> 5min	Not applicable			
					£15.1m	£108.7m	£25.5m	Not applicable			
	Reliability impact on Business users	Journey time reliability is expected to improve noticeably for users and other travellers in the vicinity.			£149.7m			Not applicable	£149.7m		
	Regeneration	Not assessed at this stage			Not assessed at this stage			Not applicable	Not assessed at this stage		
	Wider Impacts	Not assessed at this stage			Not assessed at this stage			Not applicable	Not assessed at this stage		
Environmental	Noise	Results indicate overall NPV dis-benefit. The existing A27 includes a number of Noise Important Areas for which mitigation has been incorporated into the Scheme.			Households experiencing increased daytime noise: 1932 Households experiencing reduced daytime noise: 549 Households experiencing increased night time noise: 1932 Households experiencing reduced night time noise: 549			Not applicable	NPV: -£5,732,429 (Negative value reflects net dis-benefit)	Not assessed at this stage	
	Air Quality	The WebTAG local air quality assessment procedure indicates there is an improvement of air quality within the study area overall. The Scheme does not result in an exceedence of the NO2 or PM10 air quality limit values.  • Orchard Street AQMA - There is a predicted benefit within the Orchard Street AQMA with predicted concentrations achieving the NO2 AQOs in both the Do Minimum and Do Something Scenarios. • St Pancras AQMA – There is a predicted benefit within the St Pancras AQMA although annual mean NO2 concentrations still exceed the AQO. • Stockbridge Roundabout AQMA – There is a predicted deterioration at some receptors within the AQMA and a predicted benefit at others. This Option could lead to a change in spatial extent of the Stockbridge Roundabout AQMA.  The assessment predicts a minor negative impact on regional emissions of NOx and PM10.			Local air quality effects at properties (Improvements / No effect / Deterioration) NO2 2020 (7384 / 521 / 3693) PM10 2020 (5606 / 1535 / 4457)  Overall Assessment Score (negative score reflects benefit) NO2: (2020): minus -1707.9 PM10: (2020): -628.2  Change in Regional Emissions NOx (2020): 12 tonnes/year PM10 (2020): 1.5 tonnes/year			Not applicable	Value of change in PM concentrations: NPV: £3,203,273  Value of change in NOx emissions: NPV: minus £-351,111  (Positive value reflects net benefit) Total value of change in air quality NPV: £2,852,162	Not assessed at this stage	
	Greenhouse gases	Increase in GHG emissions are due to increased fuel consumption, which is related to either slightly longer distances travelled or changes in the speed profile leading to a negative NPV.			Change in non-traded carbon over 60y (CO2e)	27004		Not applicable	-£1,185,941		
					Change in traded carbon over 60y (CO2e)	486					
	Landscape	Townscape impacts only relevant			Not applicable			Not applicable	Not applicable		
	Townscape	The northern extent of the study area is characterised by the historic city of Chichester and its associated residential, commercial and light industrial use. To the south the area becomes more rural in nature with open fields and mature vegetation becoming the dominant feature along with numerous lakes and water features including the historic Chichester Ship Canal. Chichester Harbour Area of Outstanding Natural Beauty, in the southwest area of Chichester, is a valued landscape and consequently has a high sensitivity to change. A number of listed buildings are located within 1km as well as the Fishbourne Palace Scheduled Monument. The effects associated with this Option would be minimal for at grade junctions, however the grade separated junctions at Fishbourne and Bognor would form notable features in the view from local residential properties situated around the junctions. The grade separated junction at Fishbourne would be lit in close proximity to Chichester Harbour AONB. There would be direct, albeit very limited effects upon the very northern periphery of the Chichester Harbour AONB, although the effect upon the AONB as a whole would be somewhat contained by existing intervening vegetation which would soften, if not screen the route from large parts of the AONB, although significant effects may be afforded by receptors on the periphery. Grade separated junctions would also have more significant effects due to the required removal of a very small number of properties to accommodate the Scheme. There would also be an effect upon the lakes to the west of the Bognor junction, where widening to the existing highway boundary and the railway bridge would be necessary to accommodate the change in grade leading to the new grade separated junction.			Not applicable			Slight Adverse	Not applicable		
	Historic Environment	The proposed works are likely to have an effect upon the setting of four listed buildings. The route passes through one Conservation Area (Fishbourne) which would have its character and setting altered and would pass in close proximity to another (Chichester). Impacts on the Scheduled Ancient Monument at Fishbourne Roman Palace would be negligible as the Option is contained within the existing road near the asset. There would be no impact on its setting as there is a modern village and a museum over the top of the scheduled monument. There is a high potential for the Scheme to impact known and unknown archaeological remains.			Not applicable			Moderate Adverse	Not applicable		
	Biodiversity	There would be an adverse effect on Biodiversity with removal of vegetation, as well as, potential loss and severance of habitat, for the installation of new highways infrastructure, which would result in an adverse effect for habitats and potential EPS. The Scheme would have direct effect upon two designated sites, Fishbourne Meadows SNCI, Chichester Gravel Pits and Leythorne Meadows SNCI. Mitigation measures to mitigate for potential effects would be undertaken during construction. This would include habitat management and replacement planting, where necessary. Chichester Harbour would not be directly affected though there is potential for pollution incidents affecting the SPA, due to hydrological links with works, but this would be controlled through mitigation measures in the site drainage design.			Not applicable			Slight Adverse	Not applicable		
Water Environment	Option 1 is unlikely to affect water resources, as works would largely be within the existing highways footprint and standard mitigation measures during construction and operation, including adherence to Best Practice measures and EA and CIRIA guidance, would prevent adverse effects from pollutants or increased surface water run-off. There would be a slight adverse impact on Leythorne Lake due to embankments required to construct slip roads for the grade separation of Bognor Roundabout, but this would not affect the overall summary assessment score. While a risk of disturbance of contaminated ground exists, due to the small scale of the works, this is a very low risk and therefore Option 1 is considered to have a negligible effect. Option 1 would maintain existing flood flow paths and therefore the risk of affecting flood risks would be low. However even minor changes to ground levels have the potential to affect flood risk, and therefore detailed hydraulic modelling using final design dimensions would be required.			Not applicable			Neutral	Not applicable			
Social	Commuting and Other users	Commuting and Other users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £233.7m PV and -£15.5m PV respectively. In addition they will experience -£11.4m delays due to construction and future maintenance, giving an overall net benefit of £206.8m PV.			Value of journey time changes(£)	£233.6m		Not applicable	£206.8m	Not assessed at this stage	
					Net journey time changes (£)						
					0 to 2min	2 to 5min	> 5min				
					£29.2m	£162.7m	£41.7m				
		Reliability impact on Commuting and Other users	Journey time reliability is expected to improve markedly for users and other travellers in the vicinity.			£78.1m			Not applicable	£78.1m	
		Physical activity	There are several NMU routes that would be severed at the majority of junctions along the A27. However most would be replaced and/or improved, having a neutral effect on physical activity.			Not applicable			Neutral	Not applicable	
		Journey quality	Option 1 is anticipated to improve traveller care through the provision of new traffic signage and advanced directional signage that would be provided and improved. Travellers views are not anticipated to significantly alter with this Option in place. Traveller stress would slightly reduce on the whole, with improvements to a number of key junctions, whilst new safety related infrastructure such as new lane markings, cats eyes and road studs would be installed.			Not applicable			Large Beneficial	Not applicable	
		Accidents	The full accident analysis is reported in A27 Economic Assessment Report which shows that there is expected to be an increase of 2% in accidents across the study area when the improvements of various junction are in place.			-£8.5m			Not applicable	-£8.5m	Not assessed at this stage
		Security	Option 1 includes alternative junction layouts at each of the six junction locations but no change to the existing online route of the A27 Chichester Bypass.			Not applicable			Neutral	Not applicable	Not assessed at this stage
		Access to services	Accessibility for non-motorised users to local services would change in both a positive and negative way with some existing routes severed whilst new routes would also be created. No services such as churches, schools and hospitals would be demolished or access altered. There are no existing or proposed bus stops on the A27 carriageway however a large number of bus routes utilise the A27 carriageway and its junctions. A reduction in journey times due to improved traffic flow is anticipated for bus routes that pass through or go left at Whyke, Stockbridge and Fishbourne roundabouts, although traffic flows through Bognor junction are anticipated to potentially lengthen journey time at some times of the day. Buses that currently turn right at Stockbridge and Whyke roundabouts would no longer be able to do so, potentially reducing accessibility. Future provision, routing, frequencies and waiting facilities for buses are currently unknown at this stage of the Scheme.			Not applicable			Slight Beneficial	Not applicable	Not assessed at this stage
Public Accounts	Affordability	Decreases in vehicle operating costs associated with reduced congestion and faster journey times are anticipated however some journeys could become longer in distance resulting in vehicle cost increases.			Not Assessed at this Stage			Not Assessed at this Stage	Not Assessed at this Stage	Not assessed at this stage	
	Severance	This Option does not include proposed new links or changes to road crossing provision. However traffic modelling results indicate significant increases in vehicle flow along the A27.			Not Assessed at this Stage			Not Assessed at this Stage	Not Assessed at this Stage	Not assessed at this stage	
	Option and non-use values	Option and non-use values are assessed only for schemes that involve the introduction of a new transport mode, or the removal of an existing one, and are therefore not in the scope of this project.			Not applicable			Not applicable	Not applicable		
	Cost to Broad Transport Budget	This Option will require an investment in the transport network of £123.4m PV. Operating and Maintenance costs over 60 years amount to £13.8m PV, giving a total PV of costs of some £137.2m.			£137.2m			Not applicable	£137.2m		
	Indirect Tax Revenues	As a result of an increase in operating costs (non fuel related) particularly for other and commuting users category, there will be a gain in indirect taxation of £3.7m (PV over 60 years).			£3.7m			Not applicable	£3.7m		

Appraisal Summary Table		Date produced:	20 June 2016		Contact:			
Name of scheme:		A27 Chichester Bypass Improvement Scheme - Option 1A			Name	Abi Oluwande		
Description of scheme:		This Scheme involves improvements of the junctions on the A27 Bypass near Chichester to increase capacity. Five Options have been tested as described in the Environmental Assessment Report and the Traffic Forecasting Report. This AST is for Option 1A which comprises Fishbourne Roundabout to be grade-separated with the A27 flying over the local roads. To improve junction capacity Terminus Road would be diverted on to Cathedral Way. Bognor Road Roundabout would be grade-separated with the A27 flying over the local roads. Vinnertow Road would be diverted to join the A259 east of the existing roundabout via a new at-grade roundabout. The traffic signal junction at Oving Crossroads would be removed with a left-in left-out only to be retained, while access to Oving Road East would also be removed. Portfield roundabout would be remarked to increase capacity. Works at Oving and Portfield are modifications to the proposals considered by Shopwhyke Lakes housing development here.			Organisation	Highways England		
Impacts		Summary of key impacts			Assessment			
					Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp		
		Quantitative			Qualitative			
		Value of journey time changes(£)			£115m	Not applicable		
		Net journey time changes (£)				Not applicable		
		0 to 2min	2 to 5min	> 5min		Not applicable		
		£49m	£51.9m	£14.1m		Not applicable		
					£59.8m	Not applicable		
					Not assessed at this stage	Not assessed at this stage		
					Not assessed at this stage	Not assessed at this stage		
Economy	Business users & transport providers	Business users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £114.9m PV and £7.5m PV respectively. In addition they will experience -£7m delays due to construction and future maintenance, giving an overall net benefit of £115.6m PV.				Not assessed at this stage		
	Reliability impact on Business users	Journey time reliability is expected to improve noticeably for users and other travellers in the vicinity.						
	Regeneration	Not assessed at this stage						
	Wider Impacts	Not assessed at this stage						
Environmental	Noise	Results indicate overall NPV dis-benefit. The existing A27 includes a number of Noise Important Areas for which mitigation has been incorporated into the Scheme.			Households experiencing increased daytime noise: 1932 Households experiencing reduced daytime noise: 549 Households experiencing increased night time noise: 1932 Households experiencing reduced night time noise: 549	Not applicable	NPV: -£5,321,930 (Negative value reflects net dis-benefit)	Not assessed at this stage
	Air Quality	The WebTAG local air quality assessment procedure indicates there is an improvement of air quality within the study area overall. The Scheme does not result in an exceedance of the NO2 or PM10 air quality limit values.  • Orchard Street AQMA - There is a predicted benefit within the Orchard Street AQMA with predicted concentrations achieving the NO2 AQOs in both the Do Minimum and Do Something Scenarios. • St Pancras AQMA – There is a predicted benefit within the St Pancras AQMA although annual mean NO2 concentrations still exceed the AQO. • Stockbridge Roundabout AQMA – There is a predicted deterioration in air quality at receptors within the AQMA, and exceedances of the AQO at these receptors in the Do-Something scenario.  The assessment predicts a minor negative impact on regional emissions of NOx and PM10.			Local air quality effects at properties (Improvements / No effect / Deterioration) NO2 2020 (7534 / 64 / 5079) PM10 2020 (6862 / 1580 / 4235)  Overall Assessment Score (negative score reflect benefit) NO2 (2020): minus -755.4 PM10 (2020): -488.7  Change in Regional Emissions NOx (2020): 6.4 tonnes/year PM10 (2020): 0.8 tonnes/year	Not applicable	Value of change in PM concentrations: NPV: £742,982  Value of change in NOx emissions: NPV: minus £-162,589  (Positive value reflects net benefit) Total value of change in air quality NPV: £580,393	Not assessed at this stage
	Greenhouse gases	Reductions in GHG emissions are due to reduced fuel consumption, which is related to either slightly shorter distances travelled or changes in the speed profile leading to a positive NPV. A decrease in HGVs in this scenario causes a decrease to the non-traded emissions with an increase in the traded emissions for LDVs.			Change in non-traded carbon over 60y (CO2e) -20828 Change in traded carbon over 60y (CO2e) 208	Not applicable	£1,023,516	
	Landscape	Townscape impacts only relevant			Not applicable			
	Townscape	The northern extent of the study area is characterised by the historic city of Chichester and its associated residential, commercial and light industrial use. To the south the area becomes more rural in nature with open fields and mature vegetation becoming the dominant feature along with numerous lakes and water features including the historic Chichester Ship Canal. Chichester Harbour Area of Outstanding Natural Beauty, in the southwest area of Chichester, is a valued landscape and consequently has a high sensitivity to change. A number of listed buildings are located within 1km as well as the Fishbourne Palace Scheduled Monument. Fishbourne Conservation Area is located a short distance from the Scheme. The effects associated with this Option would be minimal for at grade junctions, however the grade separated junctions at Fishbourne and Bognor would form notable features in the view from local residential properties situated around the junctions. The grade separated junction at Fishbourne would be lit in close proximity to Chichester Harbour AONB. There would be direct, albeit very limited effects upon the very northern periphery of the Chichester Harbour AONB, although the effect upon the AONB as a whole would be somewhat contained by existing intervening vegetation which would soften, if not screen the route from large parts of the AONB, although significant effects may be afforded by receptors on the periphery. Grade separated junctions would also have more significant effects due to the required removal of a very small number of properties to accommodate the Scheme. There would also be an effect upon the lakes to the west of the Bognor junction, where widening to the existing highway boundary would be necessary to accommodate the change in grade leading to the new grade separated junction.			Not applicable	Slight Adverse	Not applicable	
	Historic Environment	The proposed works are likely to have an effect upon the setting of four listed buildings. The route passes through one Conservation Area (Fishbourne) which would have its character and setting altered and would pass in close proximity to another (Chichester). Effects on the Scheduled Ancient Monument at Fishbourn Roman Palace would be negligible as the Option is contained within the existing road near the asset. There would be no effect on its setting as there is a modern village and a museum over the top of the scheduled monument. There is a high potential for the Scheme to affect known and unknown archaeological remains.			Not applicable	Moderate Adverse	Not applicable	
	Biodiversity	There would be an adverse effect on Biodiversity with removal of vegetation, as well as, potential loss and severance of habitat, for the installation of new highways infrastructure, which would result in an adverse effect for habitats and potential EPS. The Scheme would have direct impact upon two designated sites, Fishbourne Meadows SNCI, Chichester Gravel Pits and Leythorne Meadows SNCI. Mitigation measures to mitigate for potential impacts would be undertaken during construction. This would include habitat management and replacement planting, where necessary. Chichester Harbour would not be directly impacted though there is potential for pollution incidents affecting the SPA, due to hydrological links with works, but this would be controlled through mitigation measures in the site drainage design.			Not applicable	Slight Adverse	Not applicable	
Water Environment	Option 1A is unlikely to affect water resources, as works would largely be within the existing highways footprint and standard mitigation measures during construction and operation, including adherence to Best Practice measures and EA and CIRIA guidance, would prevent adverse effects from pollutants or increased surface water run-off. There would be a slight adverse impact on Leythorne Lake due to embankments required to construct slip roads for the grade separation of Bognor Roundabout, but this would not affect the overall summary assessment score. While a risk of disturbance of contaminated ground exists, due to the small scale of the works, this is a very low risk and therefore Option 1A is considered to have a negligible effect. Option 1A would maintain existing flood flow paths and therefore the risk of affecting flood risks would be low. However even minor changes to ground levels have the potential to affect flood risk, and therefore detailed hydraulic modelling using final design dimensions would be required.			Not applicable	Neutral	Not applicable		
Social	Commuting and Other users	Commuting and Other users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £182.2m PV and -£3.3m PV respectively. In addition they will experience -£11.4m delays due to construction and future maintenance, giving an overall net benefit of £167.5m PV.			Value of journey time changes(£) £182.3m Net journey time changes (£) 0 to 2min 2 to 5min > 5min £76.8m £76.2m £29.3m	Not applicable	£167.5m	Not assessed at this stage
	Reliability impact on Commuting and Other users	Journey time reliability is expected to improve markedly for users and other travellers in the vicinity.			£26.1m	Not applicable	£26.1m	
	Physical activity	There are several NMU routes that would be severed at the majority of junctions along the A27. However most would be replaced and/or improved, having a neutral effect on physical activity.			Not applicable	Neutral	Not applicable	
	Journey quality	Option 1A is anticipated to improve traveller care through the provision of new traffic signage and advanced directional signage that would be provided and improved. Travellers views are not anticipated to significantly alter with this Option in place. Traveller stress would slightly reduce on the whole, with improvements to several key junctions. New safety related infrastructure such as new lane markings, cats eyes and road studs would also be installed.			Not applicable	Large Beneficial	Not applicable	
	Accidents	The full accident analysis is reported in A27 Economic Assessment Report which shows that there is expected to be a decrease of -0.4% in accidents across the study area when the improvements of various junction are in place.			£1.9m	Not applicable	£1.9m	Not assessed at this stage
	Security	Option 1A includes alternative junction layouts at four of the six junction locations but no change to the existing online route of the A27 Chichester Bypass.			Not applicable	Neutral	Not applicable	Not assessed at this stage
	Access to services	Accessibility for non-motorised users to local services would change in both a positive and negative way with some existing routes severed whilst new routes would also be created. No services such as churches, schools and hospitals would be demolished or access altered. There are no existing or proposed bus stops on the A27 carriageway however a large number of bus routes utilise the A27 carriageway and its junctions. Traffic flows through Bognor junction are anticipated to potentially lengthen journey time at some times of the day. Bus routes are not anticipated to be altered. Future provision, routing, frequencies and waiting facilities for buses are currently unknown at this stage of the Scheme.			Not applicable	Slight Beneficial	Not applicable	Not assessed at this stage
	Affordability	Decreases in vehicle operating costs associated with reduced congestion and faster journey times are anticipated however some journeys could become longer in distance resulting in vehicle cost increases.			Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage
	Severance	This Option does not include proposed new links or changes to road crossing provision. However traffic modelling results indicate significant increases in vehicle flow along the A27.			Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage
	Option and non-use values	Option and non-use values are assessed only for schemes that involve the introduction of a new transport mode, or the removal of an existing one, and are therefore not in the scope of this project.			Not applicable	Not applicable	Not applicable	
Public Accounts	Cost to Broad Transport Budget	This Option will require an investment in the transport network of £97.0m PV. Operating and Maintenance costs over 60 years amount to £15.1m PV, giving a total PV of costs of some £112.2m.			£112.2m	Not applicable	£112.2m	
	Indirect Tax Revenues	As a result of a decrease in operating costs particularly for business users, there will be a loss in indirect taxation of £1.1m (PV over 60 years).			-£1.1m	Not applicable	-£1.1m	

Appraisal Summary Table		Date produced:	20 June 2016			Contact:				
Name of scheme:		A27 Chichester Bypass Improvement Scheme - Option 2				Name	Abi Oluwande			
Description of scheme:		This Scheme involves improvements of the junctions on the A27 Bypass near Chichester to increase capacity. Five Options have been tested as described in the Environmental Assessment Report and the Traffic Forecasting Report. This AST is for Option 2 which comprises Fishbourne and Bognor Road roundabouts to be grade-separated, with Terminus Road diverted onto Cathedral Way at Fishbourne, and Vinnertow Road diverted onto the A259 at Bognor Road. Stockbridge and Whyke Junctions would be closed with the side roads passing over the A27 with no connection between them. The traffic signal junction at Oving Crossroads would be removed with a left-in left-out only to be retained, while access to Oving Road East would also be removed. Portfield roundabout would be remarked to increase capacity. Works at Oving and Portfield are modifications to the proposals considered by Shopwhyke Lakes housing development here. To compensate for the loss of connection at Stockbridge and Whyke junctions, a single carriageway link road has been proposed from Fishbourne Junction down to join to the B2145 (the Stockbridge/Whyke Link Road).				Organisation	Highways England			
Impacts		Summary of key impacts			Assessment					
					Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp		
Economy	Business users & transport providers	Business users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £221.5m PV and £13.5m PV respectively. In addition they will experience about -£12.8m delays due to construction and future maintenance, giving an overall net benefit of £222.1m PV.			Value of journey time changes(£)	£221.6m	Not applicable	£222.1m	Not assessed at this stage	
					Net journey time changes (£)					
					0 to 2min	2 to 5min	> 5min			
					£36.2m	£122.8m	£62.6m			
	Reliability impact on Business users	Journey time reliability is expected to improve noticeably for users and other travellers in the vicinity.			£164.7m			Not applicable	£164.7m	
	Regeneration	Not assessed at this stage			Not assessed at this stage			Not assessed at this stage		
	Wider Impacts	Not assessed at this stage			Not assessed at this stage			Not assessed at this stage		
Environmental	Noise	Results indicate overall NPV dis-benefit. The existing A27 includes a number of Noise Important Areas for which mitigation has been incorporated into the Scheme.			Households experiencing increased daytime noise: 1932 Households experiencing reduced daytime noise: 549 Households experiencing increased night time noise: 1932 Households experiencing reduced night time noise: 549			Not applicable	NPV: -£4,023,285 (Negative value reflects net dis-benefit)	Not assessed at this stage
	Air Quality	The WebTAG local air quality assessment procedure indicates there is an improvement of air quality within the study area overall. The Scheme does not result in an exceedance of the NO2 or PM10 air quality standards or limit values.  • Orchard Street AQMA - There is a predicted benefit within the Orchard Street AQMA with predicted concentrations achieving the NO2 AQOs in both the Do Minimum and Do Something Scenarios. • St Pancras AQMA – There is a predicted benefit within the St Pancras AQMA although NO2 concentrations still exceed the annual mean NO2 AQO. • Stockbridge Roundabout AQMA – There is a predicted benefit within the AQMA with predicted concentrations achieving the NO2 AQO in the Do Something Scenario.  The assessment predicts a minor negative impact on regional emissions of NOx and PM10.			Local air quality effects at properties (Improvements / No effect / Deterioration) NO2 2020 (7853 / 1197 / 4389) PM10 2020 (6108 / 2624 / 4707)  Overall Assessment Score (negative score reflect benefit) NO2: (2020): minus -1894.8 PM10: (2020): minus -1327.4  Change in Regional Emissions NOx (2020): 14 tonnes/year PM10 (2020): 2 tonnes/year			Not applicable	Value of change in PM concentrations: NPV: £2,604,933  Value of change in NOx emissions: NPV: minus £-417,499  (Positive value reflects net benefit) Total value of change in air quality NPV: £2,187,434	Not assessed at this stage
	Greenhouse gases	Increase in GHG emissions are due to increased fuel consumption, which is related to either slightly longer distances travelled or changes in the speed profile leading to a negative NPV.			Change in non-traded carbon over 60y (CO2e)	5915	Not applicable	-£191,673		
	Landscape	Townscape impacts only relevant			Not applicable			Not applicable		
	Townscape	The northern extent of the study area is characterised by the historic city of Chichester and its associated residential, commercial and light industrial use. To the south the area becomes more rural in nature with open fields and mature vegetation becoming the dominant feature along with numerous lakes and water features including the historic Chichester Ship Canal. Chichester Harbour Area of Outstanding Natural Beauty, in the southwest area of Chichester, is a valued landscape and consequently has a high sensitivity to change. A number of listed buildings are located within 1km as well as the Fishbourne Palace Scheduled Monument. The new grade separated junctions would form distinct changes within and immediately adjacent to the A27 corridor, including the removal of several properties around the junctions to accommodate the Scheme. Grade separated junctions at Fishbourne and Bognor would form notable features in the view from local residential properties situated around the junctions. The grade separated junction at Fishbourne would be lit in close proximity to Chichester Harbour AONB. There would be direct, albeit very limited effects upon the very northern periphery of the Chichester Harbour AONB, although the effect upon the AONB as a whole would be somewhat contained by existing intervening vegetation which would soften, if not screen the route from large parts of the AONB, although significant effects may be afforded by receptors on the periphery. There would also be an effect upon the lakes to the west of the Bognor junction, where widening to the existing highway boundary and the railway bridge would be necessary to accommodate the change in grade leading to the new grade separated junction. In addition to the online changes there would also be the introduction of a new single carriageway highway in the form of the Stockbridge Link Road (SLR) which would form a new highway (single carriageway) travelling south east from Fishbourne roundabout to just west of North Mundham on the B2145. The SLR which would see a change in land use from agricultural fields and hedgerows to a new single carriageway road and would potentially bring non-significant effects upon recreational users of local Public Rights of Ways and the Chichester Canal as the new SLR traverses the landscape.			Not applicable			Moderate Adverse	Not applicable	
Historic Environment	Major Adverse effect on Stockbridge House, with would be demolished for the realignment of Stockbridge Road for Stockbridge Junction. Slight to Moderate Adverse to 5 listed buildings which would be affected by the construction of Option 2 due to their close proximity to the proposed alterations to Fishbourne Junction. The route passes through one Conservation Area (Fishbourne) which would have its character and setting altered and would pass in close proximity to another (Chichester). Effects on the Scheduled Ancient Monument at Fishbourne Roman Palace would be negligible as the Option is contained within the existing road near the asset. There would be no effect on its setting as there is a modern village and a museum over the top of the scheduled monument. There is a high potential for the Scheme to affect known and unknown archaeological remains.			Not applicable			Major adverse	Not applicable		
Biodiversity	There would be an adverse effect on Biodiversity with removal of vegetation, as well as, potential loss and severance of habitat, for the installation of new highways infrastructure, which would result in an adverse effect for habitats and potential EPS. The Scheme would have direct impact upon two designated sites, Fishbourne Meadows SNCI, Chichester Gravel Pits and Leythorne Meadows SNCI. Mitigation measures to mitigate for potential impacts would be undertaken during construction. This would include habitat management and replacement planting, where necessary. Chichester Harbour would not be directly impacted though there is potential for pollution incidents affecting the SPA, due to hydrological links with works, but this would be controlled through mitigation measures in the site drainage design.			Not applicable			Slight Adverse	Not applicable		
Water Environment	Option 2 would have an adverse effect, mostly due to the proposed Stockbridge Link Road, which would cross the Lavant and its flood plain, the Chichester Canal, and numerous small ditches and watercourses in the low-lying area to the south of Chichester. Standard mitigation measures during construction and operation, including adherence to Best Practice measures and EA and CIRIA guidance, would prevent adverse effects from pollutants or increased surface water run-off and therefore effects would mostly be from the physical presence of the SLR changing flows patterns. There would also be an adverse impact on Leythorne Lake due to embankments required to construct slip roads for the grade separation of Bognor Roundabout. Option 2 would maintain existing flood flow paths and therefore the risk of affecting flood risks would be low. However even minor changes to ground levels have the potential to affect flood risk, and therefore detailed hydraulic modelling using final design dimensions would be required. The Stockbridge Link Road proposed as part of this Option could impact the flood extent and flood levels, though no development is present in the area. This could be mitigated using an open span bridge or culvert(s) to maintain the existing flow path.			Not applicable			Slight Adverse	Not applicable		
Social	Commuting and Other users	Commuting and Other users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £354.3m PV and -£14.9m PV respectively. In addition they will experience -£18.8m delays due to construction and future maintenance, giving an overall net benefit of £320.5m PV.			Value of journey time changes(£)	£354.3m	Not applicable	£320.5m	Not assessed at this stage	
					Net journey time changes (£)					
					0 to 2min	2 to 5min				> 5min
					£62.5m	£194.0m				£97.8m
		Reliability impact on Commuting and Other users	Journey time reliability is expected to improve markedly for users and other travellers in the vicinity.			£85.0m			Not applicable	£85.0m
		Physical activity	There are several NMU routes that would be severed at the majority of junctions along the A27. However most would be replaced and/or improved, having a neutral effect on physical activity.			Not applicable			Neutral	Not applicable
		Journey quality	Option 2 is anticipated to improve traveller care through the provision of new traffic signage and advanced directional signage that would be provided and improved. Travellers views are not anticipated to significantly alter with this Option in place. Traveller stress is also not anticipated to alter as a result of this Option with varied changes to congestion predicted on the existing A27 Chichester Bypass. New safety related infrastructure such as new lane markings, cats eyes and road studs would be installed. The new Stockbridge Link Road is anticipated to improve journey times and reliability and reduce driver stress for locals to the south of Chichester, and other road users travelling along this new road.			Not applicable			Large Beneficial	Not applicable
		Accidents	The full accident analysis is reported in A27 Economic Assessment Report which shows that there is expected to be a decrease of -2% in accidents across the study area when the improvements of various junction are in place.			£8.4m			Not applicable	£8.4m
	Security	Option 2 includes alternative junction layouts at each of the six junction locations plus additional highway Stockbridge Link Road.			Not applicable			Neutral	Not applicable	
	Access to services	Accessibility for non-motorised users to local services would change in both a positive and negative way with some existing routes severed whilst new routes would also be created. No services such as churches, schools and hospitals would be demolished or access altered. There are no existing or proposed bus stops on the A27 carriageway however a large number of bus routes utilise the A27 carriageway and its junctions. A reduction in journey times due to improved traffic flow is anticipated for bus routes that currently pass straight through Whyke and Stockbridge roundabouts, although traffic flows through Bognor junction are anticipated to potentially lengthen journey time at some times of the day. Additionally, new bus routes would utilise Stockbridge Link Road, increasing access and connectivity to a wider area, particularly the east. Buses that currently turn left or right at Stockbridge and Whyke roundabouts would no longer be able to do so, potentially reducing accessibility. Future provision, routing, frequencies and waiting facilities for buses are currently unknown at this stage of the Scheme.			Not applicable			Slight Beneficial	Not applicable	Not assessed at this stage
	Affordability	Decreases in vehicle operating costs associated with reduced congestion and faster journey times are anticipated however some journeys could become longer in distance resulting in vehicle cost increases.			Not assessed at this stage			Not assessed at this stage	Not assessed at this stage	
	Severance	This Option includes the introduction of a new southern link. Traffic modelling results indicate significant increases in flow along the A27 and reduced demand on links to the north of Chichester.			Not assessed at this stage			Not assessed at this stage	Not assessed at this stage	
	Option and non-use values	Option and non-use values are assessed only for schemes that involve the introduction of a new transport mode, or the removal of an existing one, and are therefore not in the scope of this project.			Not applicable			Not applicable	Not applicable	
Public Accounts	Cost to Broad Transport Budget	This Option will require an investment in the transport network of £191.6m PV. Operating and Maintenance costs over 60 years amount to £15.8m PV, giving a total PV of costs of some £207.3m.			£207.3m			Not applicable	£207.3m	
	Indirect Tax Revenues	As a result of an increase in operating costs particularly for other and commuting users (non-fuel VOC), there will be a gain in indirect taxation of £2.0m (PV over 60 years).			£2.0m			Not applicable	£2.0m	

Appraisal Summary Table		Date produced:	20 June 2016			Contact:				
Name of scheme:		A27 Chichester Bypass Improvement Scheme - Option 3				Name	Abi Oluwande			
Description of scheme:		This Scheme involves improvements of the junctions on the A27 Bypass near Chichester to increase capacity. Five Options have been tested as described in the Environmental Assessment Report and the Traffic Forecasting Report. This AST is for Option 3 which comprises the conversion of Fishbourne Roundabout to a hamburger layout with two lanes through the signalised roundabout. At Stockbridge and Whyke Junctions the existing roundabouts would be replaced with signalised junctions. Right turns from all arms would be banned and dedicated lanes would be provided for left turning traffic. Bognor Road Junction would be increased in size and signalised, with three lanes provided on the circulatory carriageway. Two straight ahead lanes would still be provided at Oving Road but right turns from the A27 would be prohibited. Left in, left out would be provided from Oving Road West with only Bus egress provided from Oving Road East. The westbound approach of Portfield Roundabout would be widened and a dedicated left turn lane from the eastern arm to the southern arm added. The works at Oving and Portfield are as indicated in the Shopwhyke Lake development and therefore progressed separately by the housing developer, hence not shown in the options illustrative layout.				Organisation	Highways England			
Impacts		Summary of key impacts			Assessment					
		Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp			
		Value of journey time changes(£)			£75.7m	Not applicable	£74.3m	Not assessed at this stage		
		Net journey time changes (£)				Not applicable				
		0 to 2min	2 to 5min	> 5min		Not applicable				
		£19.7m	£51.2m	£4.8m		Not applicable				
Economy		Business users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £75.7m PV and £3.8m PV respectively. In addition they will experience about -£5.2m delays due to construction and future maintenance, giving an overall net benefit of £74.3m PV.								
	Reliability impact on Business users	Journey time reliability is expected to improve noticeably for users and other travellers in the vicinity.			£109.7m	Not applicable	£109.7m			
	Regeneration	Not assessed at this stage			Not assessed at this stage	Not assessed at this stage	Not assessed at this stage			
	Wider Impacts	Not assessed at this stage			Not assessed at this stage	Not assessed at this stage	Not assessed at this stage			
Environmental		Noise			Results indicate overall NPV dis-benefit. The existing A27 includes a number of Noise Important Areas for which mitigation has been incorporated into the Scheme.					
	Noise				Households experiencing increased daytime noise: 1932 Households experiencing reduced daytime noise: 549 Households experiencing increased night time noise: 1932 Households experiencing reduced night time noise: 549	Not applicable	NPV: -£3,293,566 (Negative value reflects net dis-benefit)	Not assessed at this stage		
	Air Quality	The WebTAG local air quality assessment procedure indicates there is an improvement of air quality within the study area overall. The Scheme does not result in an exceedence of the NO2 or PM10 air quality standards or limit values.  • Orchard Street AQMA - There is a predicted benefit within the Orchard Street AQMA with predicted concentrations achieving the NO2 AQOs in both the Do Minimum and Do Something Scenarios. • St Pancras AQMA - There is a predicted benefit within the St Pancras AQMA although NO2 concentrations still exceed the annual mean NO2 AQO. • Stockbridge Roundabout AQMA - There is a predicted benefit within the AQMA although NO2 concentrations still exceed the annual mean NO2 AQO.  The assessment predicts a minor negative impact on regional emissions of NOx and PM10.			Local air quality effects at properties (Improvements / No effect / Deterioration) NO2 2020 (4133 / 278 / 4048) PM10 2020 (3049 / 1596 / 3814)  Overall Assessment Score (negative score reflect benefit) NO2: (2020): minus -1215.4 PM10: (2020): minus -4485.3  Change in Regional Emissions NOx (2020): 5 tonnes/year PM10 (2020): 1 tonnes/year	Not applicable	Value of change in PM concentrations: NPV: £2,842,446  Value of change in NOx emissions: NPV: minus £-112,926  (Positive value reflects net benefit) Total value of change in air quality NPV: £2,729,520	Not assessed at this stage		
	Greenhouse gases	Increase in GHG emissions are due to increased fuel consumption, which is related to either slightly longer distances travelled or changes in the speed profile leading to a negative NPV.			Change in non-traded carbon over 60y (CO2e) 38702 Change in traded carbon over 60y (CO2e) 335	Not applicable	-£1,752,268			
	Landscape	Townscape impacts only relevant			Not applicable	Not applicable	Not applicable			
	Townscape	The northern extent of the study area is characterised by the historic city of Chichester and its associated residential, commercial and light industrial use. To the south the area becomes more rural in nature with open fields and mature vegetation becoming the dominant feature along with numerous lakes and water features including the historic Chichester ship Canal. Chichester Harbour Area of Outstanding Natural Beauty, in the southwest area of Chichester, is a valued landscape and consequently has a high sensitivity to change. A number of listed buildings are located within 1km as well as the Fishbourne Palace Scheduled Monument. The impacts associated with this Option would be minimal due to all works occurring within the existing boundary of the A27 highway corridor. All works would result in at grade junctions with no reduction in visual amenity or degradation in character of the study area. Works would be in scale with the existing area of the A27. As such a neutral effect is recorded.			Not applicable	Neutral	Not applicable			
	Historic Environment	Option 3 is situated wholly within the existing A27 route corridor and therefore would not affect any heritage assets. Effects on the Scheduled Ancient Monument at Fishbourn Roman Palace would be negligible as the Option is contained within the existing road near the asset. There would be no effect on its setting as there is a modern village and a museum over the top of the scheduled monument.			Not applicable	Neutral	Not applicable			
	Biodiversity	There would be an adverse effect on Biodiversity with removal of vegetation, for the installation of new highways infrastructure, which would result in an adverse effect for habitats and potential EPS. The Scheme would not impact designated sites. Mitigation measures to mitigate for potential impacts would be undertaken during construction. This would include habitat management and replacement planting, where necessary. Chichester Harbour would not be directly impacted though there is potential for pollution incidents affecting the SPA, due to hydrological links with works, but this would be controlled through mitigation measures in the site drainage design.			Not applicable	Neutral	Not applicable			
	Water Environment	Option 3 is unlikely to affect water resources, as works would largely be within the existing highways footprint and standard mitigation measures during construction and operation, including adherence to Best Practice measures and EA and CIRIA guidance, would prevent adverse effects from pollutants or increased surface water run-off. While a risk of disturbance of contaminated ground exists, due to the small scale of the works, this is a very low risk and therefore Option 3 is considered to have a negligible effect. Option 3 would maintain existing flood flow paths and therefore the risk of affecting flood risks would be low. However even minor changes to ground levels have the potential to affect flood risk, and therefore detailed hydraulic modelling using final design dimensions would be required.			Not applicable	Neutral	Not applicable			
Social		Commuting and Other users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £119.0m PV and -£11.1m PV respectively. In addition they will experience -£7.2m delays due to construction and future maintenance, giving an overall net benefit of £100.7m PV.			Value of journey time changes(£) £119m Net journey time changes (£) 0 to 2min 2 to 5min > 5min £36.5m £74.2m £8.3m			Not applicable	£100.7m	Not assessed at this stage
	Reliability impact on Commuting and Other users	Journey time reliability is expected to improve markedly for users and other travellers in the vicinity.			£55.9m	Not applicable	£55.9m			
	Physical activity	There are several NMU routes that would be severed at the majority of junctions along the A27. However most would be replaced and/or improved, having a neutral effect on physical activity.			Not applicable	Neutral	Not applicable			
	Journey quality	Option 3 is anticipated to improve traveller care through the provision of new traffic signage and advanced directional signage that would be provided and improved. Travellers views are not anticipated to significantly alter with this Option in place, whilst changes to driver stress are anticipated to be minimal in the long term. New safety related infrastructure such as new lane markings, cats eyes and road studs would be installed.			Not applicable	Large Beneficial	Not applicable			
	Accidents	The full accident analysis is reported in A27 Economic Assessment Report which shows that there is expected to be a decrease of -1% in accidents across the study area when the improvements of various junction are in place.			£5.8m	Not applicable	£5.8m	Not assessed at this stage		
	Security	Option 3 includes alternative junction layouts at each of the six junction locations but no change to the existing online route of the A27 Chichester Bypass.			Not applicable	Neutral	Not applicable	Not assessed at this stage		
	Access to services	Accessibility for non-motorised users to local services would change in both a positive and negative way with some existing routes severed whilst new routes would also be created. No services such as churches, schools and hospitals would be demolished or access altered. There are no existing or proposed bus stops on the A27 carriageway however a large number of bus routes utilise the A27 carriageway and its junctions. A reduction in journey times due to improved traffic flow is anticipated for bus routes that pass through or to go left at Whyke and Stockbridge roundabouts, although traffic flows through Bognor junction are anticipated to potentially lengthen journey time at some times of the day. Buses that currently turn right at Stockbridge and Whyke roundabouts would no longer be able to do so, potentially reducing accessibility. Future provision, routing, frequencies and waiting facilities for buses are currently unknown at this stage of the Scheme.			Not applicable	Slight Beneficial	Not applicable	Not assessed at this stage		
	Affordability	Decreases in vehicle operating costs associated with reduced congestion and faster journey times are anticipated however some journeys could become longer in distance resulting in vehicle cost increases.			Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage		
	Severance	This Option does not include proposed new links or changes to road crossing provision. However traffic modelling results indicate significant increases in vehicle flow along the A27.			Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage		
	Option and non-use values	Option and non-use values are assessed only for schemes that involve the introduction of a new transport mode, or the removal of an existing one, and are therefore not in the scope of this project.			Not applicable	Not applicable	Not applicable			
Public Accounts		Cost to Broad Transport Budget			This Option will require an investment in the transport network of £32.3m PV. Operating and Maintenance costs over 60 years amount to £12.4m PV, giving a total PV of costs of some £44.8m.			£44.8m	Not applicable	£44.8m
	Indirect Tax Revenues	As a result of an increase in operating costs particularly for other and commuting users(Non-fuel VOC), there will be a gain in indirect taxation of £4.6m (PV over 60 years).			£4.6m	Not applicable	£4.6m			

Appraisal Summary Table		Date produced:	20 June 2016			Contact:				
Name of scheme:		A27 Chichester Bypass Improvement Scheme - Option 3A				Name	Abi Oluwande			
Description of scheme:		This Scheme involves improvements of the junctions on the A27 Bypass near Chichester to increase capacity. Five Options have been tested as described in the Environmental Assessment Report and the Traffic Forecasting Report. This AST is for Option 3A which comprises the conversion of Fishbourne Roundabout to a hamburger layout with two lanes through the signalised roundabout. At Stockbridge and Whyke Junctions the existing roundabouts would be replaced with signalised junctions. Right turns from all arms would be banned and dedicated lanes would be provided for left turning traffic. Bognor Roundabout would be grade separated, with the A27 constructed over the existing roundabout. The flyover construction would incorporate a widened Railway Bridge, Vinnetrod Road would be diverted on to the A259. Oving crossroads would remain as a traffic signalised junction with all right turns banned, except from Oving Road East and straight across movements banned. Oving Road East would be closed to all traffic except buses. At Portfield roundabout, the circulatory carriageway would be re-marked to provide three lanes from the A27 southern arm round to the Chichester bypass. The works at Oving and Portfield are as indicated in the Shopwhyke Lake development and therefore progressed separately by the housing developer, hence not shown in the options illustrative layout.				Organisation	Highways England		Role	Project Manager
Impacts		Summary of key impacts			Assessment					
		Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp			
		Value of journey time changes(£)								
		Net journey time changes (£)								
		0 to 2min	2 to 5min	> 5min						
		£12.9m	£106.8m	£21.3m						
		£136.3m			Not applicable	£142.4m	Not assessed at this stage			
Business users & transport providers		Business users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £141.1m PV and £7.6m PV respectively. In addition they will experience about -£6.2m delays due to construction and future maintenance, giving an overall net benefit of £142.4m PV.								
Reliability impact on Business users		Journey time reliability is expected to improve noticeably for users and other travellers in the vicinity.				£136.3m				
Regeneration		Not assessed at this stage			Not applicable	Not assessed at this stage				
Wider Impacts		Not assessed at this stage			Not assessed at this stage	Not assessed at this stage				
Noise		Results indicate overall NPV dis-benefit. The existing A27 includes a number of Noise Important Areas for which mitigation has been incorporated into the Scheme.			Households experiencing increased daytime noise: 1932 Households experiencing reduced daytime noise: 549 Households experiencing increased night time noise: 1932 Households experiencing reduced night time noise: 549	NPV: -£9,539,385 (Negative value reflects net dis-benefit)	Not assessed at this stage			
Air Quality		The WebTAG local air quality assessment procedure indicates there is an improvement of air quality within the study area overall. The Scheme does not result in an exceedence of the NO2 or PM10 air quality standards or limit values.  • Orchard Street AQMA - There is a predicted benefit within the Orchard Street AQMA with predicted concentrations achieving the NO2 AQOs in both the Do Minimum and Do Something Scenarios. • St Pancras AQMA – There is a predicted benefit within the St Pancras AQMA although NO2 concentrations still exceed the annual mean NO2 AQO. • Stockbridge Roundabout AQMA – There is a predicted deterioration at some receptors within the AQMA and a predicted benefit at others. This Option could lead to a change in spatial extent of the Stockbridge Roundabout AQMA.  The assessment predicts a minor negative impact on regional emissions of NOx and PM10.			Local Air quality effects at properties (Improvements / No effect / Deterioration) NO2 2020 (5833 / 1436 / 3986) PM10 2020 (4373 / 3252 / 3630)  Overall Assessment Score (negative score reflect benefit) NO2: (2020): minus -1337.7 PM10: (2020): minus -1233.9  Change in Regional Emissions NOx (2020): 15 tonnes/year PM10 (2020): 2 tonnes/year	Not applicable	Value of change in PM concentrations: NPV: £1,424,474  Value of change in NOx emissions: NPV: minus £-345,922  (Positive value reflects net benefit) Total value of change in air quality NPV: £1,078,552	Not assessed at this stage		
Greenhouse gases		Increase in GHG emissions are due to increased fuel consumption, which is related to either slightly longer distances travelled or changes in the speed profile leading to a negative NPV.			Change in non-traded carbon over 60y (CO2e) 22073 Change in traded carbon over 60y (CO2e) 425	-£951,693				
Landscape		Townscape impacts only relevant			Not applicable	Not applicable				
Townscape		The northern extent of the study area is characterised by the historic city of Chichester and its associated residential, commercial and light industrial use. To the south the area becomes more rural in nature with open fields and mature vegetation becoming the dominant feature along with numerous lakes and water features including the historic Chichester ship Canal. Chichester Harbour Area of Outstanding Natural Beauty, in the southwest area of Chichester, is a valued landscape and consequently has a high sensitivity to change. A number of listed buildings are located within 1km as well as the Fishbourne Palace Scheduled Monument and Fishbourne Conservation Area. The impacts associated with this Option would be minimised due to all works occurring either within or immediately adjacent to the existing boundary of the A27 highway corridor. Works would result in one grade separated junction, with all others at grade junctions. The grade separated junction and widening, although set in the context of the existing A27, would initiate a reduction in visual amenity or degradation in character of the immediate surrounding townscape.			Not applicable	Slight Adverse	Not applicable			
Historic Environment		Option 3A would pass close to one Conservation Area (Chichester) which would have its setting and character affected. Effects on the Scheduled Ancient Monument at Fishbourn Roman Palace would be negligible as the Option is contained within the existing road near the asset. There would be no effect on its setting as there is a modern village and a museum over the top of the scheduled monument. There is a high potential for the Scheme to affect known and unknown archaeological remains.			Not applicable	Moderate Adverse	Not applicable			
Biodiversity		There would be an adverse effect on Biodiversity with removal of vegetation, as well as potential loss and severance of habitat, for the installation of new highways infrastructure, which would result in an adverse effect for habitats and potential EPS. The Scheme would have direct impact upon one designated site, Chichester Gravel Pits and Leythorne Meadows SNCI. Mitigation measures to mitigate for potential impacts would be undertaken during construction. This would include habitat management and replacement planting, where necessary. Chichester Harbour would not be directly impacted though there is potential for pollution incidents affecting the SPA, due to hydrological links with works, but this would be controlled through mitigation measures in the site drainage design.			Not applicable	Slight Adverse	Not applicable			
Water Environment		Option 3A is unlikely to affect water resources, as works would largely be either within the existing highways footprint or within non-greenfield land adjacent to the existing highway. Standard mitigation measures during construction and operation would prevent adverse effects from pollutants or increased surface water run-off. There would be an adverse impact on Leythorne Lake due to embankments required to construct slip roads for the grade separation of Bognor Roundabout, and for the addition of the extra lane, and therefore Option 3A is considered to have an adverse effect. Option 3A would maintain existing flood flow paths and therefore the risk of affecting flood risks would be low. However even minor changes to ground levels have the potential to affect flood risk, and therefore detailed hydraulic modelling using final design dimensions would be required.			Not applicable	Slight Adverse	Not applicable			
Commuting and Other users		Commuting and Other users benefit significantly from the improvement of the junctions on the Chichester Bypass through reduced travel time and vehicle operating costs amounting to £217.9m PV and -£13.6m PV respectively. In addition they will experience -£9.5m delays due to construction and future maintenance, giving an overall net benefit of £194.8m PV.			Value of journey time changes(£) £218m Net journey time changes (£) 0 to 2min 2 to 5min > 5min £26.5m £156.2m £35.3m					
Reliability impact on Commuting and Other users		Journey time reliability is expected to improve markedly for users and other travellers in the vicinity.				£194.8m	Not assessed at this stage			
Physical activity		There are several NMU routes that would be severed at the majority of junctions along the A27. However most would be replaced and/or improved, having a neutral effect on physical activity.			£71.8m	Not applicable	£71.8m			
Journey quality		Option 3A is anticipated to improve traveller care through the provision of new traffic signage and advanced directional signage that would be provided and improved. Travellers views are not anticipated to significantly alter with this Option in place. Traveller stress is anticipated to slightly reduce on the whole, whilst new safety related infrastructure such as new lane markings, cats eyes and road studs would be installed.			Not applicable	Neutral	Not applicable			
Accidents		The full accident analysis is reported in A27 Economic Assessment Report which shows that there is expected to be an increase of 5% in accidents across the study area when the improvements of various junction are in place.			Not applicable	Large Beneficial	Not applicable			
Security		Option 3A includes alternative junction layouts at four of the six junction locations and an extra lane between Stockbridge and Bognor Junction on the existing online route of the A27 Chichester Bypass.			-£24.1m	Not applicable	-£24.1m			
Access to services		Accessibility for non-motorised users to local services would change in both a positive and negative way with some existing routes severed whilst new routes would also be created. No services such as churches, schools and hospitals would be demolished or access altered. There are no existing or proposed bus stops on the A27 carriageway however a large number of bus routes utilise the A27 carriageway and its junctions. An increase in journey times is anticipated for bus routes that utilise Whyke and Stockbridge roundabouts and Bognor junction at some times of the day. Buses that currently turn right at Stockbridge and Whyke roundabouts would no longer be able to do so, potentially reducing accessibility. Future provision, routing, frequencies and waiting facilities for buses are currently unknown at this stage of the Scheme.			Not applicable	Slight Beneficial	Not applicable	Not assessed at this stage		
Affordability		Decreases in vehicle operating costs associated with reduced congestion and faster journey times are anticipated however some journeys could become longer in distance resulting in vehicle cost increases.			Not applicable	Not applicable	Not applicable			
Severance		This Option does not include proposed new links or changes to road crossing provision. However traffic modelling results indicate significant increases in vehicle flow along the A27.			Not applicable	Not applicable	Not applicable			
Option and non-use values		Option and non-use values are assessed only for schemes that involve the introduction of a new transport mode, or the removal of an existing one, and are therefore not in the scope of this project.			Not applicable	Not applicable	Not applicable			
Cost to Broad Transport Budget		This Option will require an investment in the transport network of £120.1m PV. Operating and Maintenance costs over 60 years amount to £15.7m PV, giving a total PV of costs of some £135.9m.			£135.9m	Not applicable	£135.9m			
Indirect Tax Revenues		As a result of an increase in operating costs (non-fuel VOC) particularly for other and commuting users, there will be a gain in indirect taxation of £3.5m (PV over 60 years).			£3.5m	Not applicable	£3.5m			