

Appraisal Summary Table

Option: North Fringe to Hengrove Package (Central Case)	Description: Combination of four major projects; three bus-based rapid transit routes between Cribbs Causeway / North Fringe; East Fringe and South Bristol via Bristol City Centre; three new park and ride sites; improvements to Bristol City Centre; and new transport link at Stoke Gifford (Stoke Gifford Transport Link).	Date & Contact: Atkins March 2010

OBJECTIVE	SUB-OBJECTIVE	KEY POINTS	Metrics	Assessment
Tackle Climate Change	Reduce Greenhouse Gas Emissions	Decrease in overall vehicle kilometres per day travelled over the 60 year appraisal period resulting in overall decrease in carbon emissions and a positive net present value (assumes traffic growth stops in 2031; and improvements in emission technology stop in 2025).	Change in emissions in opening year: -382 tonnes; Change in emissions over 60 yr appraisal period: -46,515 tonnes.	Benefit NPV = +£1.88m
Support Economic Growth	Improve Reliability	The provision of dedicated priority measures and segregated infrastructure measures will provide improved reliability for the rapid transit services as well as other bus services using the new infrastructure. Highway reliability improvements of the order of £33.1million.	Not Applicable	Highway reliability benefit NPV = +£33.1m
	Improve Connectivity	Business users experience travel time benefits resulting from the improved journey times provided by the rapid transit (and other highway) improvements.	Not Applicable	Beneficial
	Support the Delivery of Housing	There are no new housing developments which are specifically dependent on the implementation of the NFH Package as a whole. However, the South Gloucestershire Draft Core Strategy (published in March 2010) has identified the Stoke Gifford Transport Link to facilitate proposed new neighbourhood areas in the North Fringe. The transport interventions required to support any individual housing development will be assessed as part of the Authorities standard development control procedures.	Not Applicable	Not Applicable
	Enhance Resilience	As no guidance is yet available to address this sub-objective, no comment is provided at this time.	Not Applicable	Not Applicable
	Wider (Economic) Impacts	In overall terms, the NFH Package is likely to contribute to wider economic impacts by improving access to employment areas in the North Fringe (Aztec West) and Emersons Green East. This is likely to boost the attractiveness of these two development areas for firms to locate and workers to work, and hence agglomeration and labour supply benefits. The impact on the city centre is likely to be limited.	Not Applicable	Beneficial; 60 year appraisal benefits to Wider Impacts is £18.1m
Promote Equality of Opportunity	Improve Accessibility	Although the impact on public transport accessibility of the scheme across the wider sub-region is deemed to be small, the benefits are mainly accrued locally and significant improvements to public transport accessibility are shown for Hengrove Park, Emersons Green East, SPark and UWE.	Not Applicable	Slightly Beneficial
	Improve Affordability	This sub-objective has not been assessed as part of this scheme appraisal. However, it is worth noting that the assumptions for fares policy underlying the modelling and appraisal of the NFH Package is to mirror existing public transport fares.	Not Applicable	Not Applicable
	Reduce Severance	The infrastructure associated with the rapid transit element of the NFH Package is unlikely to have a detrimental impact on severance as the majority of the route will follow existing roads, using on-street infrastructure (i.e. bus lanes, priority at traffic signals). Where a segregated busway is provided, the likely severance effect will be mitigated against by providing parallel pedestrian and cycle facilities, including dedicated crossing points. Significant benefits to pedestrian and cyclists in the city centre through improved streetscape, public realm and provision of significantly enhanced pedestrian and cycle facilities. The ability to integrate the design of the rapid transit proposals within the city centre strategy will reduce the likely level of severance.	Not Applicable	Neutral
	Enhance Regeneration	The NFH Package is likely to improve accessibility from several areas of relatively high employment deprivation to key centres of employment, therefore provide some benefits in terms of this sub-objective.	Not Applicable	Beneficial
	Reduce Regional Economic Imbalance	As the majority of beneficiaries from the NFH Package are from the Bristol area and its surrounding localities, the impact on this sub-objective is deemed to be beneficial.	Not Applicable	Beneficial
Improve Quality of Life & Promote a Healthy Natural Environment	Reduce Exposure to Noise	The most significant increases in noise are expected in the vicinity of the Stoke Gifford Transport Link and in the Hengrove Park areas. Adverse impacts in these areas may be limited with mitigation. Effects in the vicinity of the other scheme elements are negligible or minor. Overall there are more properties predicted to receive a perceptible decrease in noise than a perceptible increase in noise. 34,233 properties considered with 541 perceptible increases in noise and 733 perceptible decreases in noise on opening.	Population annoyed in the design year in reference case = 5079; population annoyed in the design year in do-something = 5114.	35 more people annoyed by noise. NPV = -£0.77m.

	Minimise Impact on Biodiversity	Some loss of green field habitat and limited chance of damage to SCNIs and LNR.	Not Applicable	Slight Adverse
	Minimise Impact on the Water Environment	As well as the local watercourses affected by the scheme, there will be effects on the River Frome, the River Avon and the floodplain. The works are generally considered as minor in nature and the impact of the NFH Package proposals is generally classed as neutral. Without mitigation, however, there would be some negative effects on the River Frome which is declared a "salmonid" water. If appropriate mitigation is proved, the effect of the NFH Package proposals on the water environment will be neutral.	Not Applicable	Neutral
	Minimise Impact on Heritage	The NFH Package proposals pass through areas of known cultural heritage value – Stoke Park, Bristol City Centre, the City Docks and Bedminster are areas of particular high value, which is reflected in the high number of designations (including 283 Listed Buildings, 8 Conservation Areas, and 1 Registered Park and Garden. Overall throughout the whole scheme, the potential impact is likely to result in a negligible negative impact or no change. The notable exception is the proposal for a new bridge over the New Cut, which could have a detrimental impact on the historic character of the City Docks Conservation Area and adjacent Listed Buildings.	Not Applicable	Neutral
	Minimise Impact on Landscape	Some long term impacts on landscape character where new road infrastructure is introduced into existing open farmland. Neutral to slight adverse impacts on visual amenity. Potential short term adverse impacts on landscape character and visual amenity through the loss of existing vegetation and construction activities. Mitigation measures will reduce some impacts to neutral at design year. Some impacts will remain slight adverse.	Not Applicable	Slight Adverse
	Improve Experience of Travel	The NFH Package will increase the transport options available to approximately 18,400 existing households in the Greater Bristol area. Modern vehicle designs with good heating, ventilation, seating, luggage space and ride quality will improve traveller care and the provision of better travel information, including real time public transport information, and improvements in personal security, will reduce stress for travellers. Passengers will also benefit from new and better designed waiting and boarding facilities to and from vehicles, giving a less stressful, smoother journey. The NFH Package will have a beneficial impact on transport passenger interchange since it will facilitate improved interchange by the provision of quality waiting facilities and greatly improved public transport information. Operation and ease of use of the public transport system will be improved by creating new direct journey opportunities with new rapid transit routes as well as providing greater interchange opportunities with the remainder of the public transport network and other modes. New interchanges will be created by the provision of park and ride facilities.	Approximately 18,400 households within 400m of rapid transit stop; Approximately 17,400 passengers using the rapid transit services per day.	Largely beneficial
	Improve the Urban Environment	No long term impact on townscape character. Neutral to slight adverse impacts on visual amenity. Potential short term adverse impacts on townscape character and visual amenity during construction. Mitigation measures will reduce impacts to neutral at design year.	Not Applicable	Slight Adverse
	Improve Access to Leisure	Non-business users experience travel time benefits resulting from the improved journey times provided by the rapid transit (and other highway) improvements.	Not Applicable	Beneficial
Better Safety, Security & Health	Reduce the Risk of Death or Injury	Changing transport mode to rapid transit services will benefit car users who transfer to a safer mode (public transport); car users who continue to use the car but whose accident risk is reduced as a result of reduced road traffic levels; and pedestrians and cyclists who will benefit due to reduced car traffic. Additionally, the scheme is expected to contribute to improved safety for pedestrians as a result of the priority measures and provision of improved access to bus stops and new and improved pedestrian crossing facilities. Cyclists will also benefit from greater segregation from general traffic by being able to use new and improved cycle lanes alongside the rapid transit alignments. The variation in costs of accidents resulting from the introduction of the NFH Package is minimal in terms of scale of overall accident costs. The analysis shows that there will be a saving in accident numbers of 1,518 (or 0.06%) over the 60 year appraisal period balancing against an increase in personal injury accidents of 69 (0.04%).	Not Applicable	Benefit NPV = - £0.73m
	Improve Health through Physical Activity	People switching to from car to public transport (including via park and ride) will achieve the recommended minimum distance/time to obtain significant fitness benefits. In this regard the NFH Package is likely to lead to a positive impact on physical fitness.	Not Applicable	Moderately Beneficial
	Reduce Air Quality Health Costs	Overall slight improvement in air quality. No new exceedences of AQS objectives or EU limit values in 2016 as a result of the scheme. Some improvement and some deterioration in the existing AQMA. No exceedences of the annual average NO ₂ AQS objective at 20m from the road centreline at any location in either the reference case or do-something case in 2016, therefore insignificant in terms of WebTAG for PM ₁₀ . One link within 200m of receptors has an increase in concentration of 1ug/m ³ at 20m, considered significant in terms of WebTAG. Negligible effect on SSSI.	No. of properties with improvement: 18957 (NO ₂); 19420 (PM ₁₀). No. of properties with deterioration: 18974 (NO ₂); 18723 (PM ₁₀). No. of properties with no change: 365 (NO ₂); 153 (PM ₁₀).	Concentrations weighted for exposure: NO ₂ - 1877; PM ₁₀ - 547

	Reduce Vulnerability to Terrorism	As no guidance is yet available to address this sub-objective, no comment is provided at this time.	Not Applicable	Not Applicable
	Reduce Crime	Particular attention and importance is attributed to the personal security of public transport passengers while making their way to and from the stops, waiting for services and travelling on the vehicle. Although security issues have not been considered in detail at this stage in the scheme development, it is anticipated that improvements such as effective CCTV systems; passenger information; good lighting; safe and secure access to stops etc.	Not Applicable	Moderately Beneficial
Impact on Public Accounts	Broad Transport Budget	The public sector experiences costs associated with scheme construction, ongoing maintenance and operation of the scheme and loss in indirect tax revenue.	Local Gov PVC: £81.905m; Central Gov PVC: £138.448m	PVC = £220.353m; NPV = £406.584m; and BCR = 2.85
	Wider Public Finance Impacts	Business and consumer users experience travel time benefits resulting from the reduced journey times provided by the rapid transit services; Transport providers experience ongoing operating costs which are more than offset by increased revenue resulting from additional trips using the rapid transit services.	Business Users PVB: £196.093m; Transport Providers PVB: £37.168m; and Consumer Users PVB: £394.553m	NPV = £406.584m

Appraisal Summary Table

Option: North Fringe to Hengrove Package (Next Best Alternative)	Description: Combination of four major projects; three bus-based rapid transit routes between Cribbs Causeway / North Fringe; East Fringe and South Bristol via Bristol City Centre; three new park and ride sites; improvements to Bristol City Centre; and new transport link at Stoke Gifford (Stoke Gifford Transport Link).	Date & Contact: Atkins March 2010

OBJECTIVE	SUB-OBJECTIVE	KEY POINTS	Metrics	Assessment
Tackle Climate Change	Reduce Greenhouse Gas Emissions	Decrease in overall vehicle kilometres per day travelled over the 60 year appraisal period resulting in overall decrease in carbon emissions and a positive net present value.	Not Applicable	Beneficial
Support Economic Growth	Improve Reliability	The provision of dedicated priority measures and segregated infrastructure measures will provide improved reliability for the rapid transit services as well as other bus services using the new infrastructure.	Not Applicable	Beneficial
	Improve Connectivity	Business users experience travel time benefits resulting from the improved journey times provided by the rapid transit (and other highway) improvements.	Not Applicable	Beneficial
	Support the Delivery of Housing	There are no new housing developments which are specifically dependent on the implementation of the NFH Package as a whole. However, the South Gloucestershire Draft Core Strategy (published in March 2010) has identified the Stoke Gifford Transport Link to facilitate proposed new neighbourhood areas in the North Fringe. The transport interventions required to support any individual housing development will be assessed as part of the Authorities standard development control procedures.	Not Applicable	Not Applicable
	Enhance Resilience	As no guidance is yet available to address this sub-objective, no comment is provided at this time.	Not Applicable	Not Applicable
	Wider (Economic) Impacts	In overall terms, the NFH Package is likely to contribute to wider economic impacts by improving access to employment areas in the North Fringe (Aztec West) and Emersons Green East. This is likely to boost the attractiveness of these two development areas for firms to locate and workers to work, and hence agglomeration and labour supply benefits. The impact on the city centre is likely to be limited.	Not Applicable	Beneficial
Promote Equality of Opportunity	Improve Accessibility	Although the impact on public transport accessibility of the scheme across the wider sub-region is deemed to be small, the benefits are mainly accrued locally and significant improvements to public transport accessibility are shown for Emersons Green East, SPark and UWE. Due to the fact that the route options in South Bristol have changed with NBA, accessibility to Knowle West and Hengrove Park are limited with rapid transit services operating on the periphery of this development / regeneration areas.	Not Applicable	Slightly Beneficial
	Improve Affordability	This sub-objective has not been assessed as part of this scheme appraisal. However, it is worth noting that the assumptions for fares policy underlying the modelling and appraisal of the NFH Package is to mirror existing public transport fares.	Not Applicable	Not Applicable
	Reduce Severance	The infrastructure associated with the rapid transit element of the NFH Package is unlikely to have a detrimental impact on severance as the majority of the route will follow existing roads, using on-street infrastructure (i.e. bus lanes, priority at traffic signals). Where a segregated busway is provided, the likely severance effect will be mitigated against by providing parallel pedestrian and cycle facilities, including dedicated crossing points. Significant benefits to pedestrian and cyclists in the city centre through improved streetscape, public realm and provision of significantly enhanced pedestrian and cycle facilities. The ability to integrate the design of the rapid transit proposals within the city centre strategy will reduce the likely level of severance.	Not Applicable	Neutral
	Enhance Regeneration	The NFH Package is likely to improve accessibility from several areas of relatively high employment deprivation to key centres of employment, therefore provide some benefits in terms of this sub-objective.	Not Applicable	Beneficial
	Reduce Regional Economic Imbalance	As the majority of beneficiaries from the NFH Package are from the Bristol area and its surrounding localities, the impact on this sub-objective is deemed to be beneficial.	Not Applicable	Beneficial
	Improve Quality of Life & Promote a Healthy Natural Environment	Reduce Exposure to Noise	The most significant increases in noise are expected in the vicinity of the Stoke Gifford Transport Link and in the Hengrove Park areas. Adverse impacts in these areas may be limited with mitigation. Effects in the vicinity of the other scheme elements are negligible or minor. Overall there are more properties predicted to receive a perceptible decrease in noise than a perceptible increase in noise. Impact n Hengrove Park likely to be reduced when compared to Central Case as route now runs along Hartcliffe Way instead of through Hengrove Park itself.	Not Applicable

	Minimise Impact on Biodiversity	Some loss of green field habitat and limited chance of damage to SCNIs and LNR.	Not Applicable	Slight Adverse
	Minimise Impact on the Water Environment	As well as the local watercourses affected by the scheme, there will be effects on the River Frome, the River Avon and the floodplain. The works are generally considered as minor in nature and the impact of the NFH Package proposals is generally classed as neutral. Without mitigation, however, there would be some negative effects on the River Frome which is declared a "salmonid" water. If appropriate mitigation is proved, the effect of the NFH Package proposals on the water environment will be neutral.	Not Applicable	Neutral
	Minimise Impact on Heritage	The NFH Package proposals pass through areas of known cultural heritage value – Stoke Park, Bristol City Centre, the City Docks and Bedminster are areas of particular high value, which is reflected in the high number of designations (including 283 Listed Buildings, 8 Conservation Areas, and 1 Registered Park and Garden. Overall throughout the whole scheme, the potential impact is likely to result in a negligible negative impact or no change.	Not Applicable	Neutral
	Minimise Impact on Landscape	Some long term impacts on landscape character where new road infrastructure is introduced into existing open farmland. Neutral to slight adverse impacts on visual amenity. Potential short term adverse impacts on landscape character and visual amenity through the loss of existing vegetation and construction activities. Mitigation measures will reduce some impacts to neutral at design year. Some impacts will remain slight adverse.	Not Applicable	Slight Adverse
	Improve Experience of Travel	The NFH Package will increase the transport options available to approximately 18,400 existing households in the Greater Bristol area. Modern vehicle designs with good heating, ventilation, seating, luggage space and ride quality will improve traveller care and the provision of better travel information, including real time public transport information, and improvements in personal security, will reduce stress for travellers. Passengers will also benefit from new and better designed waiting and boarding facilities to and from vehicles, giving a less stressful, smoother journey. The NFH Package will have a beneficial impact on transport passenger interchange since it will facilitate improved interchange by the provision of quality waiting facilities and greatly improved public transport information. Operation and ease of use of the public transport system will be improved by creating new direct journey opportunities with new rapid transit routes as well as providing greater interchange opportunities with the remainder of the public transport network and other modes. New interchanges will be created by the provision of park and ride facilities.	Over 18,000 households within 400m of rapid transit stop; Approximately 16,500 passengers using the rapid transit services per day.	Largely beneficial
	Improve the Urban Environment	No long term impact on townscape character. Neutral to slight adverse impacts on visual amenity. Potential short term adverse impacts on townscape character and visual amenity during construction. Mitigation measures will reduce impacts to neutral at design year.	Not Applicable	Slight Adverse
	Improve Access to Leisure	Non-business users experience travel time benefits resulting from the improved journey times provided by the rapid transit (and other highway) improvements.	Not Applicable	Beneficial
Better Safety, Security & Health	Reduce the Risk of Death or Injury	Changing transport mode to rapid transit services will benefit car users who transfer to a safer mode (public transport); car users who continue to use the car but whose accident risk is reduced as a result of reduced road traffic levels; and pedestrians and cyclists who will benefit due to reduced car traffic. Additionally, the scheme is expected to contribute to improved safety for pedestrians as a result of the priority measures and provision of improved access to bus stops and new and improved pedestrian crossing facilities. Cyclists will also benefit from greater segregation from general traffic by being able to use new and improved cycle lanes alongside the rapid transit alignments.	Not Applicable	Neutral
	Improve Health through Physical Activity	People switching to from car to public transport (including via park and ride) will achieve the recommended minimum distance/time to obtain significant fitness benefits. In this regard the NFH Package is likely to lead to a positive impact on physical fitness.	Not Applicable	Moderately Beneficial
	Reduce Air Quality Health Costs	Overall slight improvement in air quality. No new exceedences of AQS objectives or EU limit values in 2016 as a result of the scheme. Some improvement and some deterioration in the existing AQMA.	Not Applicable	Slight Beneficial
	Reduce Vulnerability to Terrorism	As no guidance is yet available to address this sub-objective, no comment is provided at this time.	Not Applicable	Not Applicable
	Reduce Crime	Particular attention and importance is attributed to the personal security of public transport passengers while making their way to and from the stops, waiting for services and travelling on the vehicle. Although security issues have not been considered in detail at this stage in the scheme development, it is anticipated that improvements such as effective CCTV systems; passenger information; good lighting; safe and secure access to stops etc.	Not Applicable	Moderately Beneficial

Impact on Public Accounts	Broad Transport Budget	The public sector experiences costs associated with scheme construction, ongoing maintenance and operation of the scheme and loss in indirect tax revenue.	Local Gov PVC: £81.531m; Central Gov PVC: £134.844m	PVC = £216.375m; NPV = £301.737m; and BCR = 2.39
	Wider Public Finance Impacts	Business and consumer users experience travel time benefits resulting from the reduced journey times provided by the rapid transit services; Transport providers experience ongoing operating costs which are more than offset by increased revenue resulting from additional trips using the rapid transit services.	Business Users PVB: £147.864m; Transport Providers PVB: £38.644m; and Consumer Users PVB: £331.803m	NPV = £216.375m

Appraisal Summary Table

Option: North Fringe to Hengrove Package (Lower Cost Alternative)	Description: Combination of four major projects; three bus-based rapid transit routes between Cribbs Causeway / North Fringe; East Fringe and South Bristol via Bristol City Centre; three new park and ride sites; improvements to Bristol City Centre; and new transport link at Stoke Gifford (Stoke Gifford Transport Link).	Date & Contact: Atkins March 2010

OBJECTIVE	SUB-OBJECTIVE	KEY POINTS	Metrics	Assessment
Tackle Climate Change	Reduce Greenhouse Gas Emissions	Decrease in overall vehicle kilometres per day travelled over the 60 year appraisal period resulting in overall decrease in carbon emissions and a positive net present value.	Not Applicable	Beneficial
Support Economic Growth	Improve Reliability	The provision of dedicated priority measures and segregated infrastructure measures will provide improved reliability for the rapid transit services as well as other bus services using the new infrastructure. However, with a substantial reduction in the priority measures provided in South Bristol (compared to the Central Case) journey time improvements are anticipated to much lower in this section.	Not Applicable	Beneficial
	Improve Connectivity	Business users experience travel time benefits resulting from the improved journey times provided by the rapid transit (and other highway) improvements.	Not Applicable	Beneficial
	Support the Delivery of Housing	There are no new housing developments which are specifically dependent on the implementation of the NFH Package as a whole. However, the South Gloucestershire Draft Core Strategy (published in March 2010) has identified the Stoke Gifford Transport Link to facilitate proposed new neighbourhood areas in the North Fringe. The transport interventions required to support any individual housing development will be assessed as part of the Authorities standard development control procedures.	Not Applicable	Not Applicable
	Enhance Resilience	As no guidance is yet available to address this sub-objective, no comment is provided at this time.	Not Applicable	Not Applicable
	Wider (Economic) Impacts	In overall terms, the NFH Package is likely to contribute to wider economic impacts by improving access to employment areas in the North Fringe (Aztec West) and Emersons Green East. This is likely to boost the attractiveness of these two development areas for firms to locate and workers to work, and hence agglomeration and labour supply benefits. The impact on the city centre is likely to be limited.	Not Applicable	Beneficial
Promote Equality of Opportunity	Improve Accessibility	Although the impact on public transport accessibility of the scheme across the wider sub-region is deemed to be small, the benefits are mainly accrued locally and significant improvements to public transport accessibility are shown for Emersons Green East, SPark and UWE. Due to the fact that the route options in South Bristol have changed with LCA, accessibility to Knowle West and Hengrove Park are limited with rapid transit services operating on the periphery of this development / regeneration areas. In addition, the LCA does not serve the Cribbs Causeway Regional Shopping Centre.	Not Applicable	Slightly Beneficial
	Improve Affordability	This sub-objective has not been assessed as part of this scheme appraisal. However, it is worth noting that the assumptions for fares policy underlying the modelling and appraisal of the NFH Package is to mirror existing public transport fares.	Not Applicable	Not Applicable
	Reduce Severance	The infrastructure associated with the rapid transit element of the NFH Package is unlikely to have a detrimental impact on severance as the majority of the route will follow existing roads, using on-street infrastructure (i.e. bus lanes, priority at traffic signals). Where a segregated busway is provided, the likely severance effect will be mitigated against by providing parallel pedestrian and cycle facilities, including dedicated crossing points. Significant benefits to pedestrian and cyclists in the city centre through improved streetscape, public realm and provision of significantly enhanced pedestrian and cycle facilities. The ability to integrate the design of the rapid transit proposals within the city centre strategy will reduce the likely level of severance.	Not Applicable	Neutral
	Enhance Regeneration	The NFH Package is likely to improve accessibility from several areas of relatively high employment deprivation to key centres of employment, therefore provide some benefits in terms of this sub-objective. However, when compared to the Central Case, the impacts in relation to South Bristol - in particular Knowle West Regeneration Area - the impacts are limited as the rapid transit route will only serve the periphery of this area and not run through it as per the Central Case.	Not Applicable	Beneficial
	Reduce Regional Economic Imbalance	As the majority of beneficiaries from the NFH Package are from the Bristol area and its surrounding localities, the impact on this sub-objective is deemed to be beneficial.	Not Applicable	Beneficial

Improve Quality of Life & Promote a Healthy Natural Environment	Reduce Exposure to Noise	The most significant increases in noise are expected in the vicinity of the Stoke Gifford Transport Link and in the Hengrove Park areas. Adverse impacts in these areas may be limited with mitigation. Effects in the vicinity of the other scheme elements are negligible or minor. Overall there are more properties predicted to receive a perceptible decrease in noise than a perceptible increase in noise. Impact n Hengrove Park likely to be reduced when compared to Central Case as route now runs along Hartcliffe Way instead of through Hengrove Park itself.	Not Applicable	Neutral
	Minimise Impact on Biodiversity	Some loss of green field habitat and limited chance of damage to SCNIs and LNR.	Not Applicable	Slight Adverse
	Minimise Impact on the Water Environment	As well as the local watercourses affected by the scheme, there will be effects on the River Frome, the River Avon and the floodplain. The works are generally considered as minor in nature and the impact of the NFH Package proposals is generally classed as neutral. Without mitigation, however, there would be some negative effects on the River Frome which is declared a "salmonid" water. If appropriate mitigation is proved, the effect of the NFH Package proposals on the water environment will be neutral.	Not Applicable	Neutral
	Minimise Impact on Heritage	The NFH Package proposals pass through areas of known cultural heritage value – Stoke Park, Bristol City Centre, the City Docks and Bedminster are areas of particular high value, which is reflected in the high number of designations (including 283 Listed Buildings, 8 Conservation Areas, and 1 Registered Park and Garden. Overall throughout the whole scheme, the potential impact is likely to result in a negligible negative impact or no change.	Not Applicable	Neutral
	Minimise Impact on Landscape	Some long term impacts on landscape character where new road infrastructure is introduced into existing open farmland. Neutral to slight adverse impacts on visual amenity. Potential short term adverse impacts on landscape character and visual amenity through the loss of existing vegetation and construction activities. Mitigation measures will reduce some impacts to neutral at design year. Some impacts will remain slight adverse.	Not Applicable	Slight Adverse
	Improve Experience of Travel	The NFH Package will increase the transport options available to over 16,000 existing households in the Greater Bristol area. Modern vehicle designs with good heating, ventilation, seating, luggage space and ride quality will improve traveller care and the provision of better travel information, including real time public transport information, and improvements in personal security, will reduce stress for travellers. Passengers will also benefit from new and better designed waiting and boarding facilities to and from vehicles, giving a less stressful, smoother journey. The NFH Package will have a beneficial impact on transport passenger interchange since it will facilitate improved interchange by the provision of quality waiting facilities and greatly improved public transport information. Operation and ease of use of the public transport system will be improved by creating new direct journey opportunities with new rapid transit routes as well as providing greater interchange opportunities with the remainder of the public transport network and other modes. New interchanges will be created by the provision of park and ride facilities.	Over 16,000 households within 400m of rapid transit stop; Approximately 13,500 passengers using the rapid transit services per day.	Largely beneficial
	Improve the Urban Environment	No long term impact on townscape character. Neutral to slight adverse impacts on visual amenity. Potential short term adverse impacts on townscape character and visual amenity during construction. Mitigation measures will reduce impacts to neutral at design year.	Not Applicable	Slight Adverse
	Improve Access to Leisure	Non-business users experience travel time benefits resulting from the improved journey times provided by the rapid transit (and other highway) improvements.	Not Applicable	Beneficial
Better Safety, Security & Health	Reduce the Risk of Death or Injury	Changing transport mode to rapid transit services will benefit car users who transfer to a safer mode (public transport); car users who continue to use the car but whose accident risk is reduced as a result of reduced road traffic levels; and pedestrians and cyclists who will benefit due to reduced car traffic. Additionally, the scheme is expected to contribute to improved safety for pedestrians as a result of the priority measures and provision of improved access to bus stops and new and improved pedestrian crossing facilities. Cyclists will also benefit from greater segregation from general traffic by being able to use new and improved cycle lanes alongside the rapid transit alignments.	Not Applicable	Neutral
	Improve Health through Physical Activity	People switching to from car to public transport (including via park and ride) will achieve the recommended minimum distance/time to obtain significant fitness benefits. In this regard the NFH Package is likely to lead to a positive impact on physical fitness.	Not Applicable	Moderately Beneficial
	Reduce Air Quality Health Costs	Overall slight improvement in air quality. No new exceedences of AQS objectives or EU limit values in 2016 as a result of the scheme. Some improvement and some deterioration in the existing AQMA.	Not Applicable	Slight Beneficial
	Reduce Vulnerability to Terrorism	As no guidance is yet available to address this sub-objective, no comment is provided at this time.	Not Applicable	Not Applicable

	Reduce Crime	Particular attention and importance is attributed to the personal security of public transport passengers while making their way to and from the stops, waiting for services and travelling on the vehicle. Although security issues have not been considered in detail at this stage in the scheme development, it is anticipated that improvements such as effective CCTV systems; passenger information; good lighting; safe and secure access to stops etc.	Not Applicable	Moderately Beneficial
Impact on Public Accounts	Broad Transport Budget	The public sector experiences costs associated with scheme construction, ongoing maintenance and operation of the scheme and loss in indirect tax revenue.	Local Gov PVC: £63.527m; Central Gov PVC: £101.402m	PVC = £164.929m; NPV = £195.126m; and BCR = 2.18
	Wider Public Finance Impacts	Business and consumer users experience travel time benefits resulting from the reduced journey times provided by the rapid transit services; Transport providers experience ongoing operating costs which are more than offset by increased revenue resulting from additional trips using the rapid transit services.	Business Users PVB: £122.045m; Transport Providers PVB: £18.084m; and Consumer Users PVB: £269.722m	NPV = £195.126m

Analysis of Monetised Costs and Benefits (Central Case)

Noise	0	
Local Air Quality	0	
Greenhouse Gases	1,603	
Journey Ambience	0	
Accidents	-728	
Consumer Users	394,553	
Business Users and Providers	231,509	
Reliability	0	
Option Values	0	
Present Value of Benefits (see notes) (PVB)	626,937	
Public Accounts	220,353	
Present Value of Costs (see notes) (PVC)	220,353	
OVERALL IMPACTS		
Net Present Value (NPV)	406,584	<i>NPV=PVB-PVC</i>
Benefit to Cost Ratio (BCR)	2.85	<i>BCR=PVB/PVC</i>
<p>Notes : All values in £,000's in 2002 prices and values</p> <p>This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.</p>		

Analysis of Monetised Costs and Benefits (Next Best Alternative)

Noise	0	
Local Air Quality	0	
Greenhouse Gases	1,553	
Journey Ambience	0	
Accidents	1,468	
Consumer Users	331,803	
Business Users and Providers	184,656	
Reliability	0	
Option Values	0	
Present Value of Benefits (see notes) (PVB)	519,480	
Public Accounts	216,431	
Present Value of Costs (see notes) (PVC)	216,431	
OVERALL IMPACTS		
Net Present Value (NPV)	303,049	<i>NPV=PVB-PVC</i>
Benefit to Cost Ratio (BCR)	2.40	<i>BCR=PVB/PVC</i>
<p>Notes : All values in £,000's in 2002 prices and values</p> <p>This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.</p>		

Analysis of Monetised Costs and Benefits (Low cost alternative)

Noise	0	
Local Air Quality	0	
Greenhouse Gases	1,343	
Journey Ambience	0	
Accidents	2,600	
Consumer Users	227,339	
Business Users and Providers	128,674	
Reliability	0	
Option Values	0	
Present Value of Benefits (see notes) (PVB)	359,956	
Public Accounts	164,984	
Present Value of Costs (see notes) (PVC)	164,984	
OVERALL IMPACTS		
Net Present Value (NPV)	194,972	<i>NPV=PVB-PVC</i>
Benefit to Cost Ratio (BCR)	2.18	<i>BCR=PVB/PVC</i>

Notes : All values in £,000's in 2002 prices and values

This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Economic Efficiency of the Transport System (TEE) Central Case

Consumers	ALL MODES	ROAD	BUS & COACH	RAIL	OTHER	
<i>User benefits</i>	TOTAL	Private Cars and LGVs	Passengers	Passengers		
Travel time	380,845	143,543	234,199	3,103	0	
Vehicle operating costs	13,431	13,431			0	
User charges	278	0	0	278	0	
During Construction & Maintenance	0	0	0	0	0	
NET CONSUMER BENEFITS	394,554 (1)	156,974	234,199	3,381	0	
Business						
<i>User benefits</i>		Goods Vehicles	Business Cars & LGVs	Passengers	Freight	Passengers
Travel time	180,772	59,639	73,047	46,249	0	1,837
Vehicle operating costs	15,313	10,673	4,640			
User charges	9	0	0	0	0	9
During Construction & Maintenance	0	0	0	0	0	0
Subtotal	196,094 (2)	70,312	77,687	46,249	0	1,846
<i>Private sector provider impacts</i>						
Revenue	60,017			84,611	0	-24,481
Operating costs	-22,849			-22,849	0	0
Investment costs	0			0	0	0
Grant/subsidy	0			0	0	0
Subtotal	37,168 (3)			61,762	0	-24,481
<i>Other business impacts</i>						
Developer contributions	-1,752	(4)	-1,752	0	0	0
NET BUSINESS IMPACT	231,510 (5) = (2) + (3) + (4)					
TOTAL						
Present Value of Transport Economic Efficiency Benefits	626,064 (6) = (1) + (5)					

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.

All values in £,000's in 2002 prices and values

Economic Efficiency of the Transport System (TEE) Next Best Alternative

Consumers	ALL MODES	ROAD	BUS & COACH	RAIL	OTHER	
<i>User benefits</i>	TOTAL	Private Cars and LGVs	Passengers	Passengers		
Travel time	322,040	109,349	209,747	2,944	0	
Vehicle operating costs	9,483	9,483			0	
User charges	279	0	0	279	0	
During Construction & Maintenance	0	0	0	0	0	
NET CONSUMER BENEFITS	331,802 (1)	118,832	209,747	3,223	0	
Business						
<i>User benefits</i>		Goods Vehicles	Business Cars & LGVs	Passengers	Freight	Passengers
Travel time	134,147	36,379	53,372	42,561	0	1,835
Vehicle operating costs	13,707	10,408	3,299			
User charges	10	0	0	0	0	10
During Construction & Maintenance	0	0	0	0	0	0
Subtotal	147,864 (2)	46,787	56,671	42,561	0	1,845
<i>Private sector provider impacts</i>						
Revenue	55,707			78,101	0	-22,294
Operating costs	-17,162			-17,162	0	0
Investment costs	0			0	0	0
Grant/subsidy	0			0	0	0
Subtotal	38,545 (3)			60,939	0	-22,294
<i>Other business impacts</i>						
Developer contributions	-1,752	(4)	-1,752	0	0	0
NET BUSINESS IMPACT	184,657 (5) = (2) + (3) + (4)					
TOTAL						
Present Value of Transport Economic Efficiency Benefits	516,459 (6) = (1) + (5)					

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.

All values in £,000's in 2002 prices and values

Economic Efficiency of the Transport System (TEE) Low Cost Alternative

Consumers	ALL MODES	ROAD	BUS & COACH	RAIL	OTHER	
<i>User benefits</i>	TOTAL	Private Cars and LGVs	Passengers	Passengers		
Travel time	218,164	81,136	134,683	2,345	0	
Vehicle operating costs	9,265	9,265			0	
User charges	-90	0	0	-90	0	
During Construction & Maintenance	0	0	0	0	0	
NET CONSUMER BENEFITS	227,339 (1)	90,401	134,683	2,255	0	
Business						
<i>User benefits</i>		Goods Vehicles	Business Cars & LGVs	Passengers	Freight	Passengers
Travel time	101,149	27,444	43,082	30,306	0	317
Vehicle operating costs	11,311	8,564	2,747			0
User charges	-21	0	0	0	0	-21
During Construction & Maintenance	0	0	0	0	0	0
Subtotal	112,439 (2)	36,008	45,829	30,306	0	296
<i>Private sector provider impacts</i>						
				Freight	Passengers	
Revenue	30,684			51,574	0	-20,792
Operating costs	-12,698			-12,698	0	0
Investment costs	0			0	0	0
Grant/subsidy	0			0	0	0
Subtotal	17,986 (3)			38,876	0	-20,792
<i>Other business impacts</i>						
Developer contributions	-1,752	(4)	-1,752	0	0	0
NET BUSINESS IMPACT	128,673 (5) = (2) + (3) + (4)					
TOTAL						
Present Value of Transport Economic Efficiency Benefits	356,012 (6) = (1) + (5)					

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.

All values in £,000's in 2002 prices and values

Public Accounts Central Case

	ALL MODES	ROAD	BUS & COACH	RAIL	OTHER
Local Government Funding	TOTAL	INFRASTRUCTURE			
Revenue	64	64			0
Operating Costs	58,858	58,858			0
Investment Costs	24,735	24,735			0
Developer and Other Contributions	-1,752	-1,752	0	0	0
Grant/Subsidy Payments	0	0	0	0	0
NET IMPACT	81,905 (7)	81,905	0	0	0
Central Government Funding					
Revenue	0	0			0
Operating Costs	0	0			0
Investment Costs	119,590	119,590			0
Developer and Other Contributions	0	0	0	0	0
Grant/Subsidy Payments	0	0	0	0	0
Indirect Tax Revenues	18,858	8,704	13,874	-3,720	0
NET IMPACT	138,448 (8)	128,294	13,874	-3,720	0
TOTAL Present Value of Costs (PVC)	220,353 (9) = (7) + (8)				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

All values in £,000's in 2002 prices and values

Public Accounts Next Best Alternative

	ALL MODES	ROAD	BUS & COACH	RAIL	OTHER
Local Government Funding	TOTAL	INFRASTRUCTURE			
Revenue	56	56			0
Operating Costs	58,904	58,904			0
Investment Costs	24,379	24,379			0
Developer and Other Contributions	-1,752	-1,752	0	0	0
Grant/Subsidy Payments	0	0	0	0	0
NET IMPACT	81,587 (7)	81,587	0	0	0
Central Government Funding					
Revenue	0	0			0
Operating Costs	0	0			0
Investment Costs	117,055	117,055			0
Developer and Other Contributions	0	0	0	0	0
Grant/Subsidy Payments	0	0	0	0	0
Indirect Tax Revenues	17,789	8,372	12,805	-3,388	0
NET IMPACT	134,844 (8)	125,427	12,805	-3,388	0
TOTAL Present Value of Costs (PVC)	216,431 (9) = (7) + (8)				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

All values in £,000's in 2002 prices and values

Public Accounts Low Cost Alternative

	ALL MODES	ROAD	BUS & COACH	RAIL	OTHER
Local Government Funding	TOTAL	INFRASTRUCTURE			
Revenue	55	55			0
Operating Costs	48,518	48,518			0
Investment Costs	16,761	16,761			0
Developer and Other Contributions	-1,752	-1,752	0	0	0
Grant/Subsidy Payments	0	0	0	0	0
NET IMPACT	63,582 (7)	63,582	0	0	0
Central Government Funding					
Revenue	0	0			0
Operating Costs	0	0			0
Investment Costs	88,989	88,989			0
Developer and Other Contributions	0	0	0	0	0
Grant/Subsidy Payments	0	0	0	0	0
Indirect Tax Revenues	12,412	7,175	8,382	-3,145	0
NET IMPACT	101,401 (8)	96,164	8,382	-3,145	0
TOTAL Present Value of Costs (PVC)	164,983 (9) = (7) + (8)				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

All values in £,000's in 2002 prices and values

Appraisal Cost Proforma Summary Sheet Central Case

Assumptions:

Price Year Base (Earliest - 1998)	2009
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Note: Promoters are requested to enter the price year base they are using into the above

Investment cost optimism bias (%)	46
Operating cost optimism bias (%)	0

QRA P(80) (total)	23,676
QRA P(50) (total)	15,126
Design Year Operating Cost (usually 15 years from opening year)	4,687
Operating Cost (all years total)	489,437

COST BREAKDOWN:

All values in £,000's (thousands)

Financial Year	Investment Cost (in price year base in cell C3, excluding risk)	Cost including real cost inflation (Base Cost)	Risk adjusted cost using QRA P (mean)	Risk adjusted cost including Optimism Bias	Risk adjusted cost including OB deflated and discounted to 2002 Market Prices
2009/10	1,091	1,091	1,091	1,593	1,032
2010/11	3,819	3,819	3,819	5,575	3,491
2011/12	6,144	6,144	6,144	8,969	5,426
2012/13	8,134	8,134	8,134	11,874	6,941
2013/14	22,097	22,097	23,253	32,258	18,218
2014/15	44,433	44,433	49,431	64,863	35,393
2015/16	43,555	44,954	49,724	65,624	34,597
2016/17	19,927	21,228	23,330	30,988	15,784
2017/18	350	385	385	562	277

Totals for remaining appraisal years:

0	0	0	0	0
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Totals:

149,550	152,285	165,311	222,306	121,159
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Appraisal Cost Proforma Summary Sheet Next Best Alternative

Assumptions:

Price Year Base (Earliest - 1998)	2009
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Note: Promoters are requested to enter the price year base they are using into the above

Investment cost optimism bias (%)	46
Operating cost optimism bias (%)	0

QRA P(80) (total)	23,676
QRA P(50) (total)	15,126
Design Year Operating Cost (usually 15 years from opening year)	4,330
Operating Cost (all years total)	416,252

COST BREAKDOWN:

All values in £,000's (thousands)

Financial Year	Investment Cost (in price year base in cell C3, excluding risk)	Cost including real cost inflation (Base Cost)	Risk adjusted cost using QRA P (mean)	Risk adjusted cost including Optimism Bias	Risk adjusted cost including OB deflated and discounted to 2002 Market Prices
2009/10	1,091	1,091	1,091	1,595	1,034
2010/11	3,819	3,819	3,819	5,583	3,496
2011/12	6,144	6,144	6,144	8,983	5,435
2012/13	8,405	8,405	8,405	12,288	7,183
2013/14	21,549	21,549	22,704	31,504	17,792
2014/15	43,199	43,199	48,196	63,157	34,462
2015/16	42,345	43,706	48,475	63,897	33,687
2016/17	19,379	20,644	22,747	30,182	15,374
2017/18	350	385	385	563	277

Totals for remaining appraisal years:

0	0	0	0	0
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Totals:

146,281	148,942	161,966	217,752	118,740
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Appraisal Cost Proforma Summary Sheet Low Cost Alternative

Assumptions:

Price Year Base (Earliest - 1998)	2009
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Note: Promoters are requested to enter the price year base they are using into the above

Investment cost optimism bias (%)	46
Operating cost optimism bias (%)	0

QRA P(80) (total)	16,337
QRA P(50) (total)	10,437
Design Year Operating Cost (usually 15 years from opening year)	2,822
Operating Cost (all years total)	282,898

COST BREAKDOWN:

All values in £,000's (thousands)

Financial Year	Investment Cost (in price year base in cell C3, excluding risk)	Cost including real cost inflation (Base Cost)	Risk adjusted cost using QRA P (mean)	Risk adjusted cost including Optimism Bias	Risk adjusted cost including OB deflated and discounted to 2002 Market Prices
2009/10	1,091	1,091	1,091	1,590	1,030
2010/11	3,819	3,819	3,819	5,567	3,486
2011/12	6,144	6,144	6,144	8,955	5,418
2012/13	2,295	2,295	2,295	3,345	1,955
2013/14	20,367	20,367	21,165	29,687	16,766
2014/15	31,155	31,155	34,603	45,411	24,779
2015/16	30,192	31,162	34,453	45,421	23,946
2016/17	13,877	14,783	16,234	21,548	10,976
2017/18	350	385	385	561	276

Totals for remaining appraisal years:

0	0	0	0	0
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Totals:

109,290	111,201	120,189	162,085	88,632
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BEFORE and AFTER IMPLEMENTATION COMPARISONS CENTRAL CASE

This should be populated with estimates from the local transport model for the approval stage being bid for and any earlier approval stages.

	Before Implementation			Post - Implementation
	Programme Entry	Conditional Approval	Full Approval	
Capital Cost (£000)	149,550			
Annual Operating Cost (£000)	1,275			
Annual Maintenance Cost (£000)	600			
Annual Revenue (£000)	2,028			
Annual Passenger/Vehicle Trips (m)	534			
Annual Passenger/Vehicle Km (m)	62			
Congestion Benefits (£000)	590,360			
Mode Shift (%)	3			

BEFORE and AFTER IMPLEMENTATION COMPARISONS Next Best Alternative

This should be populated with estimates from the local transport model for the approval stage being bid for and any earlier approval stages.

	Before Implementation			Post - Implementation
	Programme Entry	Conditional Approval	Full Approval	
Capital Cost (£000)	141,434			
Annual Operating Cost (£000)	1,123			
Annual Maintenance Cost (£000)	600			
Annual Revenue (£000)	1,898			
Annual Passenger/Vehicle Trips (m)	405			
Annual Passenger/Vehicle Km (m)	62			
Congestion Benefits (£000)	479,377			
Mode Shift (%)	3			

BEFORE and AFTER IMPLEMENTATION COMPARISONS Low Cost Alternative

This should be populated with estimates from the local transport model for the approval stage being bid for and any earlier approval stages.

	Before Implementation			Post - Implementation
	Programme Entry	Conditional Approval	Full Approval	
Capital Cost (£000)	105,750			
Annual Operating Cost (£000)	737			
Annual Maintenance Cost (£000)	535			
Annual Revenue (£000)	960			
Annual Passenger/Vehicle Trips (m)	404			
Annual Passenger/Vehicle Km (m)	62			
Congestion Benefits (£000)	339,890			
Mode Shift (%)	1			