Agenda Item:

Meeting of:	**Environment and Regeneration Scrutiny Committee**
Date of Meeting:	**Wednesday, 16 October 2019**
Relevant Scrutiny Committee:	Environment and Regeneration
Report Title:	Penarth to Cardiff Barrage Sustainable Transport Corridor WelTAG Stage Two
Purpose of Report:	To update Committee on progress with the WelTAG Stage Two Penarth to Cardiff Barrage Sustainable Transport Corridor Study and make recommendations for the next steps to be considered as part of a Stage Three assessment.
Report Owner:	Head of Neighbourhood Services and Transport
Responsible Officer:	Miles Punter Director of Environment and Housing Services
Elected Member and Officer Consultation:	Cabinet Member for Neighbourhood Services and Transport Cabinet Member for Regeneration and Planning Group Manager Transport Services Passenger Transport Manager Operational Manager Engineering Accountant Environment and Housing Services Operational Manager Finance Head of Regeneration and Planning Legal Services (Committee Reports) Major Project Manager Operational Manager Development Management
Policy Framework:	This report is a matter for Executive decision by Cabinet

Agenda Item:

Executive Summary:

- This Report provides an update on progress of the Penarth to Cardiff Barrage Sustainable Transport Corridor WelTAG Stage Two study.
- Following completion of WelTAG Stage One (May 2019), three options were approved for further consideration as part of a WelTAG Stage Two appraisal, encompassing:

  OPTION 1: Active Travel proposals for the Penarth to Cardiff Barrage Corridor

  OPTION 2: Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage

  OPTION 3: Cogan Multi-Modal Sustainable Transport Interchange

- Following completion of the WelTAG Stage Two appraisal and the project's Review Group meeting held on Tuesday 24th September 2019, the output of the WelTAG Stage Two study recommends the following:

That OPTION 1 is progressed for further appraisal at WelTAG Stage Three. The WelTAG Stage Three appraisal should consider the potential transport benefits of all active travel measures included within the WelTAG Stage Two Outline Business Case report as part of a single option, with an additional recommendation to take forward the Penarth Headland Link (PHL) as part of a separate implementation programme to the other active travel measures (those measures other than PHL) due to the complexity and large-scale context of the PHL proposal, as well as to allow the PHL appraisal to more widely reflect its potential leisure and tourism benefits.
That OPTION 2 is not progressed for further appraisal at WelTAG Stage Three.
That OPTION 3 is progressed for further appraisal at WelTAG Stage Three, and that a partnership approach between Transport for Wales and Vale of Glamorgan Council provides the framework to take forward the appraisal.

Due to its size, physical copies of Appendix B are available on request from Democratic Services.

Recommendations

1. THAT Committee notes the progress made on the Penarth to Cardiff Barrage Sustainable Transport Corridor WelTAG Stage Two Study relating to improving sustainable connectivity through the corridor between Penarth and Cardiff Barrage.
2. THAT Committee supports the progression of the recommended options (Options 1 and 3) outlined within the Penarth to Cardiff Barrage Sustainable Transport Corridor WelTAG Stage Two study.
3. THAT the comments of this Scrutiny Committee on the 3 options are referred to Cabinet for their consideration.

Reasons for Recommendations

1. To update Committee on progress made on the scheme.
2. To support progression of the Study and specific options to WelTAG Stage Three in principle.
3. To ensure the comments of Scrutiny Committee are considered before a decision of the matter is made by Cabinet.

1. Background

1.1 Capita has been commissioned to complete a WelTAG Stage One and Stage Two studies to develop and appraise options for improving sustainable transport between Penarth and Cardiff barrage. The appraisal of options is being undertaken in line with the Welsh Transport Appraisal Guidance (WelTAG 2017) including advice on the appraisal in relation to the Future Generations of Wales (2015) Act Well-being Goals.

1.2 The WelTAG Stage One Strategic Outline Case and accompanying Impacts Assessment Report was completed in May 2019. Of the five options assessed at Stage One, three options were recommended to be taken forward for WelTAG Stage Two appraisal namely:

OPTION 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM

OPTION 2 - Bus Park & Ride and sustainable transport links across Cardiff Barrage

OPTION 3 - Multi-modal sustainable transport interchange

1.3 The WelTAG Stage One recommendations were subsequently endorsed at the Cabinet meeting of 15th July 2019.

1.4 The WelTAG Stage Two assessment has since been taken forward and completed in draft by Capita, appraising each of the three options in relation to the WelTAG Five Case Business Model (the strategic, transport, management, financial and commercial cases). The overarching objectives of WelTAG Stage Two are to:

- Identify effectiveness of each short-listed option in meeting the scheme objectives.
- Identify likely impacts of each option and contribution to well-being goals.
- Selection of preferred option to take forward to next Stage.
- Agree methodology for any additional impact assessment work required in next Stage.

1.5 The WelTAG Stage Two report (Appendix A refers) is accompanied by the Impact Assessment Report (IAR) (Appendix B refers). Its purpose is to provide a record of the appraisal work on the proposed transport intervention and contains the detailed evidence behind the summary of information provided to decision makers in the Stage reports. The IAR remains a live document for updating throughout the process.

1.6 To support development of the WelTAG Stage Two process, a Stakeholder workshop was held on 22 May 2019 (14:00 – 16:00 Penarth Pier Pavilion), followed by a public consultation event on 19 June 2019 (13:00 – 19:00 Paget Rooms Penarth) with around 100 members of the public attending the event.

1.7 A six-week public consultation period followed between Wednesday 19th June 2019 and Sunday 4th August 2019 with output from the two events and subsequent public consultation period captured within an associated WelTAG Stage Two Consultation Report (Penarth to Cardiff Barrage Sustainable Transport Corridor Study WelTAG Stage Two - Draft Impact Assessment Report, Appendix B to this Report in Appendix 17).

1.8 The aim of the engagement events was to gain opinion on the shortlisted options in terms of advantages and disadvantages, any constraints or dependencies or risks to implementation. Both events also allowed for general feedback to be gained on the WelTAG study being undertaken.

1.9 Following submission of the first draft reports, the project's WelTAG Stage Two Review Group meeting was held on Tuesday 24th September 2019 to discuss and agree the output and proposed recommendations stemming from the study. A draft Agreed Outcomes report and updated terms of reference form the key output deliverables from the meeting (Appendix C refers).

2. Key Issues for Consideration

2.1 The problems have been identified as follows:

PROBLEMS
Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution.
Volume of traffic is a barrier to walking and cycling.
High levels of car use and low levels of public transport use.
Sustainable transport options not an attractive alternative to car travel.
Unreliable and slow journey times of bus services.
Lack of park and ride facilities limits opportunities for public transport interchange.
Low levels of Active Travel.
Safety issues act as a barrier to walking and cycling.
Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes.
Lack of facilities for cyclists at trip origin and destination.
Environmental factors reduce the attractiveness of walking and cycling.
Topography of the area acts as a barrier to walking and cycling.
Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth.
Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.

2.2 The objectives set for the study in order to address the problems, opportunities and constraints are as set out below.

OBJECTIVES
Enhance sustainable connectivity throughout the Penarth to Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.
Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.
Increase sustainable transport options that improve accessibility along the Penarth to Cardiff Barrage transport corridor and support social inclusion, health and well-being.
Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.
Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.

2.3 The three short-listed options that were taken forward for appraisal at WelTAG Stage Two are:

OPTION 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM

OPTION 2 -Bus Park & Ride and sustainable transport links across Cardiff Barrage

OPTION 3 - Multi-modal sustainable transport interchange

2.4 The WelTAG Stage Two assessment has subsequently appraised each of the options in relation to the WelTAG Five Case Business Model, encompassing the:

- Strategic Case
- Transport Case
- Management Case
- Financial Case
- Commercial Case

OPTION 1

2.5 Following the WelTAG Stage Two appraisal work that has been undertaken and the feedback from the stakeholder and public consultation exercises, it is recommended that the network of Active Travel links within OPTION 1 be taken forward to WelTAG Stage Three for further development and analysis.

2.6 This option performed most positively of all the options throughout the Strategic Case appraisal and was the most well-supported of the three options receiving the most positive responses during the WelTAG Stage Two consultation activities. The Transport Case economic assessment of OPTION 1 produced a Benefit Cost Ratio (BCR) range of 1.25 to 3.86, which represents BCR values ranging from low to high value for money. The level of value for money is affected greatly by the cost associated with the Penarth Headland Link (PHL) and potential wider impacts such as tourism benefits. The BCR range reflects the PHL scenarios considered by the economic assessment of OPTION 1 (i.e. scenarios that take account of the lower and higher cost estimates currently available for the PHL, the inclusion of wider economic benefits in an adjusted BCR and a sensitivity test to take account of a potentially lower usage of the PHL). Further development of the PHL proposal will enable the BCR to be revisited and refined. OPTION 1 scored most positively of the three options against the economic, environmental, social and cultural criteria in the Transport Case appraisal.

2.7 A further recommendation in relation to OPTION 1 is that separate implementation plans should be developed for the PHL proposal and for the other Active Travel proposals within OPTION 1. The reasons for recommending a separate implementation plan for the PHL proposal are as follows:

- The different development requirements of the PHL and the wider Active Travel proposals within OPTION 1 have been highlighted throughout the WelTAG Stage Two work. This is largely due to the scale of the PHL and the nature of the proposal. For example, the extent of development work needed for the PHL will be sufficiently greater, more wide-ranging and require longer timescales than that needed for the smaller-scale Active Travel proposals across the rest of the network.

- A point that has been highlighted by the economic assessment undertaken for WelTAG Stage Two, which will be important in the further development of the scheme, is that the PHL proposal cannot be justified solely on its transport-related benefits. The majority of economic benefits of the PHL are derived from physical benefits experienced by leisure and recreational users of the PHL and wider economic benefits (e.g. in relation to leisure and tourism). It is therefore recommended that the PHL proposal should not be progressed solely as a transport scheme but that its business case should be developed more widely to reflect its potential wider leisure and tourism benefits. The funding package for the scheme should similarly aim to identify funding sources that are reflective of these wider benefits of the scheme.

2.8 Due to these factors and due to the complex and large-scale nature of the PHL proposal, it is recommended that the implementation plan for the PHL should be progressed separately to the other Active Travel proposals within OPTION 1. The package of Active Travel proposals within OPTION 1 (other than the PHL) are hereafter referred to as the Penarth Active Travel Network for ease of reference.

2.9 It is recommended that the future development of the Penarth Active Travel Network should consider feedback from the WelTAG Stage Two stakeholder and public consultation. A key point raised through the consultation activities is that the current proposals for Active Travel improvements across the network should be more ambitious. The proposals are based on the existing INM alignments and identify improvements within the constraints of the existing highway network. However, feedback from the stakeholder and public consultation highlighted that the proposals should identify more ambitious improvements for Active Travel. This also reflects Welsh Government aspirations to fund 'ambitious Active Travel schemes that have the potential to transform walking and cycling. It is therefore recommended that the future development of the Penarth Active Travel Network should consider options beyond the current INM network and consider wider links (e.g. to schools or to proposed bike hire locations). More substantial changes to the highway network to prioritise pedestrians and cyclists should be considered in the development of the network, which would potentially have a greater impact on increasing levels of Active Travel and in releasing latent demand for journeys by walking and cycling.

OPTION 2

2.10 As a result of the WelTAG Stage Two work that has been undertaken and the feedback from the stakeholder and public consultation exercises, it is recommended that OPTION 2 should not be taken forward to WelTAG Stage Three at this stage.

2.11 In terms of the Strategic Case appraisal, OPTION 2 received the most negative responses during the WelTAG Stage Two consultation activities, particularly in relation to the potential impact that the introduction of buses on Cardiff Barrage

could have on the existing Active Travel route. The Transport Case economic assessment of OPTION 2 produced a BCR of 0.25, which represents poor value for money. This is due to the significant funding required to subsidise the Park and Ride bus service, the limited transport demand for the service and the low level of benefits produced. Overall, OPTION 2 scored the least positively of the three options against the economic, environmental, social and cultural criteria in the Transport Case appraisal.

2.12 The WelTAG Stage Two assessment of OPTION 2 has highlighted key factors that will reduce the attractiveness of the bus park and ride proposal:

- The location of the bus park and ride facility will impact on usage levels of the facility, as it is located away from the main A4055 highway network and will require drivers to divert some distance from their existing route to use the facility.

- The location of the park and ride to the south of Penarth is likely to attract a relatively limited catchment. It would mainly attract users from the Lower Penarth, Sully and Cosmeston areas and not attract users from Penarth itself or from areas further afield such as Barry. Issues relating to the proposed location of the park and ride was a common theme raised through the stakeholder and public consultation.

- A further issue is the proposed bus route between the park and ride and the barrage. The existing highway network through Penarth is constrained due to on-street parking and the highway space available, particularly at key junctions along the route, which limits the scope of any bus priority measures that could be implemented and subsequent journey time savings.

- The operational nature of the barrage limits the frequency of the bus service that can be provided, which will reduce the attractiveness of the park and ride as a 'turn up and go' travel option.

- It is likely that the park and ride bus service would require ongoing revenue support and that this would be better spent improving existing bus services or pump priming the existing network.

2.13 It should be noted that many concerns were raised at both the stakeholder workshop and through the public consultation about the impact of the proposal on the existing walking and cycling environment of the barrage. Many comments were received about the importance of the 'traffic-free' nature of the barrage, that it should be kept as a core and 'flagship' Active Travel route and the impact that the introduction of buses onto the barrage would have on the perceived (and actual) safety of the route to pedestrians and cyclists. The potential for public opposition to the introduction of buses onto Cardiff Barrage is considered a key risk to OPTION 2.

2.14 It is acknowledged that Cardiff Council may continue to be interested in the development of a bus route over Cardiff Barrage linking Penarth and Cardiff without the wider park and ride element. It is further acknowledged that this WelTAG Stage Two study has focused on OPTION 2 as a whole and has not considered the benefits of stand-alone elements of the wider proposal. However, it is recommended that any future development of this proposal by Cardiff Council should be mindful of the views expressed during the WelTAG Stage Two stakeholder and public consultation. The design of any future proposal for Cardiff Barrage would need to carefully consider the impact on the existing Active Travel environment to ensure conflict between pedestrians, cyclists and vehicles and any negative impacts of the introduction of buses onto the barrage are minimised.

2.15 This WelTAG Stage Two Report recommends that the proposal for a bus park and ride facility at Cosmeston Lakes Country Park is not taken forward to WelTAG Stage Three at this stage. However, it is acknowledged that the provision of a park and ride facility or wider transport interchange at a location in the eastern Vale of Glamorgan area remains an aspiration in order to reduce car use for journeys to and from Cardiff (e.g. commuting journeys from Barry). It is likely that a future strategic review will be needed of all potential locations for such a facility in order to analyse demand and take account of changing circumstances (e.g. longer-term development proposals). Any future work that is undertaken to establish the most appropriate and feasible location for a facility will need to be fully integrated with wider developments taking place across the area (e.g. proposed housing developments at Cosmeston and future Metro proposals for the transport corridor). The work will also need to inform the LDP review process, due to the proposal for a bus park and ride at Cosmeston being a policy within the Vale of Glamorgan Council's LDP.

OPTION 3

2.16 As a result of the WelTAG Stage Two work that has been undertaken and the feedback from the stakeholder and public consultation exercises, it is recommended that the Cogan Multi-Modal Interchange proposal (OPTION 3) be further developed with the intention of taking the scheme forward to WelTAG Stage Three. It is recommended that a partnership approach between Transport for Wales and Vale of Glamorgan Council is essential to take forward the work on OPTION 3. The involvement of Transport for Wales will ensure planned rail improvements and wider proposals for the rail network are fully incorporated into the development of the proposal. The involvement of Vale of Glamorgan Council will ensure that wider considerations, such as those relating to Active Travel and the local highway network, form a key part of the proposals that are progressed. Close collaboration will be essential to ensure all of these elements and priorities are fully considered when developing the proposals.

2.17 This Option performed well in the Strategic Case appraisal and recorded a positive or neutral impact throughout the appraisal. Responses received through

the WelTAG Stage Two consultation in relation to OPTION 3 were mixed, which could reflect the variety of improvements proposed by OPTION 3. For example, positive comments were received in relation to the proposed Active Travel and accessibility improvements, with more negative comments received in relation to the potential impact on traffic levels and congestion. The Transport Case economic assessment of OPTION 3 produced a BCR of 3.06, which represents high value for money. This is mainly due to the significant vehicle operating cost and parking charge savings gained by users transferring from the car to train. OPTION 3 performed well in the Transport Case appraisal, with no negative ratings against any of the economic, environmental, social or cultural criteria.

2.18 It is considered that the development of the scheme is at too early a stage to enable the full benefits and costs of the proposal to be fully understood. It is recommended that OPTION 3 requires more feasibility work and should be taken forward to the next WelTAG stage to enable the proposal to be further developed. This will enable detailed consideration to be given to the concerns raised during the stakeholder workshop and public consultation. It is recommended that the additional feasibility work be completed in the first instance and the business case reviewed to ensure it is still positive, prior to a WelTAG Stage Three report being progressed. This feasibility work should confirm the elements of the scheme that will be taken forward and also develop a better understanding of user needs and the demand for the scheme elements. This will ensure that a final preferred option for the scheme is available prior to the WelTAG Stage Three report being progressed.

2.19 A specific concern raised through the stakeholder and public consultation was the potential impact of the proposal on the local highway network, which already experiences problems of congestion (e.g. along Windsor Road, at Cogan Hill roundabout and Barons Court junction, which are all in close proximity to Cogan Station). The development of the scheme should incorporate any highway improvements considered necessary to accommodate the additional traffic (e.g. consider the feasibility of improving Cogan Hill roundabout). The traffic impact of the proposal on the local highway network will need to be a key consideration in the development of OPTION 3 and will need to be considered in the context of wider proposed developments in the area (e.g. the proposed Wellbeing Hub at Penarth Leisure Centre). As with all options, it is important that OPTION 3 is not developed in isolation and should take account of its wider context. For example, consideration should be given to other stations in the area in terms of planned, future and potential improvements.

2.20 It is recommended that the development of OPTION 3 strongly focuses on improving Active Travel links to the station from all areas. This point was raised repeatedly through the public consultation such as the need to improve links to Cogan Station from (e.g. Pont-y-Werin and Penarth Marina including the crossing of Cogan Hill, Llandough and routes to the west of the station). Although the cost estimate developed for this WelTAG Stage Two study does include Active Travel improvements, it is recommended that the emphasis on Active Travel be

extended in the further development of the scheme and that it should become a key part of the overall proposal. In addition, the future development of the Cogan Interchange proposal should be mindful of associated Active Travel improvements identified in OPTION 1.

CONCLUSION

2.21 Following completion of the WelTAG Stage Two appraisal and the project's Review Group meeting held on Tuesday 24 September 2019, the output of the Study recommends the following:

That OPTION 1 be progressed for further appraisal at WelTAG Stage Three, and that the WelTAG Stage Three appraisal should consider the potential transport benefits of all active travel measures included within the WelTAG Stage Two Outline Business Case report as part of a single option, with an additional recommendation to take forward the Penarth Headland Link (PHL) as part of a separate implementation programme to the other active travel measures (those measures other than PHL) due to the complexity and large-scale context of the PHL proposal, as well as to allow the PHL appraisal to more widely reflect its potential leisure and tourism benefits.
That OPTION 2 is not progressed for further appraisal at WelTAG Stage Three.
That OPTION 3 be progressed for further appraisal at WelTAG Stage Three, and that a partnership approach between Transport for Wales and Vale of Glamorgan Council provides the framework to take forward the appraisal.

3. How do proposals evidence the Five Ways of Working and contribute to our Well-being Objectives?

3.1 The principles behind the Well-being of Future Generations (Wales) Act 2015 are embedded within the WelTAG process and have been an integral part of the development of the WelTAG Stage One and Stage Two reports.

3.2 The Act identifies seven well-being goals that public bodies must work to achieve and five ways of working that public bodies need to apply when making their decisions (collaboration, integration, involvement, long-term, prevention).

3.3 A summary has been produced of how the five ways of working have been considered and applied throughout WelTAG Stages One and Two and is included within Appendix 3 of the IAR. This outlines the well-being considerations in undertaking the WelTAG process to date, but also recognises the ongoing importance of the five ways of working in the further development of options and the later WelTAG stages.

3.4 The well-being goals of the Well-being of Future Generations (Wales) Act 2015 have been central to the WelTAG process. For example, in WelTAG Stage One,

the well-being goals and five ways of working were integral to the identification of problems, the development of study-specific objectives and the assessment of potential options. Each were assessed in terms of their potential to impact on or contribute to each of the national well-being goals. The WelTAG Stage Two option appraisal process has involved a more detailed assessment of the impacts of each option in relation to national well-being goals and the well-being objectives of relevant national and local public bodies, including the Welsh Government, the Vale of Glamorgan's Public Services Board and the Vale of Glamorgan Council.

3.5 Consultation with stakeholders and the public has played a key part in the WelTAG process. This links closely to the importance of collaboration and involvement, which feature within the five ways of working of the Well-being of Future Generations (Wales) Act 2015.

3.6 WelTAG Stage Two Option Appraisal Tables Impacts Assessment Report Appendix 18. The WelTAG Stage Two study has completed extensive appraisal of the options against the:

- Well-being of Future Generations (Wales) Act 2015 Goals
- Wales Transport Strategy Outcomes
- Welsh Government's Well-being Objectives
- Local & Regional Policy Appraisal (Part 1 - Vale of Glamorgan Local Transport Plan)
- Local & Regional Policy Appraisal (Part 2 - Cardiff Capital Region Strategic Objectives)
- WelTAG Stage Two Scheme Objectives
- Identified Problems

3.7 WelTAG Stage Two | Well-being Assessment Tables Impacts Assessment Report Appendix 19. In addition, the WelTAG Stage Two study has considered the impacts of each shortlisted option in relation to the well-being goals and objectives of a range of public bodies (the appraisal has provided supporting information to the well-being Strategic Case appraisal included in Appendix 18 of the IAR), encompassing the:

- Well-being Goals of the Well-being of Future Generations (Wales) Act 2015
- Welsh Government's Well-being Objectives as outlined in 'Prosperity for All: The National Strategy'
- Vale of Glamorgan Council and Vale of Glamorgan's Public Services Board Well-being Objectives.

3.8 Each of the five objectives have been subject to consideration against the Five Ways of Working (collaboration, integration, involvement, long-term, prevention). Each of the objectives are subsequently considered to align with each element of the Five Ways of working with full details provided within the WelTAG Stage One report.

4. Resources and Legal Considerations

Financial

4.1 The study has been financed by Welsh Government Capital Transport Grant funding.

4.2 The WelTAG Stage One value is £34,802.00 (excluding VAT). The WelTAG Stage Two value is £34,700.00 (excluding VAT). The total value for the WelTAG Stage One and Stage Two studies is £69,502.00 (excluding VAT). A single Project Change Notification was approved to the value of £3,208.00 (excluding VAT) to cover the additional cost of Capita undertaking the production of a second consultation report as part of WelTAG Stage Two.

4.3 Arcadis Consulting (UK) Ltd were previously commissioned by Vale of Glamorgan Council to provide WelTAG Stage One and Stage Two Project Management Services on behalf of the Council to the total value of £25,605.20 (excluding VAT). For services through November 2018 to June 2019 inclusive). This contract is now complete.

4.4 Arcadis Consulting (UK) Ltd are have been further commissioned by Vale of Glamorgan Council to provide ongoing WelTAG Stage Two and future Stage Three Project Management Services on behalf of the Council to the value of £42,518.63 (excluding VAT). For services through July 2019 to May 2020 inclusive. This contract is currently ongoing.

Employment

4.5 Consultants Capita have been commissioned to undertake the technical work on this Project because there is not spare resource available within the Council.

4.6 Consultants Arcadis have been commissioned to provide Project Management Services on this Project to support the Council's in delivery of this Study.

Legal (Including Equalities)

4.7 The appraisal of options has been undertaken in accordance with Welsh Government's latest version of WelTAG (December 2017) including advise on the appraisal in relation to the Well-being goals set out in the Well-being of the Future Generations (Wales) Act 2015.

4.8 The Vale of Glamorgan Local Development Plan (2017) was adopted by the Council on the 28th June 2017, which sets out the vision, objectives, strategy and policies for managing development in the Vale of Glamorgan. It also seeks to identify the infrastructure that will be required to meet anticipated growth in the Vale of Glamorgan area up to 2026. The LDP states that priority will be given to schemes that improve highway safety, accessibility, public transport, walking and

cycling. The LDP's of the neighbouring Authorities of Bridgend, Cardiff and Rhondda Cynon Taff have also been noted.

4.9 The Vale of Glamorgan Local Transport Plan (2015) acknowledges the requirement for a collaborative approach for the future development of the Capital Region. The LTP seeks to identify the sustainable transport measures required to ensure Vale of Glamorgan Council adheres to current requirements and good practice, to allow for a sustainable transport environment for the period 2015 to 2020, as well as looking forward to 2030. The plan therefore seeks to secure better conditions for pedestrians, cyclists and public transport users and to encourage a modal shift away from the single occupancy car. The LTP also 'seeks to tackle traffic congestion by securing improvements to the strategic highway corridors for commuters who may need to travel by car'.

4.10 The provision of a well organised transport network helps to increase mobility and accessibility.

5. Background Papers

Appendix A - Penarth to Cardiff Barrage Sustainable Transport Corridor Study | WelTAG Stage Two Draft Report SEPTEMBER 2019

Appendix B - Penarth to Cardiff Barrage Sustainable Transport Corridor Study | WelTAG Stage Two Draft Impact Assessment Report SEPTEMBER 2019

Appendix C - Penarth to Cardiff Barrage Sustainable Transport Corridor Study Review Group Meeting Minutes 24th SEPTEMBER 2019

CAPITA

Penarth to Cardiff Barrage Sustainable Transport Corridor Study

WelTAG Stage Two - Draft Report

October 2019

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Project No: CS/096888 Doc Ref: CS/096888 - Draft Rev: P03

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Issue Date: October 2019

Penarth to Cardiff Barrage Sustainable Transport Corridor Study
WelTAG Stage Two - Draft Report

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CAPITA

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Capita understands and acknowledges the Authority's legal obligations and responsibilities under the Freedom of Information Act 2000 (the "Act") and fully appreciates that the Authority may be required under the terms of the Act to disclose any information which it holds. Capita maintains that the report contains commercially sensitive information that could be prejudicial to the commercial interests of the parties. On this basis Capita believes that the report should attract exemption from disclosure, at least in the first instance, under Sections 41 and/or 43 of the Act. Capita accepts that the damage which it would suffer in the event of disclosure of certain of the confidential information would, to some extent, reduce with the passage of time and therefore proposes that any disclosure (pursuant to the Act) of the confidential information contained in the report should be restricted until after the expiry of 24 months from the date of the report.

Glossary of Terms

AMCB	Analysis of Monetised Costs and Benefits
AQMA	Air Quality Management Area
BCR	Benefit – Cost Ratio
CPA	Coast Protection Act
EIA	Environmental Impact Assessment
GRIP	Governance for Railway Investment Projects
HEAT	Health Economic Assessment Tool
HR	Human Resources
IAR	Impact Assessment Report
INM	Integrated Network Map
LDP	Local Development Plan
NPV	Net Present Value
NTEM	National Trip End Model
NYA	Not Yet Assessed
PHL	Penarth Headland Link
RUIS	Route User Intercept Survey
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SUDs	Sustainable Drainage Systems
TEE	Transport Economic Efficient
TRO	Traffic Regulation Order
TUPE	Transfer of Undertakings (Protection of Employment)
WBOFGA	Well-Being of Future Generations Act
WelTAG	Welsh Transport Appraisal Guidance

Contents

Supporting Information

1. Introduction

1.1 Background and Study Context

The need to consider options for improving connectivity, by sustainable transport along the Penarth to Cardiff Barrage Corridor, has been identified by the Vale of Glamorgan's Local Development Plan (LDP) (2017), which includes a policy to deliver sustainable transport improvements along the corridor between Penarth and Cardiff. The LDP also sets an objective that Penarth be promoted as a 'sustainable transport town' by implementing measures that improve connectivity within the town and 'to adjoining residential and commercial areas, including Cardiff Bay'[1].

The proximity of Penarth to Cardiff presents both challenges and opportunities in terms of connectivity and accessibility. The Vale of Glamorgan Public Services Board Well-being Assessment 2017[2] states that the 'Vale's location could be considered one of its greatest assets in maximising the economic well-being of our residents and the area' and the LDP highlights the proximity to Cardiff as a key factor in terms of employment. However, the location of the Vale is also a key factor in the area having the highest rate of out-commuting in Wales, the majority of which is commuting into Cardiff. These high levels of out commuting result in peak time congestion on the main distributor roads in the eastern Vale of Glamorgan, which has a negative impact on existing sustainable transport options for everyday journeys.

It is important to consider sustainable transport options to improve connectivity along the Penarth to Cardiff Barrage Corridor to ensure the opportunities offered by Penarth's proximity to Cardiff are maximised. As stated in the Well-being Assessment 2017, 'Sustainable transport infrastructure and services can contribute to reducing negative impacts that cars have on the environment, reducing congestion, improving health and wellbeing, improving access to employment, health and education and other facilities and reducing the risk of road accidents.'

In May 2019, a WelTAG Stage One[3] assessment was agreed[4], which identified, developed and appraised a number of sustainable transport options along the corridor linking Cardiff and Penarth. This Report identified the following short-listed options for further investigation at WelTAG Stage Two:

- Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor;
- Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage;
- Option 3 – Cogan Multi-Modal Sustainable Transport Interchange.

The 'Do Minimum' option was also recommended to be taken forward for baseline assessment purposes.

A copy of the WelTAG Stage One report is included as Appendix 1 of the Impact Assessment Report (IAR) that accompanies this WelTAG Stage Two Report.

[1] Vale of Glamorgan Local Development Plan 2011-2026 – Local Development Plan Written Statement, June 2017 (pages 36, 46 and 48)
[2] https://www.valeofglamorgan.gov.uk/Documents/Our%20Council/Achieving%20our%20vision/Public-Services-Board/Well-being-Assessment/FINAL-ENGLISH-VERSIONS/Well-being-Assessment-English.pdf

[3] Penarth to Cardiff Barrage Sustainable Transport Corridor Study, WelTAG Stage 1 – Final Report, May 2019
[4] https://www.valeofglamorgan.gov.uk/en/our_council/Council-Structure/minutes,_agendas_and_reports/agendas/Scrutiny-ER/2019/19-07-23.aspx

1.2 Purpose of the Study

This WelTAG Stage Two study follows on from the WelTAG Stage One report into sustainable transport options for the Penarth to Cardiff Barrage Sustainable Transport Corridor. This Report presents the Stage Two: Outline Business Case of the WelTAG process. The Welsh Transport Appraisal Guidance (WelTAG 2017) details that, 'The purpose of Stage Two is to examine in greater detail the short list of options for tackling the problem under consideration', as agreed by the WelTAG Stage One report.

This WelTAG Stage Two appraisal of options has been undertaken in line with WelTAG 2017. The principles behind the Well-being of Future Generations (Wales) Act 2015 are embedded within the WelTAG process and have been an integral part of the development and appraisal of the options considered by this study.

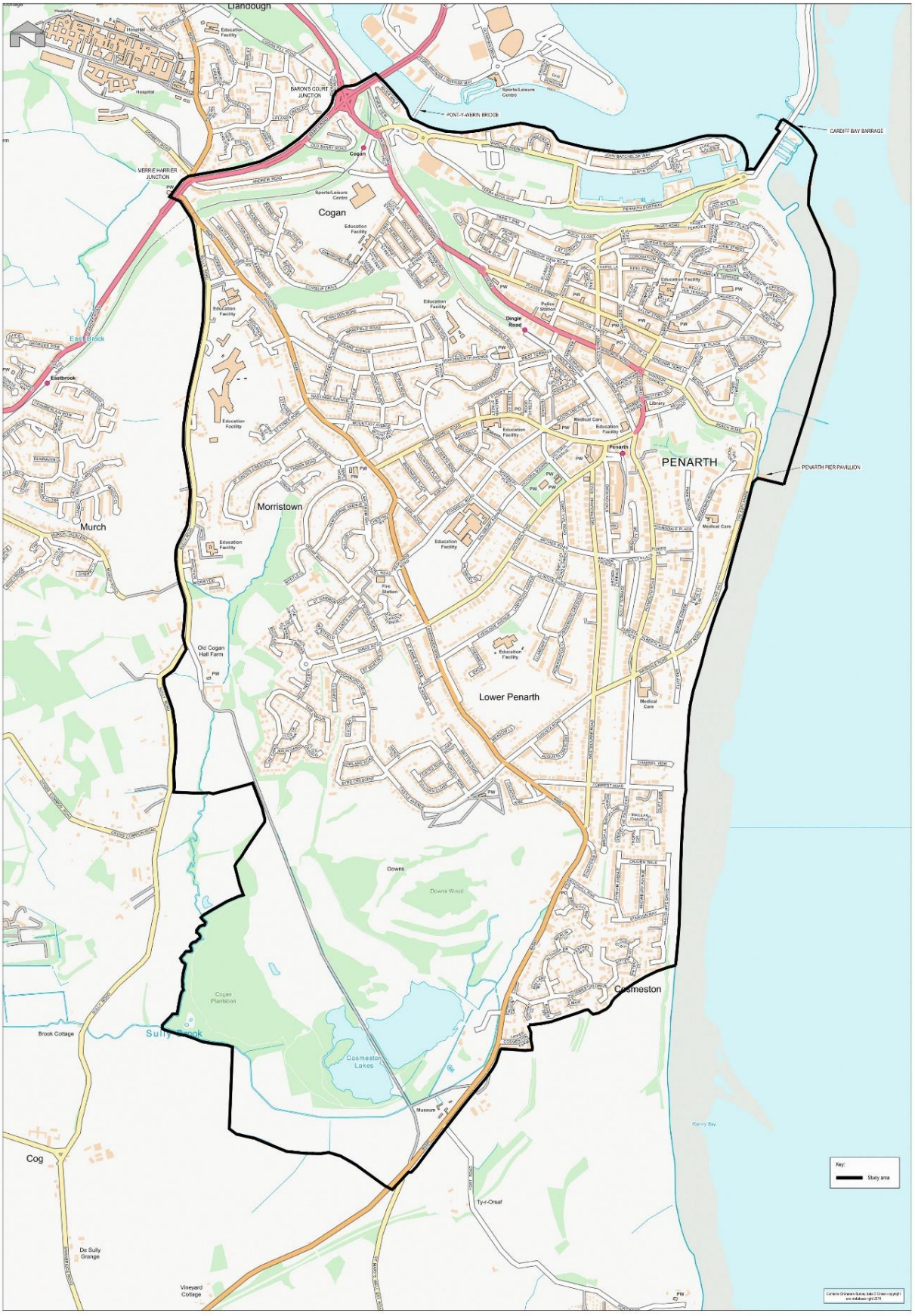
In addition to the detail provided in this Report, an accompanying Impact Assessment Report (IAR) provides a supporting record of detailed evidence and analysis.

The WelTAG Stage One and Two reports are supported by Consultation Reports, detailing the consultation activities that have been undertaken during the WelTAG process. The Consultation Reports are included within the IARs that accompany the WelTAG Stage One and Two reports.

1.3 The Study Area

A plan of the study area for WelTAG Stages One and Two is included as Figure 1.1. The study area encompasses the town of Penarth, including the residential areas of Penarth Marina to the north, Cogan and Morristown to the east and Cosmeston to the south. Two key junctions on the A4055 highway network (Merrie Harrier Junction and Baron's Court Junction) define the northern boundary of the study area. Three train stations are located within the study area, namely Penarth, Dingle Road and Cogan. Cardiff Barrage is included within the study area (despite being outside the Vale of Glamorgan local authority area) due to the importance of the link in considering sustainable transport options to and from Cardiff.

Figure 1.1 – Penarth to Cardiff Barrage Sustainable Transport Corridor Study Area



1.4 WelTAG 2017 (Stage Two: Outline Business Case)

In 2017, the Welsh Government issued updated Welsh Transport Appraisal Guidance[5], which is used to appraise all transport schemes in Wales. The original guidance was issued in 2008.

The Guidance has been used to appraise options developed as part of this Penarth to Cardiff Barrage Sustainable Transport Corridor Study to ensure that:

- As part of the Strategic Outline Case (WelTAG Stage One), the appraisal process used to produce a long list of options is compliant within current guidance; and
- An 'evidence' led approach has been adopted in selecting a short-list of options for consideration at the Outline Business Case (WelTAG Stage Two).

Throughout the WelTAG process, appraisal is based on the Five Case approach, which is used by the Welsh Government and HM Treasury in business cases for projects requiring public sector funding.

The Five Cases are as follows:

- The Strategic Case;
- The Transport/ Economic Case;
- The Financial Case;
- The Commercial Case; and
- The Management Case.

At Outline Business Case (WelTAG Stage Two), which is the subject of this Report, the purpose is to examine in greater detail the short list of options for tackling the problems under consideration.

The Stage Two report should set out how each of the proposed options will meet the stated objectives, the anticipated impacts of each option and the ways in which the context of the scheme will affect the achievement of the objectives. It should also consider the robustness of the proposed options to meet its objectives using sensitivity testing and scenario analysis including consideration of future scenarios. Key risks and dependencies should be presented.

Stage Two provides the evidence required for the WelTAG's Review Group to select a preferred option to take forward Stage Three (Full Business Case).

An appraisal methodology note is included in the IAR as Appendix 2, which details the approach taken to appraise the short list of options.

1.5 Well-being of Future Generations (Wales) Act 2015

The principles behind the Well-being of Future Generations (Wales) Act 2015 are embedded within the WelTAG process and have been an integral part of the development of the WelTAG Stage One and Stage Two reports.

[5] https://gov.wales/sites/default/files/publications/2017-12/welsh-transport-appraisal-guidance.pdf

The Act identifies seven well-being goals that public bodies must work to achieve and five ways of working that public bodies need to apply when making their decisions. A summary has been produced of how the five ways of working have been considered and applied throughout WelTAG Stages One and Two and is included within Appendix 3 of the IAR. This outlines the well-being considerations in undertaking the WelTAG process to date, but also recognises the ongoing importance of the five ways of working in the further development of options and the later WelTAG stages.

The well-being goals of the Well-being of Future Generations (Wales) Act 2015 have been central to the WelTAG process. For example, in WelTAG Stage One, the well-being goals and five ways of working were integral to the identification of problems, the development of study-specific objectives and the assessment of potential options. Each were assessed in terms of their potential to impact on or contribute to each of the national well-being goals. The WelTAG Stage Two option appraisal process has involved a more detailed assessment of the impacts of each option in relation to national well-being goals and the well-being objectives of relevant national and local public bodies, including the Welsh Government, the Vale of Glamorgan's Public Services Board and the Vale of Glamorgan Council.

1.6 Report Structure

This Report is structured as follows:

- Chapter 2 – This chapter provides the Strategic Case. It outlines any changes in the study area since the WelTAG Stage One report was undertaken, along with information on the development of the short list options and the stakeholder and public engagement activities. It provides a summary appraisal of the short list of options in terms of their ability to address problems and meet objectives, as well as outlining the potential adverse impacts and dependencies, constraints and risks of each option.
- Chapter 3 – This chapter provides the Transport Case. It outlines the results of the assessment undertaken into the economic, environmental, social and cultural impacts of the short list of options appraised. It also provides a value for money assessment.
- Chapter 4 – This chapter provides the Financial Case. This chapter discusses some of the capital and revenue costs that may be associated with the short list options, as well as highlighting the potential funding sources that may be available to undertake development work and implement a final preferred option.
- Chapter 5 – This chapter provides the Commercial Case. This provides a summary of the aspects that will need to be considered in procuring any future options for implementation. It considers potential private sector involvement and ongoing viability of each option.
- Chapter 6 – This chapter provides the Management Case. Details are provided of the development work required for each option, governance arrangements and potential statutory procedures that may be involved in scheme delivery. An assessment of the deliverability of each of the short list of options is provided.
- Chapter 7 – This chapter provides a summary and conclusion to the Report, recommending which options should be taken forward for further WelTAG assessment. It highlights the future work that may be required to undertake further assessment.

2. Strategic Case

2.1 Overview

As detailed in WelTAG 2017[6], the strategic case:

- Presents an evidence-based description of the current situation and the issue that needs addressing, describes the likely future situation if no action is taken and presents the reasons why an intervention is required;
- Involves an analysis of the factors that are contributing to the identified problem, as this will assist in the development of possible solutions;
- Establishes objectives against which the proposed solutions will be judged; and
- Sets out a narrative as to how each of the proposed solutions is intended to change the situation.

In line with WelTAG 2017, a detailed Strategic Case was presented within the WelTAG Stage One report (included as Appendix 1 in the IAR). This chapter provides an update to the information provided in the WelTAG Stage One Strategic Case, including details of option development work and additional consultation activities that have been undertaken as part of WelTAG Stage Two.

2.2 Policy Context

A policy review was undertaken to inform the development of the WelTAG Stage One report. This was included in the WelTAG Stage One IAR. The national, regional and local policy documents reviewed were as follows:

- National Policy
  - Prosperity for All: The National Strategy (2017);
  - Prosperity for All: Economic Action Plan (2018);
  - Emerging Wales Transport Strategy;
  - One Wales: Connecting the Nation (Wales Transport Strategy, 2008);
  - National Development Framework (anticipated publication – 2020);
  - Wales Spatial Plan (2008);
  - National Transport Plan (2010, updated 2011);
  - National Transport Finance Plan (updated 2017);
  - Planning Policy Wales (Edition 10, 2018);
  - Active Travel (Wales) Act 2013; and
  - Well-being of Future Generations (Wales) Act 2015.

- Regional Policy
  - Cardiff Capital Region Regeneration Plan 2018-2021.

- Local Policy
  - Vale of Glamorgan Public Services Board Well-being Plan 2018-2023: Our Vale – Our Future;
  - Vale of Glamorgan Council Well-being Objectives and Improvement Plan (2018/19);

[6] https://gov.wales/sites/default/files/publications/2017-12/welsh-transport-appraisal-guidance.pdf (page 19)

- Vale of Glamorgan Local Development Plan (2017);
- Vale of Glamorgan Local Transport Plan; and
- Penarth Town Place Plan.

The policy review that was undertaken at WelTAG Stage One remains current for this WelTAG Stage Two Report. The one document in the above list that has been updated since the WelTAG Stage One policy review is the Vale of Glamorgan Council Well-being Objectives and Improvement Plan. However following this update, no amendments have been made to the Council's Well-being Objectives for 2019/20, which are included in both the WelTAG Stage One and Two appraisal process.

2.3 The Case for Change

The case for change was set out in detail in the WelTAG Stage One report and remains current for this WelTAG Stage Two assessment. A summary is provided below of the key factors identified in the case for change.

Issues relating to levels of car use

- Evidence of high levels of car use along the Penarth to Cardiff Barrage corridor, which results in a range of negative impacts for local communities;
- High levels of car use results in problems of traffic congestion and delays. This affects key junctions (e.g. Baron's Court and Merrie Harrier) and routes linking Penarth and Cardiff, as well as more local roads within Penarth town centre, which has a negative impact on the town centre environment;
- The area has the highest rate of out-commuting in Wales, the majority of which is commuting into Cardiff;
- A previous study by Arup (2018)[7] has shown that 63% of Penarth residents travel to work by car or van which is by far the dominant mode of travel to work; and
- High traffic levels and congestion also impact upon emissions levels and air quality. A defined area on Windsor Road, Cogan was previously designated as an Air Quality Management Area (AQMA)[8].

Issues relating to public transport

- The Arup (2018) study found that 11.7% travel to work by train, which is significantly higher than the Wales average of 2.1% and reflects the good accessibility to the rail network for Penarth residents;
- Travel to work by bus is 3.1%, which is lower than the Wales average (4.9%);
- The unreliability and slow journey times of bus services reduces the attractiveness of travel by bus as an alternative to the car, particularly for commuting journeys;
- The current route for buses travelling from Penarth to Cardiff is via heavily trafficked roads with no bus priority measures in place; and
- Buses are subject to the same delays as private vehicles and journeys by bus take longer than the equivalent journey by car.

[7] Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup, October 2018
[8] https://uk-air.defra.gov.uk/aqma/details?aqma_ref=2003#1200

Issues relating to Active Travel

- The impact of traffic along with a lack of joined-up and good quality infrastructure for pedestrians and cyclists leads to safety concerns by more vulnerable users;
- Current levels of walking and cycling to work present a promising baseline on which to further increase levels of sustainable and active travel;
- The Arup (2018) study found that 3.7% travel to work by bike, which is more than double the Wales average of 1.5%, and 12.6% walk to work, which is higher than the Wales average of 11.2%;
- Factors such as the proximity of Penarth to Cardiff and the high levels of out-commuting to Cardiff, offer the potential to further increase the proportion of journeys by sustainable modes; and
- The provision of dedicated sustainable transport infrastructure along the Penarth to Cardiff Barrage Corridor would increase the attractiveness of travel by sustainable modes.

The need for change

- Measures to improve connectivity and accessibility to key services and facilities would have economic, social and environmental benefits for Penarth town centre and its surrounding communities;
- Improvements to sustainable transport linkages along the Penarth to Cardiff Barrage Corridor would enable Penarth to attract a greater number of leisure and tourism visitors from which the Cardiff Barrage and Cardiff Bay currently benefit;
- Measures to reduce levels of car use and increase levels of sustainable and active travel will have a positive impact on emissions and air quality;
- If no action is taken, levels of car use are likely to increase, and the associated negative economic, social and environmental impacts of traffic delays and congestion are likely to worsen;
- The negative impacts of traffic volumes on the attractiveness of existing sustainable travel options are likely to increase;
- Journey time delays for buses are likely to worsen and traffic volumes are likely to have an increasing negative impact on Penarth town centre and reduce its attractiveness as a destination for journeys by Active Travel modes; and
- Should no action be taken, private vehicle usage would be expected to increase in line with the projected increase in population levels of both Cardiff and the Vale of Glamorgan[9]. Appendix 4 of the IAR includes details of local authority population projections. As a result, it is likely the associated negative impacts (e.g. air quality and congestion) will become worse.

2.4 Identification of Problems

The WelTAG Stage One study identified existing problems affecting the Penarth to Cardiff Barrage Corridor. The problems were identified through the WelTAG Stage One stakeholder and public consultation events, which required those attending to consider and identify problems affecting the study area. The results of the consultation events, along with information gathered from previous studies and existing policy documents, such as the Local Development Plan, enabled a list of the key problems to be developed. The identification of problems was also informed by the seven goals of the Well-being of Future Generations (Wales) Act 2015, as detailed in Section 1.5.

[9] https://statswales.gov.wales/Catalogue/Population-and-Migration/Population/Projections/Local-Authority/2014-based/populationprojections-by-localauthority-year

The problems identified are associated with high levels of car use and relatively low levels of travel by more sustainable modes, which are having a negative impact on journey times, accessibility and connectivity, air quality and the safety of more vulnerable road users. A summary of the problems identified is as follows:

- Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution;
- Volume of traffic is a barrier to walking and cycling;
- High levels of car use and low levels of public transport use;
- Sustainable transport options not an attractive alternative to car travel;
- Unreliable and slow journey times of bus services;
- Lack of park and ride facilities limits opportunities for public transport interchange;
- Low levels of Active Travel;
- Safety issues act as a barrier to walking and cycling;
- Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes;
- Lack of facilities for cyclists at trip origin and destination;
- Environmental factors reduce the attractiveness of walking and cycling;
- Topography of the area acts as a barrier to walking and cycling;
- Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and
- Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.

2.5 Objectives for the Study Area

The WelTAG Stage One process involved the identification of five study objectives, which were developed through the WelTAG consultation events, a review of previous studies and consideration of the identified problems. As part of the WelTAG Stage One process, the five objectives were assessed in terms of their potential to have a positive impact on each of the identified problems and their potential to work towards each of the national well-being goals.

The five agreed objectives, which remain current for this WelTAG Stage Two assessment, are as follows:

1. Enhance sustainable connectivity throughout the Penarth to Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel;
2. Reduce barriers that constrain opportunities to increase travel by sustainable transport modes;
3. Increase sustainable transport options that improve accessibility along the Penarth to Cardiff Barrage transport corridor and support social inclusion, health and well-being;
4. Deliver sustainable transport improvements that encourage increased economic activity and support long term investment and
5. Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.

2.6 Option Development

The three shortlisted options being considered by this WelTAG Stage Two Report are:

- Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor;
- Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage; and
- Option 3 – Cogan Multi-Modal Sustainable Transport Interchange.

The WelTAG Stage Two process has involved the 3 shortlisted options being developed further and explored in greater detail to inform the Stage Two appraisal. The following section examines each option in turn and provides background to the additional work that has been undertaken as part of the WelTAG Stage Two process. This section also highlights areas where additional feasibility work has not been undertaken and where the Stage Two assessment has relied on available information from previous studies. This is particularly the case in relation to the Penarth Headland Link (PHL) proposal within Option 1 and the proposal to introduce buses onto Cardiff Barrage within Option 2, both of which benefit from having previous feasibility work undertaken.

The WelTAG Stage Two option development work included consultation with stakeholders on specific issues e.g. representatives from Vale of Glamorgan Council, Cardiff Council, Transport for Wales (TfW), Sustrans and Cardiff Bus. The option development work has enabled high-level, preliminary cost estimates to be developed and an economic assessment to be undertaken for each option, which are detailed within the Transport Case section of this Report.

Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor

WelTAG Stage Two Option 1 Description

Option 1 comprises a network of Active Travel links within the study area. The links included within the option are those routes within the Vale of Glamorgan Council's Active Travel Integrated Network Map (INM) that are considered to have most benefit to the Penarth to Cardiff Barrage Corridor. A plan of the routes included within Option 1 is included as Figure 2.1. The network of Active Travel routes within Option 1 includes the Penarth Headland Link (PHL) proposal, which is a proposed 1km rock-fill causeway between Penarth Esplanade and Cardiff Barrage to provide a shared-use pedestrian and cycle route. The option also includes complementary, area-wide active travel measures i.e. introduction of a 20mph zone/ limit and a bike hire scheme.

Figure 2.1 – Plan of Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor

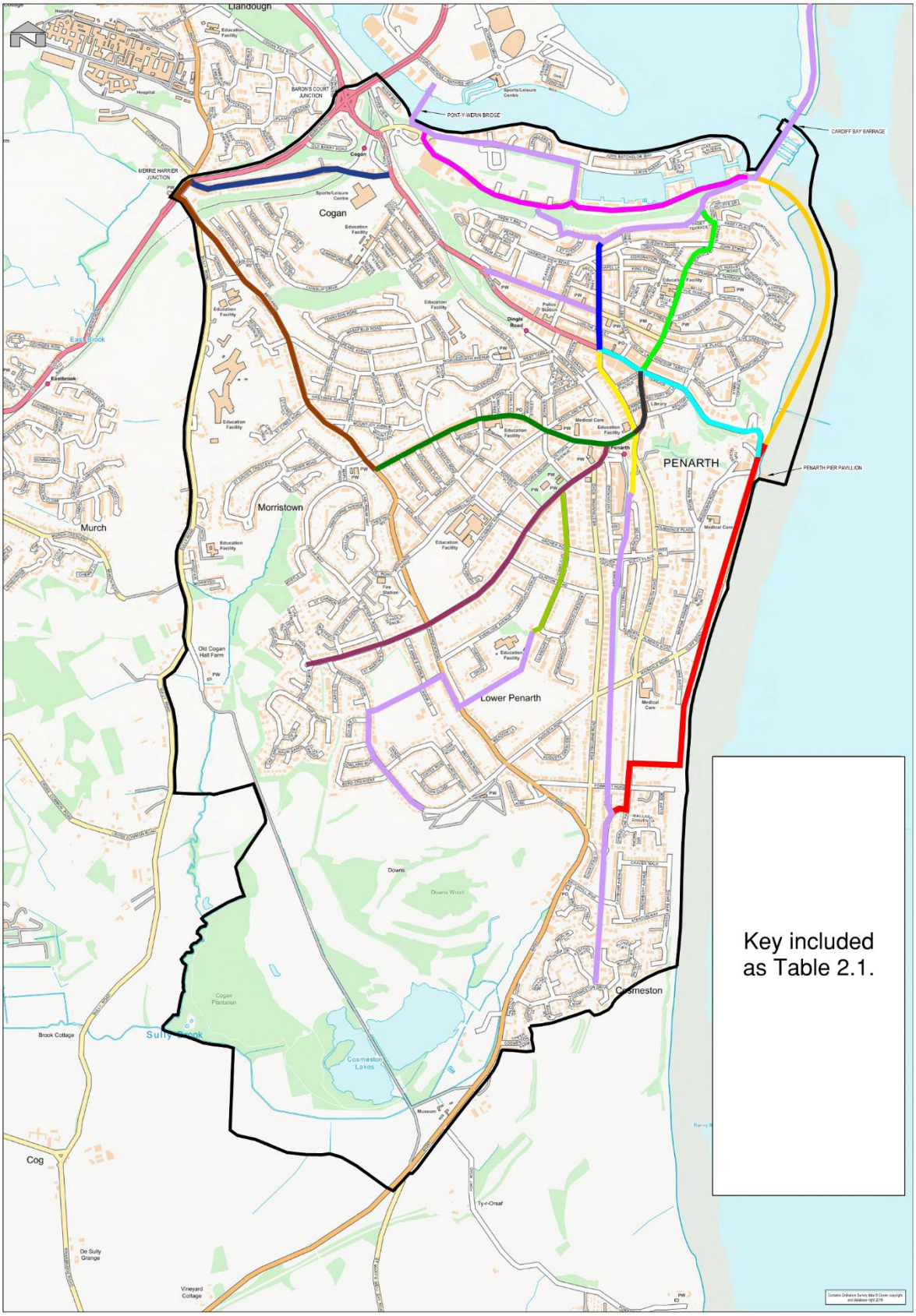


Table 2.1 – Key for Figure 2.1

Link Reference	Description of Link	Colour of Link
Link A	Zig-zag path to Penarth Town Centre via Royal Close and Arcot Street	
Link B	Cardiff Barrage to Penarth Town Centre via Paget Road, Stanwell Crescent and Albert Road	
Link C	Penarth Town Centre to Penarth Esplanade via Windsor Road, Windsor Terrace and Beach Road	
Link D	Stanwell Road Link (from Windsor Road junction to Plymouth Road junction)	
Link E	Penarth Marina Link via Penarth Portway and Terra Nova Way	
Link F	Cornerswell Road and Stanwell Road Link	
Link G	Dinas Road and Victoria Road Link	
Link H	Penarth Town Centre to Railway Walk via Hickman Road and Plymouth Road	
Link I	Penarth Esplanade to Railway Walk via The Esplanade, Cliff Hill, Channel View and the Paddocks	
Link J	Cwrt-y-Vil Road and Robinswood Crescent Link	
Link K	Penarth Headland Link	
Link L	Andrew Road Link to Cogan Station	
Link M	Redlands Road Link	
Existing Active Travel Connections		
Study Area		

Development of Option 1

This section details the work that has been undertaken to develop Option 1 as described above.

The development of Option 1 was based upon the Vale of Glamorgan's Active Travel Integrated Network Map (INM), which sets out the aspirations for Active Travel improvements across the whole of the Vale of Glamorgan local authority area. All Active Travel schemes within the INM have previously been consulted upon and approved by the Welsh Government. The INM contains a number of proposed improvements within the WelTAG Stage Two study area. A map of all INM proposals in the Penarth area are included in Appendix 5 of the IAR.

The focus of this WelTAG study is on the Penarth to Cardiff Barrage Corridor. It was identified that the proposed improvements in the INM across the Penarth area will have varying levels of benefit to the corridor and in improving connections to the existing Active Travel routes into Cardiff via Cardiff Barrage and Pont-y-Werin. A review was undertaken of all the INM proposals and key trip attractors within the study area, e.g. existing Active Travel routes, residential areas, Penarth Town Centre, Penarth Rail Station, retail areas and schools, to identify those proposals that were considered to have most benefit to the Penarth to Cardiff Barrage Corridor. A plan showing the location of key trip attractors is included within Appendix 6 of the IAR. This resulted in a network of routes being identified for Option 1 that focus upon connecting origins and destinations along the Penarth to Cardiff Barrage Corridor and provide links to and from Cardiff Barrage to services and facilities in the town centre and to residential areas.

The development of the proposed network of routes within Option 1 was informed by WelTAG Stage Two consultation activities that were undertaken. As a result of comments received through the stakeholder workshop and the public consultation, additional routes from the INM were included within Option 1 to ensure the network provided links to Cogan Station. Further details of the consultation activities are included in Section 2.7. More general feedback from the public consultation will also be used to inform the future development of the network should Option 1 be recommended to progress to WelTAG Stage Three.

The map of proposed Active Travel links included within Option 1 are shown as Figure 2.1.

The INM proposals shown in Figure 2.1 are at an early stage of development and the improvements proposed along these links yet to be defined. The exception to this is the PHL proposal that has benefited from a number of technical studies and development work already having been completed. A list of the PHL studies that have been completed to date are included in the IAR (Appendix 7).

The construction of the PHL proposal was included in the Cardiff Bay Barrage Act 1993[10], which includes the following description of the PHL within 'Schedule 1: Descriptions of Main Works':

'Work No. 2 – Construction of a promenade, comprising a pedestrian and cycle route along the foreshore beneath Penarth Head, commencing with the concrete sea defence works to the promenade at Penarth at grid reference ST 18964 71389 and terminating with the existing cliff beach and foreshore beneath Penarth Head at grid reference ST 19067 72328.'

[10] https://www.legislation.gov.uk/ukpga/1993/42/contents

Legal Counsel Opinion provided to Vale of Glamorgan Council[11] is that the planning permission deemed to be granted under section 24 of the Cardiff Bay Barrage Act 1993 would still apply to the PHL and states that:

'Planning permission shall be deemed to have been granted under Part III of the Town and Country Planning Act 1990 for any development of land consisting in the carrying out of any works or other operations authorised by this Act or the making of any change in the use of land by the carrying out of any such operations.'

It is understood that should the Cardiff Bay Barrage Act 1993 be used to take forward the implementation of the PHL, then this would require the design to be a barrage structure in line with the description in the Act. Therefore, the basis of the design assumption used in this WelTAG Stage Two Report is due to the requirements and restrictions of the Act. Legal Counsel opinion provided to the Vale of Glamorgan Council[11] is that the proposal for a PHL on a rockfill base at a height of 8m would 'fall within the relevant limits of deviation and other descriptions for the Link in the 1993 Act.'

The requirements of the Act, existing technical studies and available preliminary cost estimates for the PHL formed the basis of the WelTAG Stage Two assessment on issues relating to the PHL. It should be noted that no detailed review has been undertaken as part of the WelTAG Stage Two process of the proposed design of the PHL or the preliminary cost estimates that have been developed by previous reports.

The PHL was the only route within Option 1 that has been the subject of previous studies. All other INM routes within Option 1 have not been developed in any detail and therefore a desktop exercise was undertaken to review the proposed routes and identify potential Active Travel improvements along each of the links. The desktop exercise considered the following aspects:

- Any existing information available about each route e.g. whether the route had been considered by Sustrans during the development of the INM[12], comments about each link received from stakeholders;
- Existing route characteristics, observations and constraints, e.g. issues that may impact on the Active Travel improvements proposed such as gradient, highway/footway width, levels of car parking, visibility issues, quality of crossing points etc.;
- Length of each route;
- Origins and destinations connected by each route;
- Potential Active Travel improvements that could be delivered along each route;
- Known interdependencies e.g. wider considerations that may impact on the deliverability of a proposed route; and
- Risks and deliverability considerations e.g. land, environmental etc.

The information compiled about each link within Option 1 is included in the IAR (Appendix 8) and was used as the basis for proposing Active Travel improvements along each link. Appendix 9 within the IAR is a summary of the resulting Active Travel measures proposed along each route and was used to develop preliminary cost estimates for this WelTAG Stage Two Report. The Welsh Government's Active Travel Design Guidance has been used to inform the development of the proposals[13]. Further detail about the cost estimates that have been developed are provided in

[11] Opinion provided to Council by Legal Counsel Robin Purchas QC, 28th March 2018
[12] Vale of Glamorgan Integrated Network Map (INM) Cycling and Walking Audits – Penarth, Sustrans, August 2017
[13] https://gov.wales/sites/default/files/publications/2017-09/active-travel-design-guidance.pdf

Chapter 3: Transport Case. It should be noted that the proposed improvements and associated cost estimates are at a very early stage of development and will need to be further refined as the Active Travel proposals are further developed.

The majority of INM routes included in Option 1 follow the alignment of the highway network. The extent of improvements proposed have been limited by the constrained nature of the road network within Penarth and the limited space available to implement segregated, off-road Active Travel improvements. As a result, the majority of measures proposed are on-road improvements, with some larger-scale improvements proposed at key junctions.

Due to the limited scope to provide off-road improvements along the routes being considered, a complementary proposal that forms part of Option 1 is the implementation of an area-wide 20mph limit across a large proportion of the study area. It is considered that the reduction of traffic speed along the proposed Active Travel routes would have benefits to the perception of safety for those walking and cycling. The cost of a proposed 20mph limit is not included within the cost estimate for Option 1 at this stage, as an area for the 20mph limit has yet to be defined. This element of the proposal would need to be further developed should Option 1 progress to WelTAG Stage Three.

It was recognised at WelTAG Stage One that complementary measures to the provision of Active Travel route improvements should form part of Option 1. These include the provision of facilities at employment sites and other destinations, e.g. secure cycle storage, pool bikes and changing facilities, and softer measures such as school travel plans and walking buses. Many of these complementary measures are reliant on third parties to implement and have not been included within the option development work or cost estimates for Option 1.

One such complementary measure that could have a significant impact on increasing levels of cycling in the study area is the introduction of a bike hire scheme. This would build upon the success of the bike hire scheme that is in place across Cardiff and would increase opportunities for cycling journeys between Cardiff and Penarth. Vale of Glamorgan Council has recently tendered for a bike hire scheme to be implemented in Penarth, which would be funded through S106 developer contributions. Potential bike hire locations have been identified at:

- Llandough Hospital,
- Cogan Leisure Centre/ Cogan Train Station,
- Pont-y-Werin,
- Dingle Road Train Station,
- Penarth Train Station,
- Windsor Road (Town Centre),
- Penarth Esplanade/ Pier,
- Cosmeston Lakes Country Park,
- Penarth cliff tops,
- Stanwell Comprehensive School; and
- St. Cyres Comprehensive School.

Appendix 10 of the IAR includes a plan showing these potential bike hire locations. There are clearly beneficial linkages between the proposed Active Travel route improvements and the bike hire locations that would have a positive impact on increasing levels of cycling. This initiative has been included within the economic assessment for Option 1 due to a greater degree of certainty around the proposal than other complementary measures.

Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage

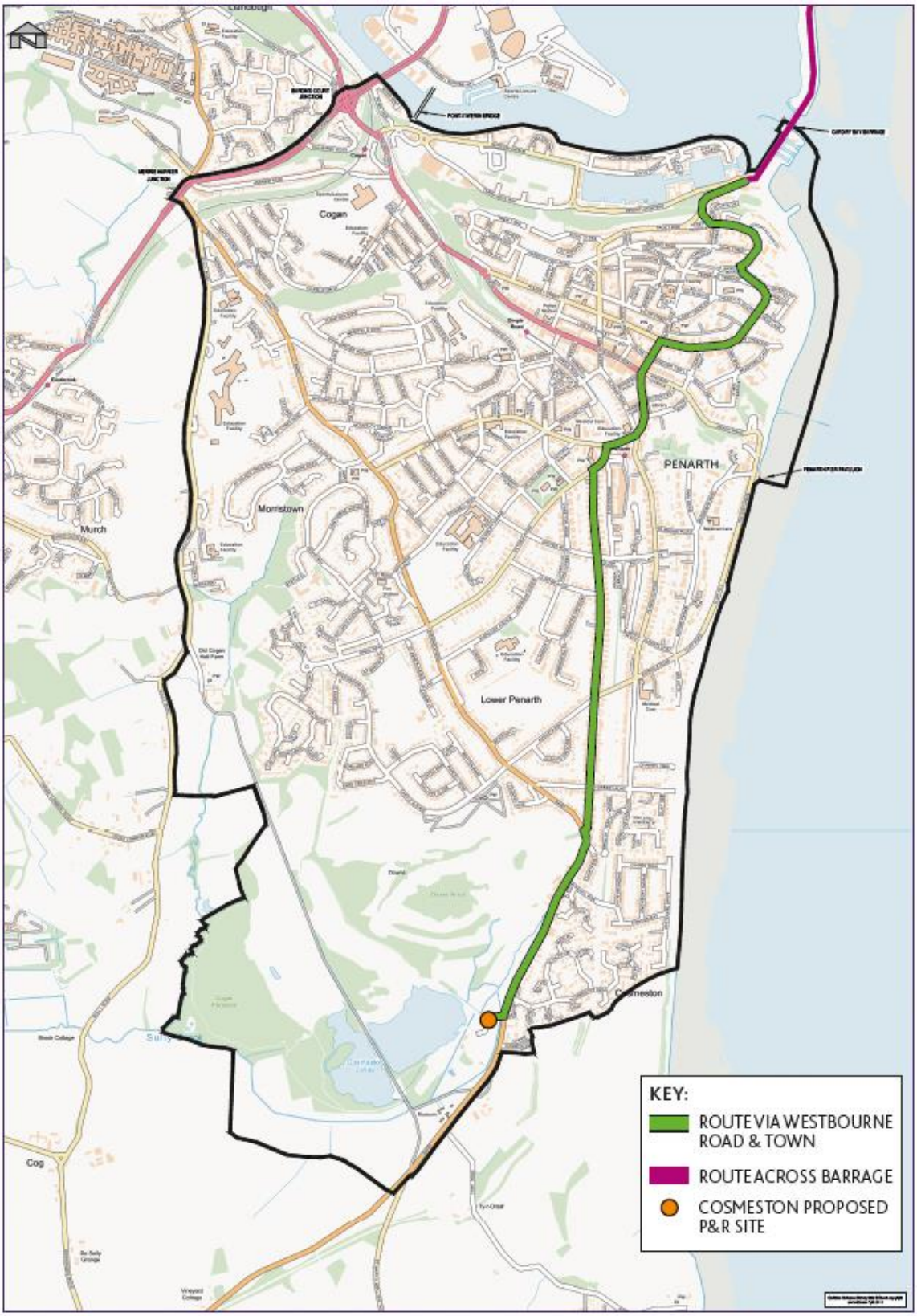
WelTAG Stage Two Option 2 Description

This option consists of a bus park and ride and bus priority scheme providing a link along the Penarth to Cardiff Barrage Corridor. The option includes the following elements:

- A bus park and ride facility at Cosmeston Lakes Country Park. The park and ride facility would provide approximately 150 park and ride spaces and include a covered waiting area, lighting, CCTV, secure cycle storage and electric vehicle charging infrastructure;
- The bus route from the park and ride facility to Cardiff Barrage would travel along the B4267, Westbourne Road, Stanwell Road, Albert Road, Clive Place, St Augustine's Crescent, Paget Place and Paget Road to provide access to Cardiff Barrage; and
- Continuation of the bus route across Cardiff Barrage to provide direct access to Cardiff Bay and onto Cardiff city centre.

A plan of the proposal is included as Figure 2.2.

Figure 2.2 – Plan of Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage



Development of Option 2

This section details the work that has been undertaken to develop Option 2 as described above. Each of the elements will be described in turn.

Element A – Bus Park and Ride facility at Cosmeston Lakes Country Park

The proposal for a bus park and ride facility at Cosmeston is included within the Vale of Glamorgan's LDP as Policy SP7(8) 'Bus park and ride at Cosmeston, Penarth'. This is shown on the LDP proposals map as an indicative location for the facility rather than specifying the exact land allocation. The bus park and ride proposal was also considered by the Arup (2018) report[14] but again the exact area of land to be developed was not specified.

In order to develop a better understanding of the bus park and ride facility for the WelTAG Stage Two appraisal, a review has been undertaken of three potential sites for the facility, all of which are currently used as overflow parking areas by Cosmeston Lakes Country Park. The review involved consideration of the advantages and disadvantages of each potential site and is included in Appendix 11 of the IAR. Following this review, the preferred location for the park and ride site was determined to be a greenfield location to the north of the access into Cosmeston Lakes Country Park, which is currently used as overflow car park during peak periods. This was considered the preferred location as it limits the extent of tree removal required to develop the site, it has sufficient space to accommodate the 150 parking spaces required and the associated park and ride infrastructure e.g. bus turning area, passenger waiting facilities. A preliminary cost estimate has been developed for this WelTAG Stage Two study, based on the provision of a park and ride facility at this preferred location.

The review also considered access onto and within the site for the buses and additional car traffic that would use the park and ride facility. Following this high-level review, no improvements to the highway access onto the site have been included within the scheme description or within the cost estimate for Option 2. The cost estimate does include internal site improvements to accommodate bus access and circulation within the park and ride facility.

Element B – Bus route from the park and ride facility to Cardiff Barrage

A policy to provide bus priority measures on the corridor between Cosmeston and Cardiff Bay is included as a policy within the Vale of Glamorgan's LDP (Policy SP7(9)), which refers to the route along 'Lavernock Road to Cardiff via the Barrage.' The bus priority route to the barrage was also considered by the Arup (2018) report. The Arup report considered four potential routes linking the bus park and ride and the barrage, including the route proposed in the LDP, and recommended a preferred route based on a qualitative assessment of the routes. The three highest scoring route options assessed by the Arup (2018) report were further considered as part of the WelTAG Stage Two development work. A desktop review was undertaken to highlight advantages and disadvantages of each of the routes and the potential for bus priority measures to be implemented. This review, including a plan of the three routes considered, is included in Appendix 12 of the IAR. The resulting preferred route was the same as that recommended by the Arup (2018) report and links the park and ride facility with Cardiff Barrage via the B4267, Westbourne Road, Stanwell Road, Albert Road, Clive Place, St Augustine's Crescent, Paget Place and Paget Road. This is considered

[14] Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup, October 2018

to be the most direct route and benefits from providing additional connections to Penarth rail station and Penarth Town Centre.

The review highlighted that all the route options would require the bus service to travel through areas of congestion on the local highway network. It also highlighted the constraints of the existing highway network, such as the dense nature of the built environment and high levels of on-street parking, particularly at key congestion points such as junctions within Penarth Town Centre. Feedback from stakeholders on the preferred bus route also highlighted issues of parked vehicles and space constraints, particularly around the Victoria Road/ Stanwell Road area. The junction of Paget Terrace and Paget Road was also highlighted as creating a difficult turning movement for buses. Positive feedback was received from stakeholders in relation to much of the proposed route already being served by buses and therefore associated infrastructure is already in place along much of the route.

The constraints of the highway network along the route greatly limit the bus priority measures that can be provided, particularly at those areas of congestion that are most likely to cause delays for bus services. Due to these constraints, the cost estimate developed for Option 2 does not include provision for any bus priority measures along the route between the park and ride facility and Cardiff Barrage. The cost estimate does include a cost for carriageway realignment at the Paget Road/ Paget Terrace junction in Penarth to enable larger buses to more easily negotiate the junction.

Element C – Bus route across Cardiff Barrage

The element of the option to provide a bus route across Cardiff Barrage has benefited from development work already having been undertaken. Cardiff Council have previously commissioned studies to assess the technical and operational feasibility of introducing buses onto Cardiff Barrage. The list of the studies completed to date are included in the IAR (Appendix 13). The main study that has informed the WelTAG Stage Two was undertaken by Arup (2015)[15] and is a feasibility study of the technical and operational issues associated with a bus route over Cardiff Barrage. The details within the 2015 report have formed the basis of the WelTAG Stage Two assessment on issues relating to the bus route across Cardiff Barrage. It should be noted that no detailed review has been undertaken at this stage of the existing work or the preliminary cost estimate that has been previously developed.

The infrastructure works required to implement this section of the route and associated preliminary cost estimates are based on those identified in a 2015 Arup report. They include measures to segregate vehicles and pedestrians/ cyclists on the barrage, upgraded barrier controls and new automated bollard systems on the bascule bridge section of the barrage and the construction of a new section of 'busway' at the northern end of the barrage to link into the existing highway network in Cardiff Bay. Two route options are included in the 2015 report for the provision of the new section of bus route required along the barrage. The options are either via a new busway adjacent to the existing shared-use path along the barrage (owned by Welsh Government) or via Cargo Road (owned by Association of British Ports). For the purposes of this WelTAG Stage Two study, the highest cost route option has been included within the cost estimate for Option 2.

In terms of the bus park and ride route as a whole, the WelTAG Stage Two assessment is based on the park and ride service terminating in Cardiff City Centre, rather than Cardiff Bay, in order to maximise usage of the service. This is in line with the Arup (2015) report that did not consider the

[15] Cardiff Bay Barrage Transport Link Feasibility Report, Arup, October 2015

wider bus route in any detail but does state that 'maximising its usage and commercial viability would require the service to connect Penarth town centre and Cardiff City Centre.' The WelTAG Stage Two cost estimate does not include an allowance for bus priority measures elsewhere on the route e.g. on the route into Cardiff city centre.

A key constraint identified by the Arup (2015) report is that due to the operational nature of the barrage and the need to allow the passage of water vessels through the barrage, there is a limit to the frequency that a bus service across the barrage could operate. The report states that 'a bus service operating twice every hour is considered to be the maximum feasible service' and that 'based on current lock operations, it is considered unlikely that a reliable 15-minute service would be feasible.' This would be a major constraint to the operation of a bus park and ride service over Cardiff Barrage, as a half hourly frequency would not be considered by users to be a 'turn up and go' service. This is not considered a sufficient frequency to service a park and ride facility and would impact on the success and attractiveness of the bus park and ride. At a WelTAG Stage Two stakeholder meeting with Cardiff Bus representatives,[16] comments were received that a service frequency of no less than every 20 minutes throughout the day is required for a park and ride. As such, the development of the economic assessment of Option 2 has been based on a 20-minute service, however the proposed frequency would need greater investigation to identify whether it would be operationally feasible.

The development of the economic assessment has assumed that the existing Baycar 6 bus service, which currently runs from Cardiff City Centre to Cardiff Bay would be extended over the barrage, through Penarth and onto the park and ride facility. The extension of the Baycar service is considered the most cost-effective way of servicing the park and ride facility and this was reiterated at the WelTAG Stage Two stakeholder meeting with Cardiff Bus representatives. It should be noted that the Baycar service currently uses articulated 'bendy' buses that are unlikely to be able to negotiate the Paget Road/ Paget Terrace junction in Penarth and this will need further consideration in the future development of the scheme. Further details about the economic assessment that has been undertaken and assumptions made about the park and ride bus service, e.g. hours of operation, is included in Chapter 3: Transport Case.

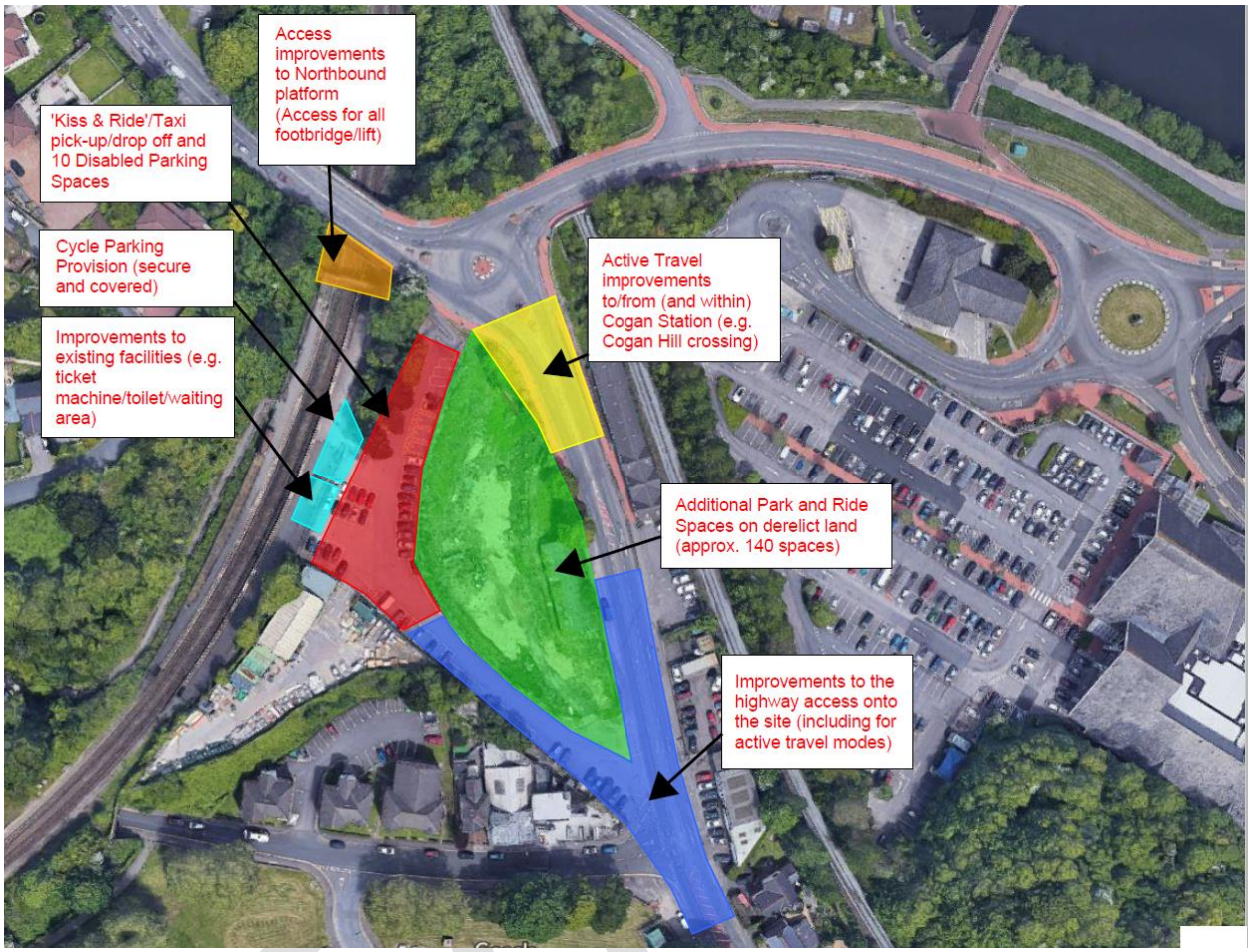
Option 3 – Cogan Multi-Modal Sustainable Transport Interchange

WelTAG Stage Two Option 3 Description

Option 3 comprises a range of improvements to Cogan Station to create a multi-modal interchange facility and improve integration between rail and other transport modes. This includes the development of vacant land to provide an expanded park and ride facility with approximately 150 spaces, on-station improvements including an Access for All bridge over the rail line and improvements to Active Travel links and facilities. A plan of the proposal is included in Figure 2.3.

[16] WelTAG Stage Two stakeholder meeting with Cardiff Bus, 26th April 2019

Figure 2.3 – Plan of Option 3 – Cogan Multi-Modal Sustainable Transport Interchange



Development of Option 3

This section details the work that has been undertaken to develop Option 3 as described above.

A previous masterplan study for Cogan Station has been completed on behalf of Transport for Wales (WSP 2016)[17]. This study proposed a number of potential development options for the Cogan Station site but did not recommend a preferred option or include cost estimates. For the purposes of the WelTAG Stage Two study, a review was undertaken of all elements in the 2016 masterplan study and a judgement made on which elements should be included within the scheme description at this stage. Following this review process, the following elements have been included within Option 3:

- Provision of approximately 140 Park and Ride car parking spaces through development of vacant land at the eastern end of the site, along with the provision of 10 disabled parking spaces and a drop-off area/ taxi interchange on the current park and ride parking area. This would provide approximately 95 additional spaces to the 55 spaces currently available (as detailed in the 2016 report). This vacant area of land has been purchased by the Welsh Government and it is believed that the Welsh Government has aspirations for a transport hub at Cogan Station. The cost estimate developed for the WelTAG Stage Two study includes lighting and CCTV and has assumed that 10% of the total will be EV charging spaces;

[17] Cogan Railway Station – Master Plan for Development and Regeneration Opportunities, WSP, May 2016

- Provision of an 'Access for All' bridge over the railway line. The 2016 study also identifies the need to relocate an existing Grade II Listed bridge over the railway line, although this element has not been included within the cost estimate developed for this WelTAG Stage Two Report;
- Improvements to the highway access onto the site (i.e. from A4160 Windsor Road);
- Improvements to existing station facilities e.g. provision of a new ticket machine, customer toilets, secure and covered cycle parking and new shelters for passengers. Some of these elements were proposed by the 2016 study although improvements to the existing platforms (e.g. shelters) were not considered by the study. It should also be noted that some improvements to Cogan Station are planned by TfW and due for completion by June 2022. Details of these planned improvement works are included in Appendix 14 of the IAR; and
- Active Travel improvements within and to the interchange facility. Specific improvements that have been included within the cost estimate for the WelTAG Stage Two study are a segregated pedestrian footway into the site from the main Windsor Road access, improvements to pedestrian routes to nearby bus stops to south of the site and improvements to the existing Cogan Hill roundabout crossing point.

It should be noted that Option 3 does not include all the proposals that were included within the 2016 masterplan study. In general, it is considered that the constraints of the Cogan Station site and the space available for new infrastructure may limit the combination of measures that are progressed. Specific proposals from the 2016 study that are not included within Option 3, and the reasons for their non-inclusion, are as follows:

- Potential development of the existing Travis Perkins site to provide additional park and ride spaces – The WelTAG Stage Two proposal for Option 3 has not included the development of the Travis Perkins site. Option 3 has assumed that only land currently available is developed for the expanded park and ride facility. This is due to the uncertainties surrounding the Travis Perkins site, which is currently operational and in Third Party ownership;
- Potential provision of a fourth arm and/ or capacity improvements on Cogan Hill roundabout – This element is not included within Option 3 as it considered to be a high cost proposal that requires greater feasibility work to determine whether it is deliverable in view of the site constraints e.g. the constraints of existing highway network, the impact of nearby structures and level differences between the existing roundabout and the Cogan Station site. It would also impact upon the existing pedestrian access ramp to the station from Cogan Hill roundabout. It is not considered appropriate to include within Option 3 at this stage due to the uncertainties surrounding this proposal;
- Provision of a new bus interchange facility – At the current stage of development, it is unclear whether the site would have sufficient space to accommodate bus movements along with an expanded park and ride facility and improvements to the Active Travel infrastructure within the site. The 2016 report makes reference to the current access road into Cogan Station being more suited to a one-way arrangement for buses, which would not be feasible without the inclusion of the fourth arm on Cogan Hill roundabout. Widening of the access road into the site to accommodate bus movements would also impact upon the space available to provide attractive Active Travel links into the site. It should be noted that there are bus stops in relatively close proximity to the site (50m) that are serviced by frequent bus services (10-minute frequency) and offer opportunities for interchange with the rail services at Cogan Station. During the WelTAG Stage Two consultation activities, bus operator representatives expressed doubts about the benefits of diverting bus services into Cogan Station and raised concerns about the potential delay this diversion could cause to existing services. As such, Option 3 does not include provision of a bus interchange facility within the site at this stage, but the

preliminary cost estimate does include minor improvements to pedestrian routes from the site to existing bus stops in the vicinity of Cogan Station;

- New platform on the existing Penarth to Cardiff line (linked to a potential future light rail branch line) with access to and from the existing station infrastructure – This is considered a long-term rail proposal that is outside the scope of this WelTAG Stage Two study. Consultation with TfW has confirmed that no work to progress this proposal is being undertaken at the current time; and
- Wider and longer-term development opportunities linked to the development of the station e.g. the 2016 report makes reference to the potential for a social housing development to be constructed above the proposed park and ride car park and the potential redevelopment of land adjacent to Andrew Road that is currently operating as a taxi business. These are considered longer-term proposals that are outside the scope of this WelTAG Stage Two study.

In terms of the development of a cost estimate for Option 3, the 2016 masterplan study did not include any cost estimates for the Cogan Station proposals. As such, a preliminary cost estimate for Option 3 has been developed for this WelTAG Stage Two study based on the proposed scheme elements described above. Further detail of the cost estimate is provided within Chapter 3: Transport Case.

Environmental and ecology impacts

In addition to the option development work, an overview has been compiled on environmental and ecology issues affecting the study area as a whole.

An ecological overview has been undertaken to identify statutory and non-statutory sites across the study area. This has identified there are two Nationally or Internationally important sites, e.g. Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), lying within the 2 km search area. These are the Severn Estuary (RAMSAR, SSSI, SAC, SPA) and Cosmeston Lakes (SSSI). There are also several non-statutory sites within the study area, for example Cosmeston Lakes and Country Park, which holds a Local Nature Reserve status as well as being a SSSI. The detail of the ecological overview is included in the IAR (Appendix 15).

A desktop review of environmental constraints has also been undertaken for each option. The detail of the environmental appraisal is included in the IAR (Appendix 16). The review has used available information to assess the impacts of each option in relation to the following:

- Air quality;
- Cultural heritage;
- Landscape;
- Nature conservation;
- Geology and soils;
- Noise and vibration;
- Road drainage and the environment; and
- Other considerations.

The results of the ecological overview and review of environmental constraints have been used in the Transport Case appraisal of each of the options and in the development of the Management Case, e.g. when assessing risks, constraints and deliverability considerations.

2.7 Consultation

Consultation with stakeholders and the public has played a key part in the WelTAG process. This links closely to the importance of collaboration and involvement, which feature within the five ways of working of the Well-being of Future Generations (Wales) Act 2015.

At WelTAG Stage One, the development of the Strategic Case was informed by a stakeholder workshop and public consultation event that took place in Penarth on 17th and 24th January 2019 respectively. These consultation activities helped to inform the WelTAG Stage One Strategic Case, including the identification of problems, the development of study objectives and a long-list of potential options to address the problems identified.

The WelTAG Stage Two process has involved additional consultation activities to inform the development and appraisal of the shortlisted options. The WelTAG Stage Two Consultation Report (Appendix 17) provides a detailed account of the consultation activities that have been undertaken at WelTAG Stage Two and the results of the consultation.

A summary of the WelTAG Stage Two consultation activities is as follows:

- A WelTAG Stage Two stakeholder meeting was held with Cardiff Bus on 14th April 2019;
- A stakeholder workshop was held on 22nd May 2019 and was attended by 19 stakeholders. Attendees included representatives from local government, public service bodies and transport operators. The workshop gathered views from stakeholders on the advantages and disadvantages of each option, along with opportunities, constraints, risks or dependencies associated with each option; and
- A public consultation event was held on 19th June 2019 and was attended by 100 members of the public. The event provided background information about the study, the WelTAG process and the shortlisted options being considered. Attendees were encouraged to complete a questionnaire to obtain views on each of the options. The public consultation event marked the start of a 6-week consultation period during which the questionnaire was made available for completion via the Vale of Glamorgan Council's website. **A total of 295 completed questionnaires were received during the consultation period.**

The results of the consultation are provided in detail in the consultation report in Appendix 17 of the IAR. Some of the common themes highlighted in the consultation responses are summarised below.

The public consultation questionnaire included two closed questions that gave an overall indication of views about each option. The results of the two closed questions are as follows:

1. Respondents were required to rate each option in terms of whether they agreed or disagreed with each option. 77% of respondents stated they 'strongly agree' or 'agree' with Option 1 (Active Travel), compared with 49% for Option 3 (Cogan Interchange) and 32% for Option 2 (Cogan Bus Park and Ride). At the other end of the scale, 56% stated they 'strongly disagree' or 'disagree' with Option 2, compared with 28% for Option 3 and 15% for Option 1; and
2. Respondents were required to rate the options in terms of the extent to which each option will be successful in achieving the objectives. Again Option 1 (Active Travel) was rated most positively and Option 2 (Cosmeston Bus Park and Ride) rated most negatively against all objectives.

The stakeholder workshop and public consultation resulted in a range of views and opinions being gathered on each option. All responses have been reviewed and common themes identified in

relation to each option, which are recorded in detail in Appendix 17 of the IAR. Table 2.2 includes a summary of common themes raised in relation to each option. This summarises feedback from both the stakeholder workshop and the public consultation.

Table 2.2 – Common themes raised through the WelTAG Stage Two consultation

Option	Common Theme
Option 1: Active Travel proposals for the Penarth to Cardiff Barrage Corridor	• Active Travel proposals are not ambitious enough e.g. comments in relation to routes needing to be off-road/ segregated from traffic, whether areas could be pedestrianised, negative comments about on-road cycle lanes; • Support for lower speeds and the introduction of a 20mph limit; • Positive comments in relation to the PHL, but also some concerns expressed in terms of cost and potential environmental impact; • Bike hire scheme should be expanded from Cardiff to Penarth; • Potential offered by electric bikes to address the topography issues in Penarth; • Proposals should include additional links e.g. to Cogan, to other rail stations, to schools; and • Proposals should cover a wider area e.g. links to Sully and to new proposed housing developments to the south of the study area.
Option 2: Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage	• Negative comments and concerns in relation to the introduction of buses onto Cardiff Barrage and the potential negative impact on the traffic-free walking and cycling environment (For example, the public consultation questionnaire asked respondents to provide details of aspects of Option 2 that they particularly like or dislike. In response to this question, a third of respondents made reference to the negative impact to the safe walking and cycling environment should vehicles be allowed on the barrage. The questionnaire also asked respondents to provide additional comments in relation to any of the shortlisted options and many negative comments were received in relation to the introduction of buses on Cardiff Barrage); • Negative comments about the proposed location of the park and ride e.g. potential impact on Cosmeston Lakes Country Park, whether it is the right location/ has a sufficient catchment for a park and ride e.g. will not capture Penarth traffic; and • Proposals, if developed, should encourage the use of electric vehicles e.g. by providing electric vehicle charging infrastructure and using electric buses.
Option 3: Cogan Multi-Modal Sustainable Transport Interchange	• Positive comments in relation to some elements of Option 3 e.g. the Active Travel and accessibility improvements; • Concerns about the location of Option 3 and that the expansion of the park and ride at Cogan will create additional traffic and congestion problems on the local road network; • Proposals are not ambitious enough and should be considered more widely e.g. reference to wider rail proposals to provide a link to the Penarth line, proposals to extend the Penarth line southwards and the need for additional rail capacity. (Consultation with TfW has highlighted that frequency enhancements are included within the TfW programme of works that will benefit Cogan Station i.e. 2 trains per hour between Cardiff and Bridgend via Vale of Glamorgan from December 2023); • Need to consider wider Active Travel improvements e.g. routes to the station, improved crossing of Windsor Road; and • Proposals should encourage the use of electric vehicles e.g. by providing electric vehicle charging infrastructure.

In addition to the common themes raised in relation to each option, there were also more general common themes highlighted through the stakeholder and public consultation that linked to issues wider than the individual options. Common themes raised included the need to consider:

- The area outside/ beyond the WelTAG Stage Two study area;

- A mix of modes and not necessarily one individual option or the other;
- Other studies being progressed across the wider area;
- Proposals for sustainable transport being more ambitious;
- Integrated ticketing; and
- The impact of wider developments such as proposed housing developments to the south of the study area.

Overall, the results from the stakeholder workshop and public consultation showed that:

- Option 1 (Active Travel) was the most well-supported of the three options and received the most positive responses;
- The most negative responses were raised in relation to Option 2 (Cosmeston Bus Park and Ride), particularly in relation to the potential impact that the introduction of buses on Cardiff Barrage could have on the existing walking and cycling route; and
- Overall, results in relation to Option 3 (Cogan Interchange) were more mixed, which could reflect the variety of improvements proposed by Option 3. For example, positive comments were received in relation to the proposed Active Travel and accessibility improvements, with more negative comments received in relation to the potential impact on traffic levels and congestion.

2.8 Option Appraisal

The WelTAG Stage One report included a Strategic Case appraisal of each option against a range of factors using the WelTAG seven-point assessment scale.

The appraisal process included each option being assessed against:

- The objectives of the Wales Transport Strategy, the Local Transport Plan and the Cardiff Capital Region;
- The goals of the Well-being of Future Generations (Wales) Act 2015 and the objectives of local well-being plans; and
- The identified problems and agreed objectives of the WelTAG study.

The WelTAG Stage One report also included an early stage appraisal of the deliverability of each option, which considered potential technical constraints and risks to delivery.

The Strategic Case appraisal of the short-listed options has been reviewed for this WelTAG Stage Two Report to reflect the additional development work that has been undertaken on each option, as described in Section 2.6. The appraisal has been undertaken using the WelTAG seven-point assessment scale, as detailed in Section 1.4. A full record of the WelTAG Stage Two Strategic Case appraisal is included in Appendix 18 (Worksheets 5-9 and 11) of the IAR.

The WelTAG Stage Two appraisal process has involved a more in-depth assessment of the well-being impacts of each option. An assessment has been undertaken of the impact of each option on the well-being goals of the Well-being of Future Generations (Wales) Act 2015. This has identified strengths, weaknesses, opportunities and threats associated with each option in relation to the well-being goals. A more detailed assessment has also been undertaken of how each option benefits the well-being objectives of the Vale of Glamorgan Council and the Vale of Glamorgan's Public Service board. A further assessment has been undertaken of how each option fits with the Welsh Government's well-being objectives as outlined in 'Prosperity for All: The National Strategy', which was not included within the WelTAG Stage One appraisal.[18] The well-being assessment is included within Appendix 19 of the IAR.

The WelTAG Stage Two Strategic Case appraisal has been completed using information that is currently available about each option. It should be noted that although additional development work has been undertaken since the WelTAG Stage One appraisal, the options under consideration continue to be at a relatively early stage of development. As detailed previously, certain elements within the shortlisted options have benefitted from development work having been undertaken by previous studies e.g. in relation to the PHL and the bus route across Cardiff Barrage. In these cases, key aspects such as the proposed design and cost used within the WelTAG Stage Two assessment are based on existing information available from previous studies. The existing studies that have been used to inform the appraisal process are included within Appendices 7 and 13 of the IAR.

The following tables (Tables 2.3 – 2.6) provide a summary of the Strategic Case appraisal of each of the options and supports the detailed assessment that is recorded in Appendix 18 (Worksheets 5-9 and 11) of the IAR.

[18] https://gweddill.gov.wales/docs/strategies/170919-prosperity-for-all-en.pdf

Table 2.3 – Option 1 – Strategic Case Summary Table

Option 1 – Active Travel Proposals for Penarth within the Vale of Glamorgan's Active		
Description	Option 1 comprises a network of Active Travel links within the study area. The links included within the option are those routes within the Vale of Glamorgan Council's Active Travel Integrated Network Map (INM) that are considered to have most benefit to the Penarth to Cardiff Barrage Corridor. The network of Active Travel routes within Option 1 includes the Penarth Headland Link (PHL) proposal, which is a proposed 1km rock-fill causeway between Penarth Esplanade and Cardiff Barrage to provide a shared-use pedestrian and cycle route. The option includes area-wide active travel measures e.g. introduction of a 20mph limit and a bike hire scheme.	
How does it tackle the problem?	Option 1 seeks to improve the attractiveness and accessibility of walking or cycling for everyday journeys, e.g. commuting, and reduce levels of car use. Option 1 has the potential to have a positive impact on all the identified problems i.e. • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; • Lack of park and ride facilities limits opportunities for public transport interchange; • Low levels of Active Travel; • Safety issues act as a barrier to walking and cycling; • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; • Lack of facilities for cyclists at trip origin and destination; • Environmental factors reduce the attractiveness of walking and cycling; • Topography of the area acts as a barrier to walking and cycling; • Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and • Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	
Objectives	Enhance sustainable connectivity throughout the Penarth to Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.	+++
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	+++
	Increase sustainable transport options that improve accessibility along the Penarth to Cardiff Barrage transport corridor and support social inclusion, health and well-being.	+++
	Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment.	++
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	0

<table>
<tr><td>Adverse Impacts and Dependencies</td><td colspan="2">• Environmental impacts of individual schemes and particularly the larger-scale proposals (e.g. PHL) requires detailed consideration during scheme development;
• Ongoing maintenance requirements following delivery of Option 1;
• Availability of Active Travel facilities at key origin/ destination points will be important to increase usage of Active Travel routes e.g. secure bike storage, showers and changing facilities at employment sites – some measures will be reliant on third party implementation; and
• Option 1 requires safe and attractive linkages to destinations outside of the study area e.g. linking into Cardiff Council proposals for Active Travel improvements.</td></tr>
<tr><td>Constraints</td><td colspan="2">• High level of capital investment required to deliver all Active Travel links;
• Environmental considerations due to the location of some proposals e.g. PHL located in the Severn Estuary Special Protection Area, Penarth is a conservation area;
• Potential land ownership issues in relation to some proposals, although many of the proposed improvements are on-highway;
• Difficult to overcome steep topography within Penarth, which could reduce the accessibility of some of the proposed Active Travel routes;
• Constraints of the built environment (e.g. limited space, road width, levels of parking) limits the extent of off-road cycling improvements that can be provided;
• Active travel improvements may have a limited impact on reducing commuting journeys by car;
• Option 1 does not include any potentially attractive routes outside of the Vale of Glamorgan's INM at this stage; and
• A number of challenging and constrained junctions along the routes such as the Plymouth Road/ Stanwell Road junction and Windsor Road/ Windsor Terrace/ Stanwell Road roundabout.</td></tr>
<tr><td rowspan="6">Key Risks</td><td>Feasibility (Technical)</td><td>0</td></tr>
<tr><td>Acceptability</td><td>+</td></tr>
<tr><td>Timescale</td><td>0</td></tr>
<tr><td>Risks</td><td>-</td></tr>
<tr><td colspan="2">It should be noted that the above deliverability appraisal (also refer to Worksheet 11 within Appendix 18 of the IAR) and the key risks identified are influenced to a large extent by the PHL forming part of Option 1, due to its specific complexity. Key risks that relate to the PHL are:
• High cost scheme requiring a high level of capital investment – requires further feasibility and design work to develop a more robust cost estimate;
• Technically complex proposal to design, plan and construct;
• Environmental and ecological considerations associated with the proposal's development and implementation e.g. the Severn Estuary is a site of national and international importance i.e. RAMSAR site, SSSI, SAC, SPA;
• Timescales required by environmental requirements could impact on the programme for delivery e.g. time required to complete the necessary studies, assessments and licensing; and
• Maintenance and operational requirements of the proposal would need detailed consideration.
Other risks (not related to PHL):</td></tr>
</table>

	• There could be a degree of public opposition to some proposals e.g. to introduce cycling on existing pedestrian-only footpaths along the headland, which is a section of the Wales Coastal Path.

Table 2.4 – Option 2 – Strategic Case Summary Table

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage		
Description	This option consists of a bus park and ride and bus priority scheme providing a link along the Penarth to Cardiff Barrage Corridor. The option includes the following elements: • A bus park and ride facility at Cosmeston Lakes Country Park. The proposal would provide approximately 150 park and ride spaces and include a covered waiting area, lighting, CCTV, secure cycle storage and electric vehicle charging infrastructure; • The bus route from the park and ride facility to Cardiff Barrage would travel along the B4267, Westbourne Road, Stanwell Road, Albert Road, Clive Place, St Augustine's Crescent, Paget Place and Paget Road to provide access to Cardiff Barrage; and • Continuation of the bus route across Cardiff Barrage to provide direct access to Cardiff Bay and onto Cardiff City Centre.	
How does it tackle the problem?	Option 2 would provide a bus park and ride transport option between the study area and key trip attractors in Cardiff Bay and Cardiff City Centre. Option 2 has the potential to have a positive impact on the following identified problems: • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; • Lack of park and ride facilities limits opportunities for public transport interchange; • Low levels of Active Travel; • Lack of facilities for cyclists at trip origin and destination; • Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and • Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	
Objectives	Enhance sustainable connectivity throughout the Penarth to Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.	+
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	+
	Increase sustainable transport options that improve accessibility along the Penarth to Cardiff Barrage transport corridor and support social inclusion, health and well-being.	++
	Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment.	+

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage		
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	0
Adverse Impacts and Dependencies	• Environmental impacts would need detailed consideration as the proposal is further developed e.g. due to the location of the bus park and ride at Cosmeston Lakes Country Park; • Importance of Cosmeston Lakes Country Park as an environmental, heritage and visitor attraction – would need to ensure the park and ride proposal does not have a negative impact and conflict with the role and users of the Country Park; • Proposal would reduce overflow parking available for use by visitors to Cosmeston Lakes Country Park; • Implementation of a bus route over Cardiff Barrage may reduce attractiveness of the existing walking and cycling route; • Proposal has the potential to reduce attractiveness of currently operating bus routes (e.g. bus corridor via Windsor Road/ Penarth Road); • Proposed park and ride bus route through Penarth would not enable the main town centre bus stops to be serviced; • Operational nature of the barrage will impact on the feasible frequency of the bus park and ride service; and • Potential ongoing revenue/ operating costs following delivery of the proposal.	
Constraints	• Availability of capital funding required to deliver the proposal; • Environmental and heritage considerations due to the proposed location of the Park and Ride at Cosmeston Lakes Country Park. The area is designated as a SSSI and Local Nature Reserve and is an important breeding ground e.g. for water vole; • The proposed Park and Ride is located within Flood Zone B as outlined within the Vale of Glamorgan's LDP (via the Development Advice Map); • Limited catchment at Cosmeston for a park and ride as will mainly attract users from the Sully and Lower Penarth area (although LDP allocation (Policy MG2(24)) for new housing development at Upper Cosmeston Farm); • Location of proposed park and ride site is some distance from A4055 and will require potential users to divert from the main highway network; • Lack of highway space to implement bus priority measures along route between Cosmeston and Cardiff Barrage will reduce the attractiveness of the service. • A junction improvement will be needed along the proposed bus route to improve the suitability of the route for larger vehicles i.e. Paget Terrace to Paget Road junction; • Proposed route would miss the main alighting point in Penarth town centre (Windsor Terrace); • Potential conflict between buses and existing users (pedestrians and cyclists) of Cardiff Barrage; • Potential land ownership issues, e.g. the bus route across the Barrage may require crossing third party land;	

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage		
	• Under the Barrage Act, water traffic has priority over road traffic to enter/ exit the Cardiff Barrage. This would limit the frequency of bus services that can be provided over Cardiff Barrage; and • The bus park and ride service may need to operate as a supported service on an ongoing basis.	
Key Risks	Feasibility (Technical)	0
	Acceptability	-
	Timescale	0
	Risks	-
	• High level of capital investment needed to deliver the proposal; • Potential for public opposition to the introduction of buses onto Cardiff Barrage and the siting of the park and ride facility at Cosmeston Lakes Country Park; • Development of the park and ride facility likely to require development of a greenfield site; • Technical and operational challenges relating to the introduction of buses on Cardiff Barrage; • Need to ensure the design of the bus route does not have a negative impact on the walking and cycling route over Cardiff Barrage; • Land issues linked to the bus route alignment along Cardiff Barrage e.g. preferred route option may require Association of British Ports (ABP) agreement as subject to national port security regulations, alternative route option is within Welsh Government ownership; • Cardiff Barrage is under the control of Cardiff Council and implementation of the Barrage element of the option would need to be led by Cardiff Council; and • Potential ongoing revenue costs linked to the operation/ subsidisation of the bus service.	

Table 2.5 – Option 3 – Strategic Case Summary Table

Option 3 - Multi-Modal Sustainable Transport Interchange		
Description	Option 3 comprises a range of improvements to Cogan Station to create a multi-modal interchange facility and improve integration between rail and other transport modes. This includes the development of vacant land to provide an expanded park and ride facility with approximately 150 spaces, on-station improvements including an Access for All bridge over the rail line and improvements to Active Travel links and facilities.	
How does it tackle the problem?	Option 3 would provide multi-modal interchange opportunities at Cogan Station and aim to increase rail use for everyday journeys. Option 3 has the potential to have a positive impact on the following identified problems: • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Lack of park and ride facilities limits opportunities for public transport interchange; • Low levels of Active Travel; • Safety issues act as a barrier to walking and cycling; • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; • Lack of facilities for cyclists at trip origin and destination; and • Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	
Objectives	Enhance sustainable connectivity throughout the Penarth to Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.	+
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	++
	Increase sustainable transport options that improve accessibility along the Penarth to Cardiff Barrage transport corridor and support social inclusion, health and well-being.	+
	Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment.	++
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	+
Adverse Impacts and Dependencies	• The impact of the proposal on the local highway network would need detailed consideration during the development of the scheme e.g. increased parking availability at Cogan Station could increase congestion on the A4160 Cogan Hill/ Windsor Road and at Barons Court junction, impact on air quality as previously an AQMA on Windsor Road; • Current active travel journeys to the station may be replaced by private car if parking is made more readily available; • TfW planned improvements at Cogan Station need consideration during scheme development (refer to Appendix 14);	

Option 3 - Multi-Modal Sustainable Transport Interchange		
	• Wider development proposals need consideration during the development of the proposal e.g. previous proposals for housing development on the proposed park and ride site, other development proposals in the area such as the new Wellbeing Hub on the Penarth Leisure Centre site; • Proposal will not benefit those wishing to interchange onto/ from the Penarth branch line; • Dense nature of the urban environment would need to be considered and the impact of construction on local communities; and • Ongoing revenue/ operating costs following delivery of the proposal.	
Constraints	• High capital investment needed to deliver the proposal; • Constraints of the site may impact on the package of measures that can be delivered; • Proposal would require access/ egress onto the busy A4160 – potential for future traffic increases at the Andrew Road junction due to the proposed expansion of Penarth Leisure Centre to include a Wellbeing Hub; • Constrained nature of the local road network and topographical constraints may limit the extent of highway and access improvements that can be delivered e.g. at Cogan Hill roundabout; • Topography/ levels of the area purchased by Welsh Government for potential development i.e. the proposed park and ride site; • Listed status of existing footbridge over the rail line; • Capacity of existing rail services on the Vale of Glamorgan line, although frequency improvements planned by TFW (refer to Appendix 14); and • Current proposal will need to accommodate movements from the operational Travis Perkins site.	
Key Risks	Feasibility (Technical)	+
	Acceptability	0
	Timescale	+
	Risks	0
	• Option is at a very early stage of development – further development and design work required to develop a more robust cost estimate and to better understand the impact of the proposed scheme on the local highway network; • High level of capital investment needed to deliver the proposal; • Technical challenges in delivering improvements on operational railway land and due to levels/ topography of the site; • Involvement of different parties in progressing the proposal i.e. Welsh Government leading on land purchase, rail elements will need to be progressed and delivered by Transport for Wales, Vale of Glamorgan Council has responsibility for the local highway network; • An Air Quality Management Area has previously been in place along a section of Windsor Road – need to ensure the proposal would not have a negative impact on local air quality; and • Further scheme development may result in a proposal that requires land acquisition.	

Table 2.6 – Option 4 – Strategic Case Summary Table

Option 4 - Do Minimum		
Description	This option involves undertaking no investment in new transport infrastructure and no dedicated sustainable transport improvements in the area, except from routine maintenance as and when required to keep routes operational.	
How does it tackle the problem?	The do minimum approach is likely to see existing problems become worse in the long term. It is not envisaged that this option would assist with tackling any of the identified problems.	
Objectives	Enhance sustainable connectivity throughout the Penarth to Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.	--
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	--
	Increase sustainable transport options that improve accessibility along the Penarth to Cardiff Barrage transport corridor and support social inclusion, health and well-being.	--
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	--
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	-
Adverse Impacts and Dependencies	• A do minimum approach would likely see identified problems become worse, particularly due to the planned future developments within the Vale of Glamorgan, as well as predicted increase in the population of the Cardiff Capital Region.	
Constraints	• No constraints identified as the do minimum approach assumes that no sustainable transport improvements are delivered.	
Key Risks	Feasibility	0
	Acceptability	--
	Timescales	0
	Risks	0
	A do minimum approach assumes that no sustainable transport improvements are delivered and has therefore not been rated in terms of technical feasibility, timescales and risk. This option has a negative rating in terms of acceptability, as a do minimum approach and a subsequent worsening of identified problems is unlikely to be an acceptable long-term option.	

2.9 Summary of the Strategic Case

The Strategic Case was originally developed and presented at WelTAG Stage One. A review of the Strategic Case at WelTAG Stage Two has confirmed that the policy context, case for change, identified problems and study objectives remain current. The WelTAG Stage Two Strategic Case includes details of option development work and additional consultation activities that have been undertaken as part of WelTAG Stage Two to inform the appraisal process. The Strategic Case has considered the adverse impacts, dependencies, constraints and risks of each option, which are considered further in Chapter 3: Transport Case and Chapter 6: Management Case.

The Strategic Case has appraised the three short-listed options against a number of national, regional and local policy objectives to assess their suitability and strategic fit as potential solutions. Each option has also been assessed against the five study objectives and its ability to address the identified problems. This appraisal provides an update to the previous appraisal undertaken at WelTAG Stage One and reflects the additional option development work that has been undertaken.

Table 2.7 provides a summary of the results of the appraisal and this is also included within Appendix 18 (Table 12) of the IAR. A detailed record of the assessment is provided in Appendix 18 (Tables 5-9 and 11) of the IAR.

All three options performed well against the goals of the Well-being of Future Generations (Wales) Act 2015, with Option 1 (Active Travel) performing most positively overall. All three options were assessed as having a mostly positive or neutral impact on existing policy objectives at the national, regional and local level. Option 1 (Active Travel) performed most positively out of the three options in relation to the WTS objectives, national and local well-being objectives and the objectives of the Cardiff Capital Region. Only Option 2 (Cosmeston Bus Park and Ride) recorded 'slight negative' ratings in this section of the appraisal. These negative ratings were in relation to objectives that aim to protect the environment, enhance heritage, culture and biodiversity. The negative ratings relate to the potential impacts of the proposal on Cosmeston Lakes Country Park and the existing Active Travel route along Cardiff Barrage.

All three options performed well against the five study objectives and in addressing most of the identified problems within the study area. Again Option 1 (Active Travel) was assessed as performing the best against the study objectives and identified problems. The only 'slight negative' recorded in this section of the appraisal was in relation to Option 2 (Cosmeston Bus Park and Ride) and the identified problem that 'safety issues act as a barrier to walking and cycling'. This negative rating was in relation to the potential impact of introducing buses onto Cardiff Barrage on the perceived safety of pedestrians and cyclists using the route.

In general, and as presented in the WelTAG Stage One appraisal, the do minimum option did not perform well in the appraisal. A do minimum approach is likely to result in a worsening of existing problems and was assessed as having a negative impact on many policy objectives, in addition to the study objectives. The long-term impact of a do minimum option will adversely affect the goals of the Well-being of Future Generations (Wales) Act 2015.

Overall Option 1 (Active Travel) performed most positively throughout the appraisal. Option 3 (Cogan Interchange) also performed well and recorded a positive or neutral impact throughout

the appraisal. The outcomes of the Strategic Case appraisal will inform the Transport Case, Management Case and the recommendations of this WelTAG Stage Two Report.

Table 2.7 – Summary of Option Appraisal

Appraisal Criteria		Option 1 Active Travel proposals for the Penarth to Cardiff Barrage Corridor	Option 2 Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Option 3 Cogan Multi-Modal Sustainable Transport Interchange	Option 4 Do Minimum
Wales Transport Strategy Outcomes	Social	++	+	++	-
	Economic	++	++	++	--
	Environmental	++	0	+	-
WBOFGA Goals		++	+	+	-
Welsh Government Well-being Objectives		+	0	+	-
Local Transport Plan Objectives		++	++	++	-
Cardiff Capital Region Strategic Objectives		++	+	+	-
Scheme Objectives	1	+++	+	+	--
	2	+++	+	++	--
	3	+++	++	+	--
	4	++	+	++	--
	5	0	0	+	-
Tackling Problems		++	+	+	--
Appraisal Summary Table	Economic	+	0	+	-
	Environmental	0	-	0	-
	Social & Cultural	++	0	+	-
	Public Accounts	--	--	-	-
Delivery		0	0	+	-

Scheme Objectives:

1 = Enhance sustainable connectivity throughout the Penarth to Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.
2 = Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.
3 = Increase sustainable transport options that improve accessibility along the Penarth to Cardiff Barrage transport corridor and support social inclusion, health and well-being.
4 = Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.
5 = Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.

3. Transport Case

3.1 Overview

As detailed in WelTAG 2017, 'the Transport Case tells you what the expected impacts of the project are, how the project will contribute to the well-being goals and whether a project will provide value for public money. This is calculated by thinking about social, cultural, environmental and economic costs and benefits of each option.'

The Transport Case is an evidence-based assessment of:

- What the impacts will be;
- The scale of those impacts;
- Where and when they will occur; and
- Who/what will experience them.

The Transport Case for the WelTAG Stage One report was developed in line with WelTAG 2017 that states 'at Stage One, the assessments of the impacts are likely to be mainly qualitative with indications provided of the numbers of people affected. Much of the evidence used will come from existing data sources and evaluations of relevant previous projects elsewhere.'

In relation to the Stage Two Transport Case, WelTAG 2017 states that 'During Stage Two, the level of quantification of the impacts should increase for those impacts which are relevant to the decisions that need to be made.'

3.2 Capital Costs

The WelTAG Stage Two process has involved the development of preliminary capital cost estimates for each of the options under consideration. Table 3.1 provides a summary of the cost estimate for each option, provides details of assumptions made and elements that have and have not been included within the cost estimates. Further detail about the capital cost estimates developed for the WelTAG Stage Two Report are provided in Appendix 20 of the IAR. At this stage all cost estimates are preliminary in nature, which reflects the current stage of development of each of the options. As detailed previously, where preliminary cost estimates have been obtained from previous studies, no detailed review has been undertaken of the cost estimates or the designs on which they are based, for the purposes of this WelTAG Stage Two study.

Table 3.1 – Cost Estimate Summaries of Each Shortlisted Option

Option	Description of elements costed	Source of cost estimate	Information to support cost estimate	Capital cost estimate
Option 1 - Active Travel proposals for the Penarth to Cardiff Barrage Corridor	Network of Active Travel routes (not including PHL) as detailed in Section 2.6 and Appendix 9 of the IAR. Cycle hire scheme in the Penarth area – potentially to include 11 cycle hire locations as detailed in Appendix 10. (The proposed 20mph limit is excluded from the cost at this stage as an area for the 20mph limit has yet to be defined.)	Cost estimate of the network of Active Travel routes has been developed for this WelTAG Stage Two Report. Cost estimate of the bike hire scheme provided by Vale of Glamorgan Council.	Network of Active Travel routes: • Construction cost estimate only – no contingency included for design fees or costs for statutory processes e.g. TROs; • Estimate makes no allowance for land costs, ground conditions/ contamination or statutory undertakers equipment (existing or proposed); • Estimate does not include the cost of implementing a 20mph limit; • Estimate does not include any allowance for alterations to traffic signals; • Estimate includes 44% optimism bias due to early design stage; and • Cost estimate is rounded up to nearest £10k.	£0.85M

Option	Description of elements costed	Source of cost estimate	Information to support cost estimate	Capital cost estimate
Option 1 - Active Travel proposals for the Penarth to Cardiff Barrage Corridor	PHL - a proposed 1km rock-fill causeway between Penarth Esplanade and Cardiff Barrage to provide a shared-use pedestrian and cycle route.	Lower range preliminary cost estimate provided in report of Penarth Headland Link Group (2018)[19] and referenced in an earlier Arup (2016) report.[20] Higher range preliminary cost estimate provided in Arup (2018) report.[21]	• A preliminary cost estimate range has been used to reflect the existing cost information available from previous studies and the early stage of scheme development; • Lower cost estimate of £10M assumed to be a 2016 estimate due to the earliest source report; • Higher cost estimate of £16.6M is based on the original cost estimate of £10M with the addition of 66% optimism bias as detailed in the Arup (2018) report; • Cost estimate based on an 'outline concept design' and assumes a causeway structure for the PHL, in line with the requirements of the Cardiff Bay Barrage Act 1993; and • No detailed review of the available preliminary cost estimates has been undertaken for this WelTAG Stage Two Report.	£10M - £16.6M

[19] Penarth Headland Link Feasibility Report – Issued for the briefing of Consultants, Penarth Headland Link Group, February 2018
[20] Penarth Headland Link Outline Economic Impact Assessment, Arup, February 2016

Option	Description of elements costed	Source of cost estimate	Information to support cost estimate	Capital cost estimate
Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Bus park and ride facility at Cosmeston Lakes Country Park to provide: • Approximately 150 park and ride spaces and includes lighting, CCTV and electric vehicle charging infrastructure (10% of spaces); • Internal access improvements into the site to accommodate bus access and turning area; • A covered waiting area and ticket machine; • Secure cycle storage; • SUDs requirements; and • Carriageway realignment at the Paget Road/ Paget Terrace junction.	Cost estimate has been developed for this WelTAG Stage Two Report.	• Construction cost estimate only – no contingency included for design fees; • Estimate makes no allowance for land costs, ground conditions/ contamination or statutory undertakers equipment (existing or proposed); • Includes 44% optimism bias due to early design stage; and • Cost estimate is rounded up to nearest £10k.	£6.4M
	Bus route across Cardiff Barrage including: • Measures to segregate vehicles and pedestrians/ cyclists on the barrage; • Upgraded barrier controls and new automated bollard systems on the bascule bridge section of the barrage; and • The construction of a new section of 'busway' at the northern end of the barrage to link into the existing highway network in Cardiff Bay.	Preliminary cost estimate included in Cardiff Bay Barrage Transport Link Feasibility Report (Arup, 2015)	• 2015 cost estimate; • Cost estimate is based on preliminary assessments of infrastructure costs for the bus route; • Estimate is based on the highest cost option for a bus route alignment at the northern end of the barrage i.e. on Welsh Government land; • Estimate does not include two specific contingency costs included in 2015 report i.e. for overlaying the embankment road and for provision of bus priority measures elsewhere on the bus route; and	£3.2M

[21] Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup, October 2018

Option	Description of elements costed	Source of cost estimate	Information to support cost estimate	Capital cost estimate
			• The cost breakdown and additional caveats (from the 2015 Arup report) that should be noted in relation to the estimate are included in Appendix 13 of the IAR.	
Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	Improvements to Cogan Station to create a multi-modal interchange facility as detailed in Section 2.6. Cost estimate includes: • The development of vacant land to provide an expanded park and ride facility with approximately 140 spaces and includes lighting, CCTV, electric vehicle charging infrastructure (10% of spaces) and SUDs requirements; • Provision of 10 disabled spaces and taxi/drop-off area; • On-station improvements including an Access for All bridge over the rail line, ticket machine, toilets and new shelters • Improvements to existing highway access onto the site from A160 Windsor Road; • Covered/secure cycle storage; and • Active Travel improvements into the site i.e. segregated pedestrian footway into the site from main Windsor Road access, improvements to pedestrian routes to nearby bus stops to south of the site, improvements to existing Cogan Hill roundabout crossing point.	Cost estimate has been developed for this WelTAG Stage Two Report.	• Construction cost estimate only – no contingency included for design fees; • Estimate makes no allowance for land costs, ground conditions/ contamination or statutory undertakers equipment (existing or proposed); • Includes 44% optimism bias due to early design stage; and • Cost estimate is rounded up to nearest £10k.	£6.49M

3.3 Monetarised Benefits

This section describes the methodology used to appraise each option in economic terms and presents the appraisal findings. The economic assessment has been undertaken in accordance with Welsh Government Transport Appraisal Guidance (WelTAG) and Department for Transport Appraisal Guidance (WebTAG).

3.3.1 Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor

Option 1 comprises a package of relatively small-scale Active Travel improvements and the PHL proposal, which is a large-scale engineering project. Due to the difference in the scale and nature of the PHL in comparison to the other proposals within Option 1, the economic assessment has considered two variations in relation to Option 1:

- Option 1A – Penarth Active Travel Network – This includes all proposals within Option 1 other than the PHL; and
- Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor – This is Option 1 as originally defined i.e. all proposals within Option 1 including the PHL.

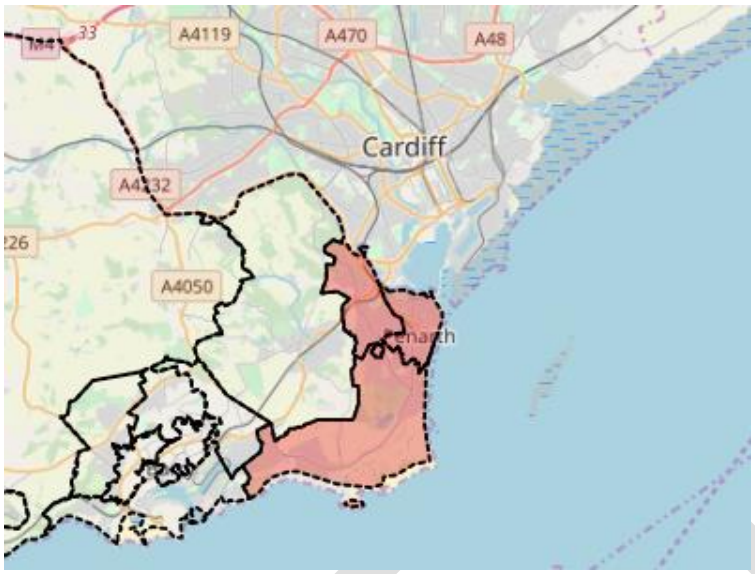
At this stage, the proposed introduction of an area-wide 20mph limit has not been considered by the economic assessment. This is due to the cost of a proposed 20mph limit not being included within Option 1 at this stage, as an area for the 20mph limit has yet to be defined.

Option 1A – Penarth Active Travel Network

Existing Transport Demand

A base-line existing transport user demand has been established in order to quantify the number of existing transport users that may benefit from the implementation of Option 1A. This has been done using the National Trip End Model (NTEM) which provided an estimated number of walking and cycling trips for Penarth and the immediately surrounding areas as illustrated in Figure 3.1.

Figure 3.1 – National Trip End Model



The existing number of walking and cycling trips in Penarth and the immediately surrounding areas is provided in Table 3.2.

Table 3.2 – Existing Walking and Cycling Trips in Penarth and Immediately Surrounding Areas

Mode	Number of Daily Trips
Walking	2,189
Cycling	468

Forecast Transport Demand

The forecast transport user demand, following the implementation of Option 1A, has been estimated in order to calculate the number of new users that will benefit from the associated infrastructure enhancements.

Walking

A mode share comparison was undertaken to provide a forecast for the increase in walking. The next highest mode share proportion for walking within the Vale of Glamorgan (Llantwit Major and Rhoose ward) was used as a mode share target for walking as it provides a realistic increase within the context of travel in the Vale of Glamorgan. This resulted in an increase in mode share for pedestrian trips from 23.1% to 23.6% (0.5%) and an increase of 48 pedestrian trips per day.

The NTEM forecast indicates that the mode share for walking and cycling in the Penarth area will reduce marginally between now and 2051. As such the proposed increase in demand highlighted above will increase active travel mode share marginally above the 0.5% identified. This is considered to be a realistic estimate for the increase in walking trips based on the relatively minor improvements proposed.

Cycling

An adapted version of the sketch plan method specified in WebTAG Unit A5.1 (Active Mode Appraisal) has been used to forecast the increase in cycle trips as a result of the infrastructure improvements in Option 1A. This involves applying an approximate elasticity estimate for change in demand for cycling in a district based on a change in the proportion of route that has facilities for cycle traffic. The WebTAG method specifies an elasticity of 0.05 for improved cycle facilities such as cycle lanes and bus lanes. This methodology has used a lower elasticity value of 0.03 to account for the lower level of cycle infrastructure provision provided within the Option 1A proposals. This results in an increase of 5% in cycle trips which calculates to an additional 21 trips per day.

The forecast number of walking and cycling trips in Penarth and the immediately surrounding areas as a result of Option 1 is provided in Table 3.3.

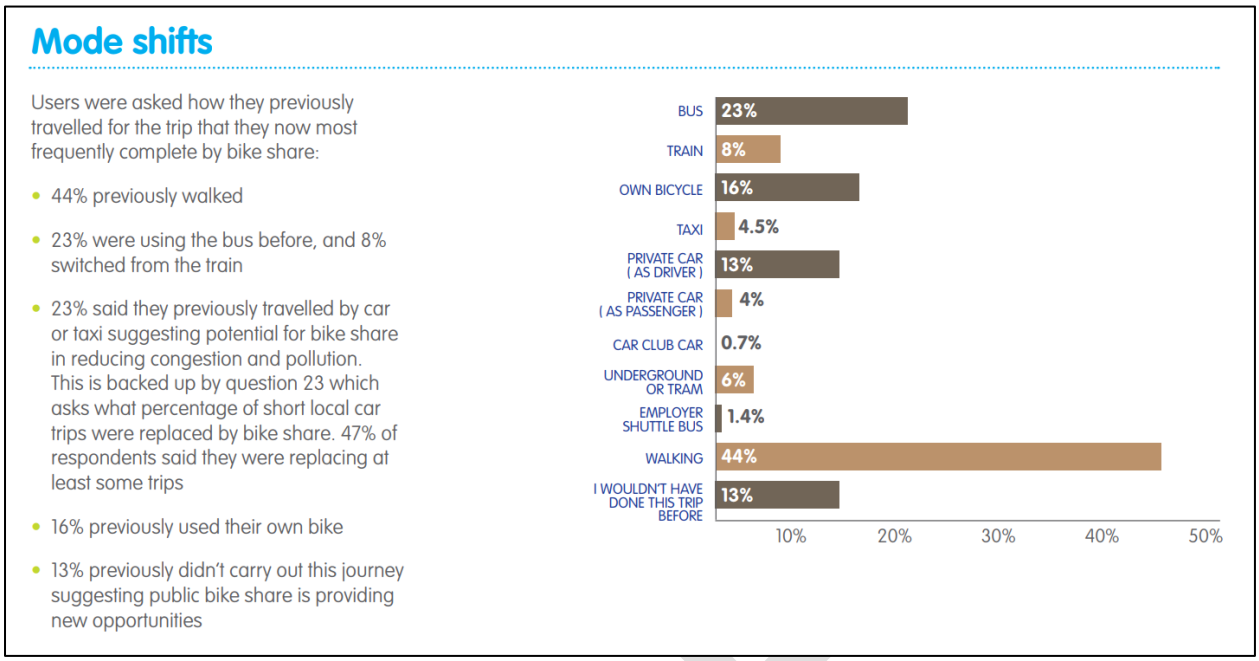
Table 3.3 – Forecast Walking and Cycling Trips in Penarth and Immediately Surrounding Areas – Option 1

Mode	Number of Daily Trips
Walking	2,189 (zero change)
Cycling	588 (+120)

The increase in cycle trips as a result of the proposed Cycle Hire Scheme has been estimated based on the proposed number of bikes provided and an estimate of the number of trips each bike will make per day. It is proposed that a docking station of six bicycles is provided at 11 strategic locations within Penarth and the surrounding areas amounting to a total of 66 bicycles. Review of the Cardiff and Brighton cycle hire schemes indicated that each bike can make between two and five trips per day respectively. A daily trip rate of 1.5 trips per bike has been used to calculate the trips associated with Option 1A to account for the lower level of population density in Penarth and the immediately surrounding areas. The resulting number of trips estimated per day is 99.

A review of Cycle Hire Scheme case studies in the UK was undertaken to understand the impact upon sustainable transport, and the likely benefit that it may generate. It was found that while the cycle hire scheme may generate additional cycle trips, it can also lead to a decline in walking trips. A mode shift survey undertaken by BikePlus identified the following transfer in transport mode by cycle scheme users.

Figure 3.2 – BikePlus Cycle Scheme Mode Shift



Utilising the findings of the BikePlus Cycle scheme mode shift survey it is estimated that of the 99 daily cycle hire trips 38 trips are transferred from public transport, 18 trips are from the car and 44 from walking trips. It can also be calculated that the scheme would result in 69 new trips or trips that would otherwise have been undertaken using a sedentary mode i.e. from the private car or public transport.

As the cycle hire scheme is expected to reduce walking trips, and the proposed infrastructure improvements are anticipated to increase walking trips a net change in walking trips of zero has been used within the economic impact assessment.

Transport Benefits

The transport benefits associated with existing walking trips, and existing and new cycling trips have been calculated and are presented below. A zero-net change in walking trips has been used within the economic analysis and therefore there is no benefit from new walking trips.

Journey Quality

Economic benefit in terms of journey quality has been calculated for existing walking trips using WebTAG Databook journey quality values. No journey quality benefit has been calculated for cycling trips due to the small-scale cycling improvements proposed.

The journey quality benefit values specified in WebTAG databook are presented in Table 3.4. Only the benefits associated with 'information panels' and 'directional signage' have been included within the journey quality benefit assessment to account for the small-scale improvements proposed.

Table 3.4 – WebTAG Databook Journey Quality Values (2010 prices)

Scheme Type	Value p/km
Street lighting	3.7
Kerb level	2.6
Crowding	1.9
Pavement evenness	0.9
Information panels	0.9
Benches	0.6
Directional signage	0.6

The existing walking trips that are likely to use the walking network defined within Option 1A and benefit from the proposed improvements has been estimated by assuming that 30% of all existing walking trips occur on the routes identified within Option 1A. This is based on the fact that the routes identified within Option 1A account for approximately 11% of the road network within Penarth and the surrounding area, and that the routes are on the more highly trafficked roads within the network. The parameters defined above result in a forecast of 657 walking trips per day utilising the routes defined within Option 1A. An average walking trip distance of 1km has been used within the assessment. This is based on the National Travel Survey which found that the mean distance for walking trips in Wales is 1100 metres.

The journey quality benefits presented above have been applied to the estimated number of walking kilometres that will benefit from the option improvements. The 60-year Net Present Value (NPV) of the walking journey quality benefits amounts to **£205,741** in 2010 prices.

Physical Benefits

Physical benefits have been calculated for users associated with the new cycle trips forecast. This has been done using the World Health Organisation (WHO) Health Economic Assessment Tool (HEAT) programme. The HEAT programme estimates the value of reduced mortality that results from specified amounts of walking or cycling. No benefit has been calculated for walking trips as a zero net increase in walking trips has been assumed.

The number of cyclists undertaking new trips or trips that would have otherwise been undertaken using a sedentary mode has been calculated by adding the new trips forecast from the infrastructure improvements to the new trips forecast as a result of the cycle hire scheme. This amounts to a total of 90 cycle trips per day. An average trip length of 2 miles has been used. This is based on Brighton's BTN BikeShare scheme case study[22] which found that after the first year of the scheme 55,000 registered users made approximately 350,000 trips covering approximately 700,000 miles.

The physical benefit calculated using the parameters specified above resulted in a 60-year NPV benefit of **£1,370,600 (2010 prices)**.

[22] https://ec.europa.eu/transport/themes/urban/cycling/guidance-cycling-projects-eu/cycling-measure/bicycle-sharing_en

Marginal External Cost Savings

Marginal external cost savings are savings gained as a result of car trips taken off the highway network and include congestion relief, accident reduction and greenhouse gas reduction. The WebTAG databook values for marginal external benefits are presented in Table 3.5.

Table 3.5 – Physical Benefits (2010 prices)

Dis/Benefit	£p/km
Congestion	10.08
Infrastructure	0.08
Accident	1.62
Local Air Quality	0.10
Noise	0.11
Greenhouse Gases	0.86
Indirect Taxation	-4.68
Total	8.17

The Marginal external cost savings associated with Option 1A have been calculated by applying the benefit and dis-benefit values presented above to the vehicle kilometres forecast to be removed from the highway network. The additional cycle trips forecast above and an average cycle trip length of two miles (3.22 Km - based on the Brighton BTN BikeShare scheme case study described above) have been used to calculate the vehicle kilometres taken off the highway network. The resulting 60-year marginal external cost saving NPV is **£519,838 (2010 prices).**

Costs

A cost estimate has been produced for each element of the Option 1A route improvements, and a fixed budget of **£300,000** is proposed for the Cycle Hire Scheme. The 2019 price scheme costs estimates are presented below as well as the 2010 discounted value. A breakdown of the cost estimate for Option 1A is provided in Appendix 20. It should be noted that the fixed budget of £300K for the cycle hire scheme is based on developer contribution funding that is available and will be used to pay for the scheme.

Capital Investment Costs

Table 3.6 – Capital Investment Costs

Scheme Element	2019 Prices	2010 Discounted Price
INM Route Improvements	£540,623	£317,144
Cycle Hire Scheme	£300,000	£175,988
Total	£840,623	£493,132

Operational and Maintenance Costs

Operating and maintenance costs for the INM route improvements are assumed to be subsumed within local authority maintenance costs. It has been assumed that the operation and maintenance costs associated with the Cycle Hire scheme will be met the cycle hire provider.

In light of the above no operating or maintenance costs have been factored into the economic assessment of Option 1A.

Value for Money Assessment

The Benefit to Cost Ratio (BCR) has been calculated for Option 1A. The categories recognised by government and used in this assessment are presented in Table 3.7.

Table 3.7 – BCR Value for Money

BCR Value	Value for Money
Less than 1	Poor VfM
Between 1.0 and 1.5	Low VfM
Between 1.5 and 2.0	Medium VfM
Between 2.0 and 4.0	High VfM
Greater than 4.0	Very high VfM

The benefit to cost ratio (BCR) calculated for Option 1A is **6.61** (Very High). Option 1A appraisal tables, including the Analysis of Monetised Costs and Benefits (AMCB) Table, Public Accounts (PA) Table and the Transport Economic Efficiency (TEE) Table are provided in Appendix 21 of the IAR.

Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor (includes Penarth Headland Link (PHL))

The economic impact of Option 1 builds upon the economic impact analysis of Option 1A by incorporating the forecast costs and benefits associated with the Penarth Headland Link (PHL) proposal.

Existing Transport Demand

No existing transport demand has been calculated for the PHL.

Forecast Transport Demand

The forecast transport demand associated with Option 1A has been retained within Option 1.

Forecast transport demand associated with PHL is based on a Route User Intercept Survey (RUIS) undertaken by Sustrans in February 2018[23], a scheme impact assessment of PHL undertaken by ARUP in 2018[24] and a 2014 Non-Motorised User (NMU) survey on Cardiff barrage. It should be noted that the demand forecasts for Option 1 are based on existing survey information and that no primary survey data has been collected as part of this WelTAG Stage Two study. It should also be noted that the Sustrans survey results are based on a low sample rate and should therefore be treated with caution. However, in the absence of a more comprehensive site-specific survey, the Sustrans survey results are considered to be the most relevant to the PHL proposal and local transport context. It is recommended that a comprehensive travel survey is undertaken as part of

[23] Penarth Headland Economic Impact study, Sustrans, April 2018
[24] Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup, October 2018

future scheme development to gain a better understanding of what the likely demand for the PHL will be.

The RUIS survey undertaken by Sustrans in February estimated an annual volume of 342,000 cycling trips and 622,000 walking trips. This estimate was further validated by cross-checking with an older pedestrian survey undertaken on Cardiff barrage in 2014 and was found to match well.

The forecast use of PHL has been estimated based on the intercept survey undertaken by Sustrans which found that 64% of respondents would 'always' use the new link and 35% would use the link 'sometimes'. The existing usage estimate has been multiplied by 64% and 50% to account for daily variation and people who would always use the link, and by 35% and 10% to account for occasional use by people who would use the link 'sometimes'. This results in 220,810 pedestrian trips and 121,410 cycle trips utilising the new link every year.

A sensitivity test whereby only 50% of users would always use the link has also been utilised to address the uncertainty associated with the Sustrans survey. This results in 177,270 pedestrian trips and 97,470 cycle trips using the new link every year.

Future demand has then been calculated by applying an uplift of 50% to the current demand on the barrage. This is based on a study undertaken by Arup in 2018 which analysed the impact of a number of cycle and walking infrastructure schemes. This results in a demand of 331,215 pedestrians and 182,115 cyclists annually, or 907 pedestrians and 498 cyclists per day (average).

Based on first principles, it is estimated that 30% of existing cycle trips generated within Penarth and the immediately surrounding areas are forecast to use the PHL instead of other local routes. This is based on the catchment area that the PHL will serve.

Transport Benefits

The benefits derived from the implementation of the Cycle Hire Scheme and the Active Travel improvements in Option 1A have been retained within Option 1.

The transport benefits associated with the trips that will be undertaken on PHL are presented below.

Journey Quality

Journey quality benefits have been attributed to the cycling trips that have transferred from local routes to PHL.

The journey quality benefit taken from the WebTAG databook is 7.03 pence per minute for the provision of a segregated cycle track. The benefit has been attributed to 140 trips (30% of the total cycle trip production) of 1km in length (approximate length of PHL) travelling at 12mph.

The results in a 60-year journey quality benefit NPV of **£671,566** in 2010 prices.

Physical Benefits

The physical benefits experienced by users of PHL have been attributed to the forecast volume of pedestrian and cycling trips identified above. Each walking and cycling trip is assumed to be 1km in distance. The physical benefit has then been calculated using the WHO HEAT programme. The resulting benefit is presented in Table 3.8.

Table 3.8 – 60 Year Physical Activity Benefit (2010 prices)

Mode	£
Walking	12,460,000
Cycling	2,269,500
Total	14,729,500

Marginal External Benefits

Marginal external benefits have been calculated for the trips which have been taken off the highway network as a result of the implementation of PHL. 20% of the future cycle trips associated with the PHL are assumed to be utility related (e.g. trips that access local facilities and services within Penarth or Cardiff Bay) and therefore trips that are likely to be undertaken by car on the local highway network. This is marginally over double the value in the Sustrans survey to account for the low number of cyclists interviewed and the increased utility associated with cycling. The application of the above parameters results in 33 trips per day taken off the highway network. A distance of 5.4 miles (8.7 Km), which is the distance from Penarth to Cardiff, has been used for each trip. The benefit associated with the car trips transferred to walking trips has been calculated assuming a 9% utility related trip proportion, as identified in the Sustrans survey. This results in 27 trips undertaking a trip distance of 1 km (based on approximate distance of PHL).

The WebTAG databook values used in the assessment are presented in Table 3.5. The resulting 60-year marginal external benefit NPV discounted to 2010 prices is **£1,085,616**.

Wider Economic Benefits

In addition to the direct transport user economic benefits generated by a scheme there are a number of other wider economic benefits that may be generated such as leisure and tourism benefits, employment and opportunity benefits or an increase in land value.

It is considered that PHL will not have a significant impact upon employment and opportunity or land value in the immediate area. However, it is likely to impact upon leisure and tourism. As such an assessment of the leisure and tourism impact of PHL has been undertaken. This has been done by multiplying the estimated daily expenditure of tourists with the forecast demand. A daily tourist expenditure of £26.86 for non-home based tourist visits has been used (based on Sustrans RUIS survey), and a nominal daily expenditure value of £10 per family of four (£2.50 per trip) for home based recreational trips. This results in an annual tourism and leisure expenditure of £370,590, and a discounted 60-year appraisal NPV of **£9,816,757 (2010 prices)**.

Under the sensitivity test circumstances the NPV of the tourism and leisure related expenditure is **£7,881,059.**

It should be noted that the wider economic benefits associated with leisure and tourism are based on a low sample survey results and high-level estimates. It should also be noted that the leisure and tourism benefits identified could be displaced from elsewhere in the county or region. There may also be additional wider economic benefits associated with PHL such as user welfare benefits.

In light of the above, the benefits identified within the wider economic assessment have been included within the adjusted BCR assessment only.

It is recommended that a detailed wider economic assessment of PHL is undertaken as part of future scheme development, to understand the true wider economic impact of the scheme.

Costs

The Cycle Hire Scheme and the Active Travel route improvement cost estimates from Option 1A have been retained within Option 1.

Capital Investment Costs

A range of cost estimates have been used for the PHL scheme based on cost estimates available from previous studies. The source of the cost estimates is detailed in Section 3.2. It should be noted that the cost estimates are preliminary and no detailed review has been undertaken as part of the WelTAG Stage Two process of the available cost estimates or the proposed design on which they are based. The cost estimate values are presented in Table 3.9.

Table 3.9 – PHL Cost Estimates

Estimate	2018 Prices	2010 Prices
Low Cost Estimate	10,000,000	5,982,581
High Cost Estimate	16,600,000	9,931,085

Operational and Maintenance Costs

A general benchmark operational and maintenance cost of 20% of the intervention cost to occur every 20 years has been used within the economic analysis. This is also based on previous cost estimate work undertaken, has been discounted to 2010 prices in accordance with WebTAG and ranges between **£0.9M** and **£1.5M** for the low and high cost estimates respectively.

Value for Money Assessment

An Option 1 BCR has been produced for the core assumptions, an adjusted BCR has been produced which includes the wider economic impact benefits, and a BCR has been produced for the high and low cost estimates for the PHL. A sensitivity test BCR has also been produced which takes account of a potentially lower use of the PHL. BCR values are presented in Table 3.10.

Table 3.10 – Option 1 BCR Values

Scenario	Core BCR	Sensitivity Test BCR
Core Scenario & low cost estimate	2.50	2.04
Core Scenario & high cost estimate	1.53	1.25
Adjusted BCR Scenario & low cost estimate	3.86	3.13
Adjusted BCR Scenario & high cost estimate	2.37	1.92

The BCR values presented in Table 3.10 indicate that the value for money provided by Option 1 ranges between medium and high value for money for the core scenario assessments, depending on the cost estimate level. The adjusted BCR indicates that with wider economic benefits included Option 1 will provide a high level of value for money. However, the sensitivity tests show that with only 50% of current Cardiff barrage users extending their journey to include the PHL, the value for money ranges between low and high. Option 1 appraisal tables are provided in Appendix 21 of the IAR.

3.3.2 Option 2 - Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

The economic impact of the proposed Bus Park and Ride in Cosmeston is presented in this section.

Existing Transport Demand

No existing transport demand has been calculated for Cosmeston Bus Park and Ride, as the facility does not exist at present.

Forecast Transport Demand

Forecast transport demand for the Bus Park and Ride in Cosmeston has been estimated by applying a 2% intercept rate to the A4055 adjacent to the Park and Ride site access route. This is based on the Nexus Park and Ride Strategy which found that intercept rates at most major Park and Ride sites are around 2%.

An additional adjustment factor has been applied to the intercepted rate to account for the additional distance required to travel off the A4055 to the Park and Ride site location. This is taken from the ARUP Sustainable Transport Impacts report (2018) which indicated that the additional drive time to access the site would impact upon passenger demand at a coefficient factor of 0.42.

In addition to the demand intercepted from private cars on the A4055, it is estimated that an additional 20% of passengers will be abstracted from other public transport services, based on the smarter Cambridge Transport Study 2016[25].

The forecast transport demand calculation the Park and Ride service is presented below:

- DfT AADT Count flow on the A4055 (CNO10630): 8700;
- Interception Rate: 2%;
- Adjustment Coefficient: 0.42;

[25] https://www.smartertransport.uk/

- Resulting passenger demand: 73;
- 20% Abstraction from other services: 15; and
- Total passenger demand: 88.

Park and Ride Service Operation

Discussions were held with stakeholders to identify possible route and service options for the Cosmeston to Cardiff Park and Ride service. The most effective service was decided to be an extension of the Cardiff Baycar Service that would be extended over Cardiff Barrage and through Penarth and into the Cosmeston Park and Ride site. It was advised that the service would require four buses to run three services per hour for 12 hours a day between 7AM and 7PM. The service would be provided 6 days a week. It should be noted that although the economic assessment is based on three services per hour, the feasibility of this frequency due to the operational nature of Cardiff Barrage would need further investigation.

Transport Benefits

The benefits derived from the implementation of a Bus Park and Ride site and service at Cosmeston are presented below.

Marginal External Benefits

Marginal external benefits have been calculated for the trips which have been taken off the highway network as a result of the implementation of Cosmeston Park and Ride and include congestion relief, accident reduction and greenhouse gas reduction. Marginal cost savings have been calculated by applying the WebTAG derived values presented in Table 3.5 to the forecast total journey distance removed from the highway. This has been calculated by multiplying the number of trips forecast by the distance from the A4055/Sully Moors Road Roundabout to Cardiff, with the distance from the roundabout to the P&R site subtracted. The total travel distance to be removed calculation is presented below:

- Total number of trips intercepted from A4055/Sully Moors Road junction: 73;
- Return journey distance from A4055/Sully Moors Road junction to Cardiff: 13.4 miles / 21.5 km;
- Return journey distance from A4055/Sully Moors Road junction to Park and Ride site: 5.6 miles / 9 km;
- Total car journey distance taken off the road per trip: 7.8 miles / 12.5 km; and
- Total car journey distance taken off the road per day: 570 miles / 917 km.

The 60-year marginal external cost saving NPV amount to **£871,538 (2010 prices)**.

Fuel Cost Savings

Fuel cost savings experienced by passengers have been calculated by multiplying the WebTAG derived fuel consumption values with the forecast total journey distance removed as calculated above. The resulting fuel cost savings gained over the 60-year appraisal period amount to a NPV of **£4,481,844 (2010 prices).**

Non-Fuel Operating Cost Savings

Non-fuel vehicle operating cost savings such as oil, tyres and maintenance have been calculated by multiplying the WebTAG derived values with the forecast total journey distance removed (as calculated above). The resulting 60-year non-fuel VOC NPV is **£1,359,242 (2010 prices)**.

Parking Charge Savings

Parking charge savings experienced by passengers using the Park and Ride service has been identified as a benefit and has been estimated by multiplying the total passenger demand by a city centre parking charge value. Cardiff City Centre parking charge were reviewed and an average parking charge of £4.78 has been used within the calculation. It has also been estimated that 25% of the users transferring from the car to the bus will not have paid for parking previously.

An annual inflation of 2.17% derived from the WebTAG databook has been applied to parking charges and the 60-year value has then been discounted to 2010 values. The resulting 60-year NPV benefit calculates to **£2,486,764 (2010 prices).**

Park and Ride Revenue

Park and Ride revenue has been calculated by multiplying the forecast demand with the ticket price for the Penarth to Cardiff day rider which is currently £3.80. An annual fare increase of 2% has been applied to the revenue calculation in accordance with the 5th TAS National Bus Fare Survey 2017. The revenue from abstracted demand has not been included. The 60-year revenue has been discounted to 2010 values in accordance with WebTAG. The total benefit in terms of revenue over the 60-year appraisal period, discounted to 2010 values is: **£1,968,199**.

Journey Time Benefits

The journey time for bus passengers is assumed to be the same as for car journeys and is therefore considered to be neutral cost.

Costs

The costs include capital investment costs, Park and Ride site maintenance costs and Park and Ride bus service operational costs.

Capital Investment Cost

A capital expenditure estimate has been produced for the construction of the Cosmeston Park and Ride site. This includes site clearance, site surface works and building structure works. A cost has also been included for the improvement of the Paget Street junction to accommodate bus movements. Further detail about the cost estimate is provided in Section 3.2 and Appendix 21 of the IAR. The total cost including a 44% optimism bias is **£6,399,969** in 2019 prices. This amounts to **£3,820,097** when discounted to 2010 prices.

A cost estimate for the bus route infrastructure improvements across the barrage has been taken from the 2015 Cardiff Bay Barrage Transport Link Feasibility Report by ARUP. It should be noted that no review or sense checking has been undertaken of the preliminary cost estimate as part of

this WelTAG Stage Two Report. This estimated a total cost of **£3,200,000** in 2015 prices, which equates to **£2,070,352** when discounted to 2010 prices.

Operational and Maintenance Costs

A general benchmark operational and maintenance cost of 20% of the intervention cost to occur every 20 years has been used within the economic analysis and is based on previous cost estimate work undertaken by Arup 2018. The operational and maintenance costs amount to **£2,559,987** in 2019 prices, which equates to **£596,603** when discounted to 2010 prices.

Park and Ride Service Costs

The Park and Ride Service costs have been calculated for the bus operating requirements specified above. The additional distance required to extend the Cardiff Baycar service has been used within the operating cost calculation as well as WebTAG values for fuel price, fuel consumption and other vehicle operating costs. The estimated daily bus operating costs amounts to **£751**.

This cost was compared to forecasts taken from Freightmetrics.com and the NEXUS/TAS Partnership – Network Costing 2011/2012 which indicated a daily cost of £805 and £1058 (2012 prices) respectively. This is considered to compare well with alternative cost estimate methods and has been used within the economic impact analysis.

An inflation rate of 2.17% was applied to the daily operating cost estimate in accordance with WebTAG. The resulting 60-year operational cost estimate discounted to 2010 price values amounted to **£30.1M**.

Bus Fare Costs

The bus fare has been included as a cost in addition to a revenue. The costs have been calculated in the same way as the revenue and amount to **£1,968,199**.

Value for Money Assessment

Application of the above cost and benefit values resulted in a BCR of **0.25 (poor)**. Option 2 appraisal tables are provided in Appendix 21 of the IAR.

3.3.3 Option 3 - Cogan Multi-Modal Sustainable Transport Interchange

The Option 3 proposal involves improvements to the Cogan Railway Station to create a multi-modal interchange facility and improve integration between rail and other transport modes. This includes the provision of an extended Park and Ride facility with approximately 150 parking spaces, on-station improvements including an Access for All bridge over the railway line and improvements to active travel links and facilities.

Existing Transport Demand

The existing demand for the car park is based on the total number of parking spaces currently provided (55), and the assumption that all spaces are fully occupied.

Existing passenger entry and exit movements at the station have been taken from the Office for Rail and Road (ORR) 2017 – 2018 Station Usage data. This indicated that Cogan railway station has an estimated annual usage of 310,002 entries and exits.

Forecast Transport Demand

The forecast demand at the Park and Ride Car park is based on the assumption that the additional car parking spaces will be 90% occupied during the week and 70% occupied during the weekend.

The annual transport demand is based on the annualisation values in the DfT Transport User Benefit Assessment (TUBA) programme which specifies 253 weekdays and 52 weekends per year.

The additional trips (entry and exits movements) forecast at the Cogan Railway Station, based on the parameters specified above, calculates to 46,721 per year.

A nominal increase of 1% has been applied to entries and exits via sustainable transport modes as a result of the improvements to active travel links and facilities. This results in an additional 8 trips per day (entries and exits) at Cogan railway station.

Benefits

The benefits derived from the implementation of Option 3 are presented below.

Marginal External Benefits

Marginal external benefits have been calculated for the trips which have been taken off the highway network as a result of the implementation of Cogan Multi-Modal Transport Interchange. Marginal cost savings have been calculated by applying the WebTAG derived values presented in Table 3.5 to the forecast total journey distance removed from the highway. This has been calculated by multiplying the number of trips forecast above by the trip distance – taken to be the distance between the Cogan Railway Station and Cardiff City Centre (4 miles / 6.2 Km). This results in an annual trip distance of 307353 Km taken off the highway and an annual benefit of £25,104. The 60-year NPV calculates to **£1,506,262** in 2010 prices.

It should be noted that the new car-based trips arriving at Cogan Railway Station may not all be new users at the station, as they may be trips that have transferred from other modes such as cycling or walking. They could also be trips that have abstracted from other nearby railway stations. As such, it is recommended that a survey is undertaken as part of future scheme development to understand how people currently travel to the station and how they would like to travel to the station.

Fuel Cost Savings

Fuel cost savings experienced by passengers using the train have been calculated by multiplying the WebTAG derived fuel consumption values with the forecast total journey distance removed as calculated above. This results in a 60-year fuel cost saving NPV of **£4,536,204** in 2010 prices.

Non-Fuel Operating Cost Savings

Non-fuel vehicle operating cost (VOC) savings such as oil, tyres and maintenance have been calculated by multiplying the WebTAG derived values with the forecast total journey distance removed (as calculated above). The resulting 60-year non-fuel VOC saving NPV equates to **£1,444,997**.

Parking Charge Savings

Parking charge savings experienced by passengers using the train from Cogan Railway Station has been estimated by multiplying the total passenger demand by a city centre parking charge value. Cardiff City Centre parking charge were reviewed and an average parking charge of £4.78 has been used within the calculation. It has also been estimated that 25% of the users transferring from the car to the train do not currently pay for parking.

An annual inflation of 2.17% derived from the WebTAG databook has been applied to parking charges and the 60-year value has then been discounted to 2010 values. The resulting 60-year NPV is **£4,726,988**.

Park and Ride Revenue

Train ticket revenue has been calculated by multiplying the forecast demand with the ticket price for a return journey between Cogan Railway Station and Cardiff Central. A weekly ticket price of £13.70 has been used to attain an average daily ticket price of £2.74. An annual fare increase of 3% has been applied to the revenue calculation in accordance with ORR Rail Fares Index for January 2017 – 2018. The 60-year revenue has been discounted to 2010 values in accordance with WebTAG. The total benefit in terms of revenue over the 60-year appraisal period, discounted to 2010 values is: **£4,592,752**.

Journey Time Benefits

The difference in journey time for journeys to Cardiff by train and by car is considered to be negligible. Therefore, no journey time benefit has been calculated.

Physical Benefits

Physical benefits experienced by railway passengers travelling to the station by sustainable transport mode have been attributed to the forecast additional volume of pedestrian and cycling trips identified above. Each walking and cycling trip is assumed to be 500 metres in distance which is approximately half the distance to the next available station. A split of 60% bicycle and 40% walking trips has been applied.

The physical benefit has then been calculated using the WHO HEAT programme. The resulting 60-year NPV of the physical benefits experienced amounts to **£96,120** in 2010 prices.

Costs

A cost estimate has been produced for the extended park and ride facility, the on-station improvements and the improvements to active travel links and facilities. The cost estimate for the Option 3 proposal amounts to £6,482,843 in 2018 prices and includes a 44% optimism bias. This calculates to PVC of **£3,803,011** in 2010 prices.

A general benchmark operational and maintenance cost of 20% of the intervention cost to occur every 20 years has been used within the economic analysis. The operational and maintenance costs amount to **£2,593,137** in 2019 prices, which equates to **£584,871** when discounted to 2010 prices.

Ticket prices have been estimated based on a weekly ticket price as described above. The PVC associated with the ticket prices amounts to **£4,592,752.**

Value for Money Assessment

Application of the above cost and benefit values resulted in a BCR of **3.06 (high)**. Option 3 appraisal tables are provided in Appendix 21 of the IAR.

3.3.4 Economic Impact Appraisal Summary and Conclusion

A summary of the economic impact assessment undertaken for each option is presented in Table 3.11.

Table 3.11 – Economic Impact Assessment Summary (60-year appraisal values at 2010 prices)

Option	Economic Benefits	Economic Costs	Net Present Value (NPV)	BCR
Option 1A Penarth Active Travel Network (does not include the PHL)	• Journey Quality (walk): £205K • Physical Benefits: £1.37M • Marginal External Cost Savings: £520K • Total: £2.1M	• INM Route Improvements: £317K • Cycle Hire Scheme: £176K (Cost met by S106 contributions) • Total: £317K (-£176K)	£1.78M	6.61
Option 1 Active Travel proposals for the Penarth to Cardiff Barrage Corridor (includes the PHL)	• Option 1 Total Benefits: £2.1M • Journey Quality (Cycle): £672K • Physical Benefits: £14.73M • Marginal External Benefits: £1.0M • Total: £18.06M	• Option 1 Total Cost: £493K		
Core Scenario + Low Cost Estimate		• PHL Capital Investment Cost: £5.98M • Operational & Maintenance Costs: £0.9M • Total: £7.16M	£10.83M (£7.50M)	2.50 (2.04)
Core Scenario + High Cost Estimate		• PHL Capital Investment Cost: £9.93M • Operational & Maintenance Costs: £1.53M • Total: £11.72M	£6.28M (£2.94M)	1.53 (1.25)
Adjusted BCR Scenario + Low Cost Estimate	• Wider Economic Benefit: £9.82M • Total: £27.88M	Low Cost Estimate: • Total: £7.16M	£20.65M (£15.38M)	3.86 (3.13)
Adjusted BCR Scenario + High Cost Estimate	• Wider Economic Benefit: £9.82M • Total: £27.88M	High Cost Estimate: • Total: £11.72M	£16.09M (£10.83M)	2.37 (1.92)
Option 2 Cosmeston Bus Park and Ride & Bus Priority Link across Cardiff Barrage	• Marginal External Cost Savings: £872K • Fuel Cost Savings: £4.48M • Non-Fuel operating Cost Savings: £1.36M • Parking Charge Savings: £2.49M • Park and Ride Revenue: £1.97M	• Capital Investment Cost: £5.89M • Operational and Maintenance Costs: £596K • Park and Ride Service Costs: £30.1M • Total: £36.88M	£-27.35M	0.25

Option	Economic Benefits	Economic Costs	Net Present Value (NPV)	BCR
	• Bus Fare Costs: £-1.97M • Total: £9.20M			
Option 3 Cogan Multi-Modal Sustainable Transport Interchange	• Marginal External Cost Savings: £1.50M • Fuel Cost Savings: £4.54M • Non-Fuel operating Cost Savings: £1.44M • Parking Charge Savings: £4.73M • Park and Ride Revenue: £4.59M • Physical Benefits: £96K • Train Fare Costs: £-4.59M • Total: £13.42M	• Capital Investment Cost: £3.80M • Operational and Maintenance Costs: £584K • Total: £4.38M	£9.03M	3.06

*Values in brackets refer to the 50% Transport Demand Sensitivity Test applied to Option 1.

The economic impact summary table above shows that Options 1 and 3 are forecast to provide value for money ranging from low to very high, and Option 2 provides poor value for money.

The best performing option scenario in terms of value for money is Option 1A (Active Travel Improvements without PHL). This is mainly due to the low cost associated with the option and the relatively large physical benefits generated by the increase in sustainable transport. The value for money provided by Option 1 (including PHL) varies between low and high value for money. The level of value for money is affected greatly by the cost associated with PHL and potential wider impacts such as tourism benefits.

Option 2 provides poor value for money. This is due to the large costs associated with subsidised bus services, and the relatively low transport demand and associated benefits anticipated.

Option 3 provides a high level of value for money. This is mainly due to the significant vehicle operating cost and parking charge savings gained by users transferring from the car to the train. The value for money assessment is also aided by a relatively low capital cost.

3.4 Non - Monetarised Benefits – Assessment of Impacts

The WelTAG Stage One Transport Case assessment involved undertaking a qualitative appraisal of each option against Economic, Environmental, Social and Cultural criteria. This appraisal has been reviewed and updated for WelTAG Stage Two, to reflect the additional option development work, the environmental and ecological reviews and economic assessment that has been undertaken. The appraisal has involved each option being assessed using the WelTAG seven-

point assessment scale, as set out in Section 1.4. The appraisal also considered when and where impacts will occur and who and/or what will experience the impacts. A summary of the results of this appraisal are presented in Tables 3.12 and is also included within Appendix 18 (Worksheet 10) of the IAR. Further justification and detail to support each of the appraisal scores is provided in Appendix 22 of the IAR.

Overall, Option 1 (Active Travel) scored most positively of the three options against the economic, environmental, social and cultural criteria. Of all the criteria in the assessment, Option 1 scored most highly in relation to its potential positive impact on physical activity and severance. Option 3 (Cogan Interchange) also scored positively overall, with no negative ratings against any of the economic, environmental, social or cultural criteria. Option 2 (Cosmeston Bus Park and Ride) scored positively against a number of social and cultural criteria, but was rated negatively against some environmental criteria e.g. landscape, cultural heritage and biodiversity. This is due to the potential impact of the proposal on Cosmeston Lakes Country Park and Cardiff Barrage. Option 2 also scored negatively in relation to accidents, due to the proposal to introduce buses on the currently traffic-free route along Cardiff Barrage, and in relation to affordability, due to the results of the economic assessment and the ongoing revenue costs linked to the proposal.

Table 3.12 – Appraisal Summary Table

Criteria	Qualitative Assessment			
	Option 1 – Active Travel Proposals for the Penarth to Cardiff Barrage Corridor	Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	Option 4 – Do Minimum
Economic				
Business Users & Reliability Impact	0	0	0	-
Regeneration	++	0	++	--
Wider Impacts	++	0	+	-
Environmental				
Noise	+	0	0	-
Air Quality	++	0	0	-
Greenhouse Gases	++	+	0	-
Landscape	0	--	+	-
Townscape	+	0	+	-
Historic Landscape	0	0	0	0
Cultural Heritage	+	-	0	0
Biodiversity	0	-	0	-
Social and Cultural				
Commuting and Other Users	++	++	++	--
Reliability Impact on Commuting and Other Users	+	+	++	--
Physical Activity	+++	0	+	-
Journey Quality	++	+	++	-
Accidents	+	-	0	-
Security	+	+	+	0
Access to Services	++	++	++	--
Welsh Language	0	0	0	0
Tourism	++	0	0	-
Affordability	+	--	+	0
Severance	+++	0	+	-
Option Values	+	+	+	0

Criteria	Qualitative Assessment			
	Option 1 – Active Travel Proposals for the Penarth to Cardiff Barrage Corridor	Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	Option 4 – Do Minimum
Public Accounts				
Cost to Broad Transport Budget	£12.8M - £20.8M (2019 Prices)	£48.5M (2019 Prices)	£7.8M (2019 prices)	NYA
Indirect Tax Revenues	NYA	NYA	NYA	NYA
Occurrence of Impacts				
When and where impacts will occur (positive and negative)	During the construction and operational stages, in the vicinity of the Active Travel network. Positive impacts to the wider area if car trips are removed from the highway network.	During the construction and operational stages, in the vicinity of the proposed scheme. Positive impacts to local roads and junctions if car trips are removed from the highway network. Potential negative impacts to existing users (pedestrians and cyclists) of Cardiff Barrage and to Cosmeston Lakes Country Park.	During the construction and operational stages, in the vicinity of Cogan Station. Potential impacts (both positive and negative) to the local highway network e.g. scheme has the potential to remove car trips from the highway network, but concerns expressed through the Stage Two consultation that the scheme may increase traffic on local roads and junctions in the vicinity of Cogan Station.	Negative impacts across the Penarth to Cardiff Barrage Corridor study area including local roads and junctions, Penarth town centre etc.
Who or what will experience the impacts	Users of the active travel network. Users of the local highway network. Residents, commuters, businesses and visitors to the area.	Users of the proposed bus park and ride service. Users of the local highway network. Users of Cardiff Barrage. Visitors to Cosmeston Lakes Country Park. Residents, commuters, businesses and visitors to the area.	Users of the rail service and proposed park and ride. Users of the local highway network. Residents, commuters, businesses and visitors to the area.	Users of the local highway network. Residents, commuters, businesses and visitors to the area.

3.5 Summary of Transport Case and Value for Money Statement

The Transport Case has considered the social, cultural, environmental and economic impacts of each of the shortlisted options. This has included a quantitative economic assessment of the costs and benefits of each option and a qualitative appraisal that has considered wider social, cultural and environmental impacts. A summary of the value for money assessment is included as Table 3.13.

The Transport Case economic assessment of Option 1 (Active Travel) produced a BCR range of 1.25 to 3.86, which represents BCR values ranging from low to high value for money. The BCR of Option 1 is affected greatly by the cost associated with the PHL proposal and potential wider impacts such as tourism benefits. The BCR range reflects the PHL scenarios considered by the economic assessment of Option 1 i.e. scenarios that take account of the lower and higher cost estimates currently available for the PHL, the inclusion of wider economic benefits in an adjusted BCR and a sensitivity test to take account of a potentially lower usage of the PHL. Further development of the PHL proposal would enable the BCR of Option 1 to be refined.

Due to the difference in the scale and nature of the PHL in comparison to the other Active Travel proposals within Option 1, the economic assessment also considered a variation (Option 1A) that includes all Active Travel proposals within Option 1 other than the PHL. In terms of the economic assessment, Option 1A was the best performing option with a BCR of 6.61, which represents very high value for money. This very high value for money is achieved due to the relatively low level of cost of Option 1A, including developer funding contributions, and the high level of physical benefits associated with increased cycling and walking.

It should be noted that the majority of economic benefits of Option 1 are derived from the physical benefits experienced by leisure and recreational users of the Active Travel network e.g. an assessment of the value of reduced mortality that results from increased walking and cycling. For example, the overall economic benefits of Option 1 (core scenario) included within the economic assessment total £18.06M, of which £16.10M are physical benefits to health. Therefore, the value of transport-related benefits within the economic assessment of Option 1 (e.g. savings gained as a result of car trips removed from the highway network) are relatively limited, which is due to the relatively small-scale impact of Option 1 on transport demand.

The Transport Case economic assessment of Option 2 (Cosmeston Bus Park and Ride) produced a BCR of 0.25, which represents poor value for money. This is due to the significant funding required to subsidise the park and ride bus service, the limited transport demand that it would serve and the low level of benefits produced.

The Transport Case economic assessment of Option 3 (Cogan Interchange) produced a BCR of 3.06, which represents high value for money. This is mainly due to the significant vehicle operating cost and parking charge savings gained by users transferring from the car to train. The value for money assessment is also aided by a relatively low capital cost.

It should be noted that all cost estimates on which the economic assessment is based are preliminary in nature, which reflects the current stage of development of each of the options. Any changes to cost estimates should options be further developed will impact on the economic assessment, which will need to be revisited and refined to reflect any further development work.

In relation to the qualitative Transport Case appraisal, Option 1 (Active Travel) scored most positively overall against the economic, environmental, social and cultural criteria. Option 3 (Cogan Interchange) also scored positively overall, with no negative ratings against any of the economic, environmental, social or cultural criteria. Option 2 (Cosmeston Bus Park and Ride) scored positively against a number of social and cultural criteria, but was rated negatively against some environmental criteria e.g. landscape, cultural heritage and biodiversity. This is due to the potential impact of the proposal on Cosmeston Lakes Country Park and Cardiff Barrage. Option 2 also scored negatively in relation to accidents, due to the proposal to introduce buses on the currently traffic-free route along Cardiff Barrage, and in relation to affordability, due to the results of the economic assessment and the ongoing revenue costs linked to the proposal.

Table 3.13 – Value for Money Assessment Summary

Option	Summary of benefits and costs assessed	Present value of benefits and costs	Initial BCR	Adjusted BCR	Qualitative assessment	Key risks and uncertainties	VfM category and reasons
Option 1 – Active Travel Proposals for the Penarth to Cardiff Barrage Corridor	Transport benefits – journey quality, physical benefits, marginal external benefits. Wider economic benefits relating to leisure and tourism included in adjusted BCR. Costs – capital investment costs, operational and maintenance costs	Present Value Benefits (PVB) – sensitivity test values shown in brackets Core scenario £18,063,023 (£14,729,383) Adjusted scenario £27,879,780 (£22,610,442) Present Value Costs (PVC) Low Cost Scenario £7,229,573 High Cost Scenario £11,785,322	1.53 – 2.50 (1.25 – 2.04) BCR range reflects low and high PHL cost estimates. Sensitivity test values shown in brackets.	2.37 – 3.86 (1.92 – 3.13) BCR range reflects low and high PHL cost estimates. Sensitivity test values shown in brackets.	Overall impact – Moderate positive Strong positive impacts recorded – physical activity, severance. Moderate positive impacts recorded – regeneration, wider impacts, air quality, greenhouse gases, commuting and other users, journey quality, access to services, tourism. Detail of assessment included in Appendix 22 of the IAR.	Risks and uncertainties relating to cost estimates detailed in Table 3.1. Demand forecasts for the PHL based on existing survey information with low sample survey results. A sensitivity test BCR has been produced which takes account of a potentially lower usage of the PHL.	**Low to High** VfM category based on the results of the economic assessment. VfM category of Option 1 is greatly affected by the cost of the PHL proposal and potential wider impacts such as tourism benefits. VfM category range reflects the PHL scenarios considered by the economic assessment.

Option	Summary of benefits and costs assessed	Present value of benefits and costs	Initial BCR	Adjusted BCR	Qualitative assessment	Key risks and uncertainties	VfM category and reasons
Option 1A – Penarth Active Travel Network – proposals within Option 1 other than PHL (sub-option included in economic assessment)	Transport benefits – journey quality, physical benefits, marginal external cost savings. Costs – capital investment costs, operational and maintenance costs.	Present Value Benefits (PVB) £2,093,179 Present Value Costs (PVC) £317,144	6.61	N/A	Refer to qualitative assessment of Option 1 – sub-option not included separately in qualitative assessment.	Risks and uncertainties relating to cost estimates detailed in Table 3.1.	**Very High** VfM category based on the economic assessment and supported by the qualitative assessment. Very high value for money due to the relatively low cost of Option 1A, including developer funding contributions, and the high level of physical activity benefits associated with increased cycling and walking.
Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Transport benefits – marginal external benefits, fuel cost savings, non-fuel operating cost savings, parking charge savings, park and ride revenue, journey time benefits Costs – capital investment costs, operational and maintenance costs, park and ride service costs, bus fare costs	Present Value Benefits (PVB) £9,199,387 Present Value Costs (PVC) £36,550,256	0.25	N/A	Overall impact – Neutral Moderate positive impacts recorded – commuting and other users, access to services. Moderate negative impacts recorded – landscape, affordability. Detail of assessment included in Appendix 22 of the IAR.	Risks and uncertainties relating to cost estimates detailed in Table 3.1.	**Poor** VfM category based on the economic assessment and supported by the qualitative assessment. Poor value for money due to significant funding required to subsidise the park and ride bus service, limited transport demand that it would serve and low level of benefits produced.

Option	Summary of benefits and costs assessed	Present value of benefits and costs	Initial BCR	Adjusted BCR	Qualitative assessment	Key risks and uncertainties	VfM category and reasons
Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	Transport benefits – marginal external benefits, fuel cost savings, non-fuel operating cost savings, parking charge savings, park and ride revenue, journey time benefits, physical benefits. Costs – capital investment costs, operational and maintenance costs, train fare costs.	Present Value Benefits (PVB) £13,418,430 Present Value Costs (PVC) £4,387,882	3.06	N/A	Overall impact – Slight positive Moderate positive impacts recorded – regeneration, commuting and other users, reliability impact on commuting and other users, journey quality, access to services. Detail of assessment included in Appendix 22 of the IAR.	Risks and uncertainties relating to cost estimates detailed in Table 3.1.	**High** VfM category based on the economic assessment and supported by the qualitative assessment. High value for money due to the significant vehicle operating cost and parking charge savings gained by users transferring from the car to train. Also aided by a relatively low capital cost.

4. Financial Case

4.1 Overview

As detailed in WelTAG 2017, 'the Financial Case tells you whether an option is affordable in the first place and the long-term financial viability of a scheme. It covers both capital and revenue requirements over the life time of the project and the implications of these for the balance sheet, income and expenditure accounts for public sector organisations.'

The following considerations should be made in outline at Stage One and completed by Stage Two:

- Lifetime costs of the project;
- Sources of funding; and
- Accounting implications.

At WelTAG Stage One, a qualitative assessment of the Financial Case was undertaken, due to the early stage of development of each of the options under consideration. The Financial Case has been developed in greater detail as part of the WelTAG Stage Two process, which reflects the option development work that has been undertaken and the preliminary cost estimates that are available for each of the options.

4.2 Capital and Ongoing Costs and Potential Funding Sources

Details of the capital cost of each option are included in Section 3.2 of the Transport Case, which includes details about the source of all cost estimates and assumptions made in the development of the costs. The economic assessment that has been undertaken as part of WelTAG Stage Two has involved a consideration of the potential ongoing revenue costs of each option. In all cases, further development and design work is needed to establish more robust cost estimates. The preliminary cost estimates, both capital and revenue, will be further developed and refined as any recommended options are progressed in greater detail during WelTAG Stage Three. This will enable the financial case to be further developed.

The Financial Case assessment is presented in Table 4.1 and considers factors affecting the lifetime costs of each option, potential sources of funding and accounting implications to public sector organisations. The assessment considers both the capital and revenue implications of each option. At this stage costs relating to monitoring and evaluation have not been included within the cost estimates and will be considered for any options taken forward to WelTAG Stage Three.

Table 4.1 – Financial Case Assessment

Financial Case				
Option (Capital/ Revenue)		***Lifetime Costs of the Project***	***Potential Sources of Funding***	***Accounting Implications***
Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor	Capital	***Preliminary capital cost estimate of Option 1:*** • Penarth Active Travel Network (without PHL) - £0.55M; • PHL - £10M - £16.6M; and • Penarth Cycle Hire Scheme – £0.3M. ***Factors affecting lifetime capital cost of the project:*** • Capital cost at the start of the project relating to the delivery of new active travel infrastructure; • Option 1 contains a number of Active Travel routes that vary in delivery cost on a scheme by scheme basis; • Other than the PHL, the majority of routes within Option 1 are relatively low-cost schemes based on the current proposals that do not require land acquisition; and • The PHL is a complex engineering scheme that requires a high level of capital investment.	• Local Transport Fund, Active Travel Fund and Safe Routes in Communities funding from Welsh Government. (In May 2018 the Welsh Government committed £60 million funding for Active Travel over the next three years.); • Wider benefits of PHL could attract funding from other sources e.g. tourism funding; • £300K Section 106 funding allocated towards the proposed cycle hire scheme; • Potential for land to be opened up for development and that funding used to assist; and • Potential for private sector investment in the provision of active travel facilities at employment sites e.g. bike storage, showers etc.	• Local authority in relation to any grant funding/S106 contributions for the delivery of active travel schemes.

Financial Case				
Option (Capital/ Revenue)		***Lifetime Costs of the Project***	***Potential Sources of Funding***	***Accounting Implications***
	Revenue	***Preliminary estimate of ongoing revenue costs:*** • Penarth Active Travel Network (without PHL) – Not estimated at this stage but expected to be minimal and incorporated within Local Authority budget; • PHL – Estimated at 20% of scheme cost to occur every 20 years. This calculates to £4M – £6.6M (depending on scheme cost estimate used) over the 60 year appraisal period; and • Penarth cycle hire scheme costs expected to be met by provider. ***Factors affecting lifetime revenue cost of the project:*** • Ongoing revenue costs to maintain any new active travel routes and associated infrastructure e.g. signing, lighting, bike storage/ parking; • Ongoing revenue costs associated with the PHL proposal (e.g. potential maintenance and operational costs) are likely to be greater than other Active Travel schemes and will need to be considered in the further development of the scheme; and • The design of new infrastructure should seek to minimise ongoing maintenance requirements, which will need to be considered on a scheme by scheme basis.	• Local authority budgets for highway maintenance; • Responsibilities for maintenance of the PHL and associated funding would need to be determined as part of the development of the scheme; and • Potential for private sector investment to support the expansion of a bike hire scheme.	• Local authority in relation to the maintenance of active travel infrastructure; and • Organisation responsible for the maintenance of the PHL would need to be determined as part of the scheme development process.

Financial Case				
Option (Capital/ Revenue)		***Lifetime Costs of the Project***	***Potential Sources of Funding***	***Accounting Implications***
Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Capital	***Preliminary capital cost estimate of Option 2:*** • Cosmeston Park and Ride and bus route to Cardiff Barrage - £6.4M; and • Bus route over Cardiff Barrage - £3.2M. ***Factors affecting lifetime capital cost of the project:*** • Capital cost at the start of the project relating to the delivery of any new highway/ park and ride infrastructure. • Scale of the works proposed will impact on the capital cost e.g. current park and ride proposal is for 150 park and ride spaces, currently no bus priority works proposed along the route to Cardiff Barrage. • Route option for the bus route across Cardiff Barrage will impact on the capital cost of the proposal – cost estimate currently includes highest cost route option on Welsh Government land. • Potential capital cost at the start of the project relating to the purchase of vehicles to support the bus park and ride (if existing fleet not used).	• Local Transport Fund and Local Transport Network Fund from Welsh Government; • City Deal; and • Developer funding.	• Local authority in relation to grant funding.

Financial Case				
Option (Capital/ Revenue)		***Lifetime Costs of the Project***	***Potential Sources of Funding***	***Accounting Implications***
	Revenue	***Preliminary estimate of ongoing revenue costs:*** • Cosmeston Park and Ride and bus route to Cardiff Barrage – Estimated at 20% of total infrastructure costs to occur every 20 years. This calculates to £2.5M over the 60-year appraisal period; • Operational cost of park and ride bus service estimated to be £35M over 60 year appraisal period; and • Bus route over Cardiff Barrage – Estimated at 20% of scheme cost to occur every 20 years. This calculates to £1.2M over the 60-year appraisal period. ***Factors affecting lifetime revenue cost of the project:*** • Ongoing revenue costs to maintain any new highway and associated infrastructure e.g. park and ride car park, CCTV at the park and ride, bus route over Cardiff Barrage; • It is likely that the park and ride bus service will operate as a supported service, which will have ongoing revenue implications; and • Option 2 has the highest ongoing revenue costs of all three options due to the operating cost of the bus service.	• Local authority budgets for highway/ CCTV maintenance; and • The 2015 Arup report details that the Welsh Government provides funding to operate and maintain Cardiff Barrage.	• Local authority in relation to the maintenance of highway/ CCTV infrastructure. • Cardiff Barrage is under the control/ ownership of Cardiff Council (via the Cardiff Harbour Authority).

Financial Case				
Option (Capital/ Revenue)		***Lifetime Costs of the Project***	***Potential Sources of Funding***	***Accounting Implications***
Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	Capital	***Preliminary capital cost estimate of Option 3*** • Cogan Multi-Modal Sustainable Transport Interchange - £6.49m ***Factors affecting lifetime capital cost of the project:*** • Significant capital cost at the start of the project relating to the delivery of new transport infrastructure; and • Scale of works proposed will impact on capital cost and changes to the scope of the proposal will impact on cost estimate e.g. additional proposals for highway improvements could be high cost.	• Welsh Government/ City Deal/ Metro.	• Transport for Wales is the lead delivery body for rail schemes/ works on operational rail land; • Land required for the Park and Ride in Welsh Government ownership; and • Local authority likely to be the lead delivery body for works to the local highway network.
	Revenue	***Preliminary estimate of ongoing revenue costs:*** • Cogan Multi-Modal Sustainable Transport Interchange – Estimated at 20% of scheme costs to occur every 20 years. This calculates to £2.6M over the 60-year appraisal period. ***Factors affecting lifetime revenue cost of the project:*** • Ongoing revenue costs to maintain any new rail/ highway/ Active Travel and associated infrastructure e.g. CCTV at the park and ride; and • Responsibilities for maintenance of the proposed infrastructure would need agreement as part of development of the proposal.	• Transport for Wales budgets for maintenance of rail infrastructure; and • Local authority budgets for highway maintenance.	• Transport for Wales in relation to the maintenance of rail infrastructure; and • Local authority in relation to the maintenance of highway infrastructure.

Financial Case				
Option (Capital/ Revenue)		***Lifetime Costs of the Project***	***Potential Sources of Funding***	***Accounting Implications***
Option 4: Do Minimum	Capital	• No capital cost implications as the do minimum option assumes no investment in new transport infrastructure.	• N/A	• N/A
	Revenue	• Ongoing revenue requirements to maintain existing highway infrastructure and to subsidise existing supported bus services.	• Local authority budgets for highway maintenance. • Local authority budgets and Welsh Government's Bus Services Support Grant (BSSG) to subsidise bus services.	• Local authority

4.3 Summary of Financial Case

The Financial Case has identified the capital costs and ongoing revenue costs anticipated for each option assessed. The Financial Case has considered factors affecting the lifetime costs of each option, potential sources of funding and accounting implications to public sector organisations.

The options assessed vary in the scale of the capital investment required at the start of the project but also in the ongoing costs of each option. Option 1 has largest capital cost requirement overall with cost estimates ranging between £10.9M and £17.5m. This is due to the large-scale PHL proposal forming part of Option 1. The other Active Travel proposals within Option 1 are relatively low cost and form a small proportion (less than £1 million) of the overall capital cost of Option 1. Due to the high capital cost of Option 1, maintenance costs over the 60-year appraisal period are also identified to be large with costs ranging between £4M and £6.6M.

The capital cost of Option 2 is forecast to be significant at £9.6M although slightly lower than that for Option 1. However, the operational costs associated with Option 2 are the largest of any of the options at £35M and occur due to the need to subsidise the park and ride bus service.

The capital cost associated with Option 3 is estimated at £6.5M and operational and maintenance costs are estimated at £2.6M. These are the lowest overall cost requirements expected of any of the 3 options.

Due to the large capital cost requirements of all three options, it is expected that external grant funding will need to be secured to fund delivery of any of the options. It is similarly expected that Welsh Government funding will be required to support the ongoing operational and maintenance requirements of each option. There may be opportunities for developer funding to contribute to the delivery of the options e.g. some route proposals within Option 1 (Active Travel) have the potential to be wholly funded through developer contributions.

In all cases, further development and design work is needed to establish more robust cost estimates. The preliminary cost estimates, both capital and revenue, will be further developed and refined as any recommended options are progressed in greater detail during WelTAG Stage Three.

5. Commercial Case

5.1 Overview

As detailed in WelTAG 2017, 'the Commercial Case tells you if a scheme will be commercially viable, whether it is going to be possible to procure the scheme and then to continue it in to the future. It focuses in particular on the level and type of involvement of the private sector in each option. This includes items that affect the delivery of the option and its on-going viability, for example, will there be an on-going need for revenue support, will there be any charges levied on users or non-users and the allocation of risk for the provision of the project and during its on-going operation.' Such considerations will be made in outline at Stage One of the WelTAG process and completed by Stage Two.

The WelTAG Stage One Commercial Case included a high-level consideration of procurement issues and options, contract length and potential human resource issues. The Commercial Case has been further developed for WelTAG Stage Two and includes wider considerations such potential private sector involvement and ongoing viability of each option.

5.2 Procurement Options, Private Sector Involvement and On-going Viability

Each option under consideration (other than the do minimum) will require the procurement of capital works to deliver new infrastructure for the sustainable transport improvements. At this stage of option development, the procurement method and associated matters such as contract length, payment mechanism and pricing framework, have not been determined for the options. Further information will be contained in the Full Business Case (WelTAG Stage 3) for any options that are recommended to be progressed.

One issue affecting the procurement of the capital works is the lead delivery body for each option. Due to the nature of the options currently being considered at WelTAG Stage Two, there may be different bodies that would lead on delivery. For example, the delivery of the Vale of Glamorgan's Active Travel INM is likely to be led and procured by the Vale of Glamorgan Council, whereas the multi-modal sustainable transport interchange option is likely to be led and potentially procured by Transport for Wales. Any option that involves the use of Cardiff Barrage will require involvement by Cardiff Council, in addition to the Vale of Glamorgan Council, and could result in elements of the option involving Cardiff Barrage being procured by different bodies. The nature of the options under consideration and the responsibilities of different bodies, highlights the need for close collaboration in the development of the options and in determining the most appropriate procurement route.

Each recommended option will need to be procured in line with the lead body's financial regulations and standing orders for contracts to ensure best value. The method of procurement will also need to be in line with any grant funding requirements, depending on how the preferred option is financed.

Table 5.1 identifies factors that will affect the procurement of each of the options and highlights issues affecting the level of private sector involvement and on-going viability of each option.

Table 5.1 – Procurement considerations, private sector involvement and ongoing viability

Option	Procurement considerations	Private sector involvement and on-going viability
Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor	• Capital works of most Active Travel proposals likely to be procured by Vale of Glamorgan Council; • Active Travel links within Option 1 likely to be delivered on a phased basis – phasing of delivery will affect the contract value and length; and • PHL – procurement of capital works will need detailed consideration due to nature, location and scale of proposal.	• Private sector involvement in constructing the Active Travel network; • Option 1 is a capital infrastructure scheme – on-going public sector revenue support required to maintain the Active Travel network, no charging implications for users of the Active Travel network; • PHL – likely to require a higher level of revenue support than the other Active Travel proposals e.g. likely to have greater maintenance and operational requirements due to the location and nature of the proposal; and • Complementary Active Travel proposals may require ongoing involvement by the private sector and may involve a charge to users e.g. proposal for a bike hire scheme in Penarth.
Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	• Lead body for the procurement of the capital works would need consideration – Vale of Glamorgan Council has responsibility for Cosmeston Lakes Country Park and the local highway network, Cardiff Council has responsibility for Cardiff Barrage; • Consideration would be needed of whether the works should be procured as discreet elements due to the nature of the scheme. Such issues will affect contract value and length; • Cardiff Barrage – procurement of works will need detailed consideration due to nature and location proposal; and	• Private sector involvement in constructing the park and ride facility and the bus route to and over Cardiff Barrage; • Option 2 is a capital infrastructure scheme – on-going public sector revenue support required to maintain the new infrastructure; • Users will be charged to use the bus service from the park and ride facility; and • Ongoing involvement by the private sector to run the bus service to and from the park and ride facility – likely to require ongoing public sector revenue support.

Option	Procurement considerations	Private sector involvement and on-going viability
	• Procurement options for the park and ride bus service would need consideration – option is currently based on the extension of the Cardiff Bus Baycar service.	
Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	• Lead body for the procurement of the capital works would need consideration due to the involvement of different parties in Option 3 e.g. Transport for Wales would be the lead body for works affecting the rail network, the land required for the development of the proposal is in Welsh Government ownership, proposal will also include works to the local highway network which is the responsibility of the Vale of Glamorgan Council.	• Private sector involvement in constructing the multi-modal interchange; • Option is a capital infrastructure scheme – on-going revenue support required to maintain the new infrastructure, consideration and agreement would be needed of responsibilities for future maintenance due to the nature and location of the proposal; • Current proposal assumes an unmanned, on-platform ticket machine to limit ongoing revenue requirements; and • No charge to the user currently proposed for the park and ride facility, there will be a charge to users for use of the rail network.

5.3 Human Resources and TUPE Implications

It is unlikely that there will be any TUPE (Transfer of Undertakings [Protection of Employment] Regulations) issues relating to the implementation of any of the options. It is difficult to confirm whether there will be any HR (Human Resources) implications at this stage of option development.

The future development of any of the options will require consideration of whether the new facilities and services will have additional staffing requirements or will require existing staff to undertake additional duties. Examples of elements that could have additional staffing requirements include the operation of the bus service to the park and ride facility, operation of CCTV infrastructure at the bus park and ride site and multi-modal interchange or undertaking any operational requirements of the PHL. Consideration will also need to be given to the most appropriate employing organisation for any additional staffing requirements. If appropriate, further information will be contained in the Full Business Case (WelTAG Stage Three).

5.4 Summary of the Commercial Case

Each option under consideration (other than the do minimum) will require the procurement of capital works to deliver new infrastructure. At this stage of option development, the procurement method and associated matters such as contract length, payment mechanism and pricing framework, have not been determined for the options. The WelTAG Stage Two Commercial Case has highlighted a range of issues that will need consideration when determining the most appropriate method of procurement. Issues identified include determining the lead body in the procurement process and whether an option is delivered as a single contract or would need to be procured as discreet elements e.g. to reflect the phased delivery of Active Travel links.

Issues relating to the level of private sector involvement and on-going viability have also been identified for each option. As all options involve the construction of new infrastructure, the capital elements of each option have similarities in terms of the level of private sector involvement and a reliance on on-going revenue support to maintain the new infrastructure. Further information on all elements within the Commercial Case will be contained in the Full Business Case (WelTAG Stage Three).

6. Management Case

6.1 Overview

As detailed in WelTAG 2017, 'The Management Case tells you if an option is achievable. This case covers the delivery arrangements for the project and then its management during its life time. The management case should embed the five ways of working.'

The management case should consider aspects such as:

- Project planning;
- Legal requirements;
- Governance structure;
- Project reporting arrangements;
- Communications and stakeholder management;
- Risk management;
- Monitoring and evaluation; and
- Benefits realisation.

The WelTAG Stage One Management Case involved a high-level assessment of factors that may impact on the delivery of each option. The Management Case has been developed in greater detail for WelTAG Stage Two to reflect the option development work that has been undertaken.

6.2 Scheme Development, Legal Requirements and Delivery Arrangements

Each option being considered by this WelTAG Stage Two Report is at a preliminary stage of development. Section 2.6 details the variations in the development stage of each of the options with some elements benefiting from previous studies having been undertaken.

All of the options require further development work prior to being in a position to progress scheme delivery. This includes design work (e.g. review of any existing design work, outline design and detailed design) and undertaking any associated requirements to inform development of the proposals (e.g. environmental and ecological requirements, geotechnical requirements, survey work etc.). This further work will enable more robust cost estimates to be developed, which will enable a more detailed economic assessment to be undertaken.

Tables 6.1 to 6.3 provide an overview of the key development stages required for each option and the statutory procedures that may need to be undertaken. Due to the current stage of development of each of the options, the tables do not currently identify steps beyond the scheme development stage e.g. steps relating to procurement, construction, monitoring and ongoing operational issues. In addition, the tables do not include reference to aspects of scheme development that are applicable to all options e.g.:

- Project management processes that will need to accompany the development of any of the options e.g. development of a project plan and delivery programme. Project management is further considered in Section 6.4;
- Further stakeholder engagement and potentially further public consultation that will be required during the development of each of the options; and

- Business case development – Further work to develop the options and obtain more robust cost estimates will inform the business case for the proposals, which will be important for those options taken forward to WelTAG Stage Three. The ongoing development of the Five Cases (Strategic, Transport, Financial, Commercial and Management) will be an important aspect of scheme development for any of the options that are progressed. Development of a funding package for scheme delivery will be an important consideration in the development of the business case.

Tables 6.1 to 6.3 are based on the scheme elements within the current WelTAG Stage Two option descriptions and will need to be reviewed and updated as scheme development progresses. They reflect feedback from the stakeholder workshop and public consultation e.g. the development stages of the Active Travel network builds in consultation feedback that proposals should be more ambitious and include additional links.

Development work for each option will need to be in line with the five ways of working of the Well-being of Future Generations (Wales) Act 2015. This will ensure that, for example, options are developed collaboratively and with the involvement of interested parties and that long-term considerations are built into the development process e.g. ensuring management process are in place for the long-term maintenance of the infrastructure.

As detailed in Section 5.2 above, the lead body for development and delivery could vary depending on the preferred option that is taken forward. Section 5.2 considered how the lead body could impact on procurement arrangements. The lead body will also impact on how scheme development progresses, the working arrangements that will be required to undertake the required statutory procedures and scheme delivery. Similarly, the preferred option will impact upon roles and responsibilities for the ongoing management and operation of the option following its delivery. For example, the local authority would be responsible for the long-term management and operation of schemes on the local highway network whereas Transport for Wales would have responsibility for schemes on the rail network.

Issues such as these will be further considered in later stages of the WelTAG process as any recommended options are developed in greater detail. This will include consideration of the arrangements and responsibilities for monitoring and evaluating scheme impacts. A Benefits Realisation and Monitoring and Evaluation Plan will be produced at WelTAG Stage Three (Final Business Case), which will set out the arrangements for monitoring and evaluation following scheme delivery. This will ensure the long-term impacts of the preferred option are monitored and evaluated to ensure objectives are being achieved and benefits realised.

6.3 Project Risks and Deliverability

The WelTAG Stage One report included a high-level consideration of deliverability of each option as part of the appraisal process. This included an assessment of constraints and key risks that could affect delivery of each option e.g. in terms of feasibility, acceptability and timescales for delivery. The further work that has been undertaken for WelTAG Stage Two has enabled a more detailed assessment of risks and deliverability issues affecting each option, which are summarised in Tables 6.1 to 6.3. The full deliverability assessment is included in Appendix 18 of the IAR.

One deliverability issue highlighted is that Options 2 and 3 are reliant on third parties to enable delivery of key elements of the proposals, i.e. the Cardiff Barrage element of Option 2 is in the control of Cardiff Council and the ongoing development and delivery of Option 3 will be largely dependent upon Transport for Wales who have responsibility for improvements to the rail network. As such the prioritisation and programming of these options are not within the control of the local authority.

In addition to the specific risks associated with each option, there will also be more general risks that will need consideration and will be applicable to all options, such as the reliance on external funding to enable delivery and engineering project risks.

Due to the relatively early stage of development of each of the options, all potential risks to delivery cannot be identified and quantified at this stage of the WelTAG process. As the development of recommended options is progressed, a Risk Management Strategy and Risk Register for each option will be developed as part of the project management processes.

Table 6.1 – Scheme development considerations for Option 1

Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor	

Development Stages	**Penarth Active Travel Network** (PHL considered separately below):
	• **Additional evidence** – Additional survey work required to gain a better understanding of current and potential future usage of the network.
	• **Feasibility work** – Further development of proposed Active Travel network through an area-wide study to e.g. review existing proposals, develop more ambitious proposals, identify alternative links if feasible and appropriate, consider additional links e.g. to schools, consider phasing of delivery of the network, determine extent of a 20mph limit.
	• **Design work** – Outline and detailed design of network (in line with agreed phasing) – includes associated work such as topographical surveys and the development of cost estimates.
	• **Environmental and ecological work** – Additional work required to inform the statutory procedures required (refer to detail below) e.g. Preliminary Ecological Assessment to inform the requirement for targeted ecological surveys.
	• **Statutory procedures** (refer to detail below) – Liaison/ consultation with statutory bodies and service providers as necessary e.g. NRW.
	• **Land matters** – Current Active Travel proposals will not require land purchase.
	• **Additional stages** – May be required as the Active Travel network is further developed e.g. more ambitious proposals may have land requirements.
	
	PHL:
	• **Additional evidence**
	  • Additional survey work required to gain a better understanding of likely demand for the PHL;
	  • Further development of the wider economic assessment of the scheme e.g. in relation to leisure, tourism, user welfare benefits and wider development opportunities; and
	  • Additional evidence required to inform further maritime and geotechnical studies as detailed in a 2018 Arup report[26] e.g. acquisition of offshore wave data, numerical modelling to determine seastate conditions for detailed designs.
	• **Feasibility work** – The design and cost of the PHL proposal is based on an 'outline concept design' as detailed in Section 3.2 of this Report. This proposed design and cost estimate will require a detailed independent review to confirm the feasibility of the proposal and provide more surety to the cost range that has been developed to date. Feasibility work will need to have regard to the restrictions of the Cardiff Bay Barrage Act 1993 in developing the design of the PHL.
	• **Design work** – Outline and detailed design of the proposal – will need to be informed by geotechnical and environmental considerations and will include the development of a more robust cost estimate. Due to the location and nature of the scheme, the construction strategy will need to be considered throughout the development of the design.

[26] Vale of Glamorgan Council Penarth Headland Link – Stage 1 Maritime and Geotechnical Review, Arup, April 2018

	• **Geotechnical considerations** – A 2018 Arup report[27] undertook a review of maritime and geotechnical matters in relation to the PHL proposal and identified the further maritime and geotechnical works required to progress the development of the scheme. This includes e.g. an assessment of the impacts of the proposed scheme on coastal processes, Joint Probability Assessment of wave heights and water levels, further assessment of rock fall hazards etc. A copy of the further work identified by this study is included in Appendix 7 of the IAR. These will be key factors affecting the design of the scheme. In addition, consultation with Vale of Glamorgan Council officers[28] has highlighted the need to ensure any studies and modelling work incorporate the latest climate change/ sea level forecasts and that the potential coastal protection implications of a future drift reversal are considered when developing the proposal. • **Environmental and ecological work** – A 2019 RSK report[29] has reviewed the legislation to be considered in relation to environmental planning matters. The report identifies further studies and assessments that may be required. These include an Environmental Impact Assessment, Water Framework Directive (WFD) assessment, Habitat Regulations Assessment, Marine Licence application and other consents and permits that may be required such as a Flood Risk Activity Permit, Coast Protection Act 1949 (CPA) consent and consent to work in a SSSI. An initial Preliminary Ecological Assessment (Arcadis 2019)[30] has also been undertaken that provides details of initial surveys and ecological/ environmental requirements and the processes to be undertaken. • **Statutory procedures** (refer to detail of statutory procedures provided below) – Liaison/ consultation with NRW will be important at all stages of the development of the proposal. • **Land matters** – Sufficient land access and ownership arrangements would need to be put in place to allow the delivery and future maintenance of the PHL.

Statutory Procedures/ Legal Requirements	**Penarth Active Travel Network** (PHL considered separately below):
	• **Environmental and ecological processes** –
	  • As required following further feasibility work; and
	  • Proposals that involve the widening of existing off-road footpaths would need to consider SUDs legislation.
	• **Planning permission** – Majority of current proposals unlikely to require planning approval as within the boundaries of the existing highway network. Some small sections of off-road route may require planning approval.
	• **Traffic Regulation Orders (TROs)** – TROs would be required for the introduction of a 20mph limit and any parking restrictions near junctions.

[27] Vale of Glamorgan Council Penarth Headland Link – Stage 1 Maritime and Geotechnical Review, Arup, April 2018
[28] WelTAG Stage Two meeting with Vale of Glamorgan Council officers, 30th April 2019
[29] Vale of Glamorgan Council Penarth Headland Link – Environmental Planning Review, RSK, March 2019
[30] Vale of Glamorgan Council Penarth Headland Link – Preliminary Ecological Assessment, Arcadis, 2019

	PHL:
	• **Environmental and ecological processes** –
	  • The option will require an Environmental Impact Assessment due to the location of the proposal within the Severn Estuary (RAMSAR, SSSI, SAC, SPA);
	  • Any proposed works or plans that could potentially affect the Severn Estuary will need to undergo a Habitats Regulations Assessment in accordance with the Conservation of Habitats and Species Regulations 2017;
	  • Further studies and assessments required include a Water Framework Directive assessment, Marine Licence application; and
	  • Other consents and permits may be required such as a Flood Risk Activity Permit, CPA consent and consent to work in a SSSI.
	• **Planning permission** – Vale of Glamorgan Council has sought Legal Counsel opinion and it is understood that the scheme could rely on the deemed planning permission under the Cardiff Bay Barrage Act 1993 (CBBA). The planning approval requirements for the PHL will require further investigation as the scheme is further developed.
	• **Land purchase and Compulsory Purchase Order** – Land purchase may be required to deliver the PHL proposal – further investigation of land requirements will be needed during the development of the scheme.

Risks and Deliverability Issues	**Penarth Active Travel Network** (PHL considered separately below): • Construction of the network along built-up residential streets will have traffic management implications, particularly within the town centre environment and at key junctions; • Current proposals are considered to have a limited environmental or ecology impact as the majority of improvements would be within the existing highway boundary; • No land issues identified as the majority of improvements would be within the existing highway boundary; • High level of capital investment needed to deliver all the Active Travel proposals within the network; and • There could be a degree of public opposition to proposals to introduce cycling on existing pedestrian-only footpaths along the headland, which is a section of the Wales Coastal Path. PHL: • High cost scheme requiring a high level of capital investment – requires further feasibility and design work to develop a more robust cost estimate; • Technically complex proposal to design, plan and construct; • Environmental and ecological considerations associated with the proposal's development and implementation e.g. the site lies within the Severn Estuary is a site of national and international importance i.e. RAMSAR site, SSSI, SAC, SPA; • Timescales required by environmental requirements and in getting NRW consent could impact on the programme for delivery e.g. the 2019 RSK report identifies that at least 1 year would be required to complete the necessary studies, assessments and licensing;

	• Maintenance and operational requirements of the proposal would need detailed consideration throughout its development; and • Agreement would be needed on the roles and responsibilities of involved parties in the construction and maintenance of the PHL e.g. Vale of Glamorgan Council, Cardiff Harbour Authority.

Table 6.2 – Scheme development considerations for Option 2

Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	
Development Stages	• **Additional evidence** – Additional survey work required e.g. surveys to identify timings and variance of lock gate openings on the Barrage, trials with vehicles to assess the timing implications of the bascule bridges and potential conflict with other users, risk assessment of vehicle trial. • **Feasibility work** – Further development of proposal will require consideration of: - The impact of the operational nature of the barrage to the proposed bus service; - The route into Cardiff City Centre and any associated bus priority improvements required; - The impact of the proposal on Cosmeston Lakes Country Park; - Wider Cardiff Bay development proposals; and - Development of the bus service proposal e.g. the feasibility of extending the Baycar 6 service, the impact of barrage maintenance requirements and events held on the barrage to the operation of the service and the need for an alternative route to operate during such periods. • **Design work** – Outline and detailed design of the option – includes associated work such as topographical surveys and the development of cost estimates. Design of the Barrage section will include e.g. detailed consideration of the pedestrian and cyclist environment and any modifications required along the length of the barrage, assessment of barrier function and design, improvement of the function/ design of the barrage structures area for all users; • **Environmental and ecological work** – Additional work required to inform the statutory procedures required (refer to detail below) e.g. Preliminary Ecological Assessment to inform the requirement for targeted ecological surveys. • **Statutory procedures** (refer to detail below) – Liaison/ consultation with statutory bodies and service providers as necessary e.g. Welsh Government, NRW, bus operators, Cardiff Harbour Authority and Cardiff Council. • **Land matters** – Further investigation required of the two proposed options for the new section of 'busway' required at the northern end of the barrage to identify a preferred route alignment. Preferred option could require land purchase – the two options are on land owned by either Association of British Ports (ABP) or the Welsh Government.
Statutory Procedures/ Legal Requirements	• **Environmental and ecological processes** – • The option is likely to require an Environmental Impact Assessment due to the proximity of the proposal to the Severn Estuary (RAMSAR, SSSI, SAC, SPA) and Cosmeston Lakes Country Park (SSSI, Local Nature Reserve); • Any proposed works or plans that could potentially affect the Severn Estuary will need to undergo a Habitats Regulations Assessment in accordance with the Conservation of Habitats and Species Regulations 2017; and • Delivery of new highway infrastructure will need to consider SUDs legislation.

	• **Planning permission** – The option is likely to require planning approval, but this will need to be confirmed when the preferred location of the park and ride and alignment for the bus route is determined. • **Land purchase and Compulsory Purchase Order** – Land purchase may be required to acquire land for delivery of the bus link from the barrage into Cardiff Bay if agreement with the landowner cannot be reached. • **Traffic Regulation Orders (TROs)** – TROs may be required depending on the final scheme design.
Risks and Deliverability Issues	• High level of capital investment needed to deliver the proposal; • Potential for public opposition to the introduction of buses onto Cardiff Barrage and the siting of the park and ride facility at Cosmeston Lakes Country Park; • Development of the park and ride facility likely to require development of a greenfield site; • Technical and operational challenges relating to the introduction of buses on Cardiff Barrage; • Need to ensure the design of the bus route does not have a negative impact on the walking and cycling route over Cardiff Barrage; • Preferred bus route alignment along Cardiff Barrage may require land acquisition; and • Cardiff Barrage is under the control of Cardiff Council and implementation of the Barrage element of the option would need to be led by Cardiff Council. • Potential ongoing revenue costs linked to the operation/ subsidisation of the bus service.

Table 6.3 – Scheme development considerations for Option 3

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	

Development Stages	• **Additional evidence** – Additional survey work required to develop:
	  • A better understanding of park and ride demand and station catchment area (e.g. surveys of existing usage, user needs and travel patterns); and
	  • The impact of the proposal on the local highway network and key junctions in the vicinity of the station (e.g. traffic surveys and forecasting).
	• **Feasibility work** – Further development of the Masterplan for the Cogan site is required that should consider the following:
	  • Any wider and longer-term development proposals (e.g. affecting the rail network, land use developments in the local area such as the proposed Wellbeing Hub on the Penarth Leisure Centre site) to ensure proposals for Cogan are not developed in isolation and to ensure integration and connectivity between Cogan Station and development sites;
	  • The feasibility of larger-scale improvements to the highway network to accommodate the proposed development e.g. improved access arrangements into the site, potential for capacity improvements to Cogan Hill roundabout;
	  • Wider Active Travel links and improvements to the site to ensure routes to Cogan Station are improved from all areas including connections to Cardiff e.g. from Pont-y-Werin and Penarth Marina, from Llandough, from routes to the west of the station etc.; and
	  • Identification of a final preferred option for the Cogan Multi-Modal Interchange scheme based on user needs and the constraints of the site.
	• **Design work** – Outline and detailed design of the option – includes associated work such as topographical surveys and the development of cost estimates.
	• **GRIP process** – As with all projects that impact on the operational railway, the GRIP process will need to be progressed alongside the development of the scheme.
	• **Environmental and ecological work** – Additional work required to inform the statutory procedures required (refer to detail below) e.g.
	  • Consideration of any air quality requirements due to a previous AQMA designation along a section of Windsor Road;
	  • Consideration of the impact of the proposed scheme to the Grade II listed Cogan footbridge; and
	  • Preliminary Ecological Assessment to inform the requirement for targeted ecological surveys. The railway corridor is identified as having the potential to provide shelter and foraging opportunities for bats, birds, dormice, badger and reptiles.
	• **Statutory procedures** (refer to detail below) – Liaison/ consultation with statutory bodies and service providers as necessary e.g. Welsh Government, Transport for Wales, NRW.
	• **Land matters** – Current proposal does not require land purchase as land proposed for expanded park and ride site is within Welsh Government ownership.

	• **Additional stages** – May be required as the Cogan Multi-Modal Interchange scheme is further developed e.g. more ambitious proposals may have land requirements or tie into wider development proposals.

Statutory Procedures/ Legal requirements	• **Environmental and ecological processes** –
	  • Environmental and ecological requirements would need to be determined as the proposal is further developed e.g. potential requirement for an Environmental Impact Assessment;
	  • Delivery of new infrastructure will need to consider SUDs legislation.
	• **Planning permission** – The option is likely to require planning approval, but this will need to be confirmed when a final preferred option for the development of the site is available.
	• **Land purchase and Compulsory Purchase Order** – Current proposal does not require land purchase, but any land requirements would need to be confirmed when details of the final preferred scheme are available.
	• **Traffic Regulation Orders (TROs)** – TROs may be required depending on the final scheme design.

Risks and Deliverability Issues	• Option is at a very early stage of development – further development and design work required to develop a more robust cost estimate and to better understand the impact of the proposed scheme on the local highway network; • High level of capital investment needed to deliver the proposal; • Technical challenges in delivering improvements on operational railway land and due to levels/ topography of the site; • Constraints of the site may impact on the package of measures that can be delivered; • Constrained nature of the local road network and topographical constraints may limit the extent of highway improvements that can be delivered; • Involvement of different parties in progressing the proposal i.e. Welsh Government leading on land purchase, rail elements will need to be progressed and delivered by Transport for Wales, Vale of Glamorgan Council has responsibility for the local highway network; • Current proposal will need to accommodate movements from the operational Travis Perkins site; • Need to coordinate scheme development with station improvements planned by TfW and wider development proposals e.g. longer-term rail proposals, previous proposals for housing development on the site, other development proposals in the area such as the new Wellbeing Hub on the Cogan Leisure Centre site; • An Air Quality Management Area has previously been in place along a section of Windsor Road – need to ensure the proposal would not have a negative impact on local air quality; and • Further scheme development may result in a proposal that requires land acquisition.

6.4 Governance, Project Management and Reporting

The governance structure of the WelTAG Stage One and Stage Two work has involved the establishment of a Review Group as required by WelTAG 2017. The guidance states that 'the purpose of the Review Group is to consider the contents of the WelTAG Stage Reports, assess each of the options presented and decide on the actions to be taken at the end of that WelTAG stage.'

The Review Group was set up as part of the Strategic Outline Case stage of the WelTAG process (Stage One). The members of the WelTAG Stage One Review Group included the Vale of Glamorgan Council Scheme Project Manager, the Head of Neighbourhood Services and Transport as the Senior Responsible Owner (SRO) and included consideration by the Council's Penarth Project Board. The Review Group was responsible for considering the output of the WelTAG Stage One (Strategic Outline Case) report, each of the options presented and deciding on the actions to be taken forward to a WelTAG Stage Two appraisal.

The WelTAG Stage Two Review Group membership has been broadened to involve individuals from a range of backgrounds and expertise across the four aspects of well-being i.e. social, cultural, environmental and economic. The Review Group includes representatives from the following organisations:

- Vale of Glamorgan Council (Members and Officers);
- Welsh Government;
- Transport for Wales;
- Cardiff Capital Region City Deal;
- Sustrans;
- Public Health Wales;
- Network Rail;
- Keolis Amey;
- Cardiff Bus;
- NAT Group;
- Cardiff Council;
- Vale 50+ Forum;
- Vale of Glamorgan Youth Participation;
- Llandough Community Council;
- Penarth Town Council; and
- Sully Town Council.

The Review Group will review the contents of this WelTAG Stage Two Report and decide on the actions to be taken. Details of the outcomes of this review and the decisions made by the Review Group are included in Chapter 7: Conclusions and Recommendations.

The WelTAG Stage One and Stage Two work has been project managed by Arcadis Consulting UK Ltd on behalf of the Vale of Glamorgan Council. The communication and stakeholder management aspects relating to the WelTAG Stage Two study, including promotion of consultation activities and project reporting requirements, have been coordinated by the Vale of Glamorgan Council/ Arcadis Consulting UK Ltd.

The development of a preferred option beyond WelTAG Stage Two will require further project governance structures and project management processes to be put in place e.g. the setting up

of a Project Board, a more formalised communications and stakeholder management plan and development of a Project Plan. The Project Plan will need to include a staged approach to scheme development that requires approval checks at various development stages/ milestones, which will initiate a review of the project prior to the scheme being progressed further. This will be particularly important given the scale of some of the options being considered by this WelTAG Stage Two Report.

6.5 Summary of Management Case

The WelTAG Stage Two Management Case has provided an overview of the key development stages required for each option and the statutory procedures that may need to be undertaken. This has considered the development of each option in relation to:

- Additional evidence that may need to be obtained to assist scheme development;
- Feasibility and design work required;
- Environmental and ecological requirements;
- Statutory procedures/ legal requirements; and
- Land matters.

It is evident from the Management Case that each option under consideration requires significant further development work prior to scheme delivery. The Active Travel proposals within Option 1 (other than the PHL) would require the least scheme development work, which is largely reflective of the relatively small-scale nature of the proposals in comparison to the other options under consideration.

The Management Case has also included an assessment of risks and deliverability issues affecting each option, which will need to be further developed and quantified as any recommended options are progressed to WelTAG Stage Three. Other aspects considered by the management case are the governance structure, project management processes and the role of the WelTAG Review Group.

7. Conclusion and Recommendations

7.1 Summary

In May 2019, a WelTAG Stage One assessment developed and appraised a number of sustainable transport options for the Penarth to Cardiff Barrage Corridor.

This WelTAG Stage Two Report has considered in greater detail the following three shortlisted options recommended by that WelTAG Stage One report. These are

- Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor;
- Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage; and
- Option 3 – Cogan Multi-Modal Sustainable Transport Interchange.

The shortlisted options have been further developed as part of the WelTAG Stage Two study to enable a more detailed appraisal of each option to be undertaken. Stakeholder and public consultation activities have been undertaken at WelTAG Stage Two and informed the development and appraisal of options. The WelTAG Stage Two process has involved a Five Case assessment for each of the shortlisted options, which has considered the strategic, transport, financial, commercial and management cases for each option.

The contribution of each option towards the national well-being goals has been a key consideration in the appraisal process and has influenced the recommendations made by the WelTAG Stage Two Report.

7.2 Recommendations

WelTAG 2017 states that the WelTAG Stage Two process should 'determine whether there are any transport options that can address the issues identified, contributes positively to the well-being goals and objectives and can be delivered within technical and financial constraints' and then 'select a preferred option to be taken forward to Stage Three'.

A point that was raised repeatedly during the WelTAG Stage Two public consultation is that the three shortlisted options being considered are not mutually exclusive and would not necessarily have to be delivered in isolation. There was a common view that there could be benefits to the study area if more than one of the options were delivered or if the most beneficial aspects of more than one of the options were packaged together and progressed in tandem. This point was reflected during the appraisal process, which has shown that there is not necessarily a single option that will make the most positive contribution to the study objectives and wider well-being goals. In addition, despite the additional development work that has been undertaken to inform this WelTAG Stage Two process, each of the options remain at an early stage of development and it is considered that further development work is needed to better understand the extent that options will lead to the desired outcomes.

As such, it is not considered appropriate that the this WelTAG Stage Two study recommends a single option be progressed. Instead it is recommended that more than one of the shortlisted option be taken forward to the next WelTAG stage. Due to the varied nature of the options under consideration and the different development stages of each option, it is recommended that those

options to be progressed should be treated as stand-alone projects at WelTAG Stage Three and considered by individual Stage Three reports. It should be noted that each option requires further feasibility and design work prior to being in a position to develop a Stage Three report. It is recommended that the scheme development work should progressed to an appropriate level in the first instance so it is available to inform the WelTAG Stage Three report.

A general recommendation in relation to those options that are progressed further, is the need to ensure that options are not developed in isolation but are developed in light of wider developments, proposals and studies that are being undertaken across the area. This includes proposals for rail or highway improvements, proposed housing developments etc. Such wider linkages were raised repeatedly through the stakeholder and public consultation activities.

The following section provides a summary of the proposed recommendations for each option that has been considered by this WelTAG Stage Two Report. Due to the complexity of the options under consideration, each option is treated in turn in the following section.

Recommendations for Option 1 – Active Travel Proposals for the Penarth to Cardiff Barrage Corridor

Following the WelTAG Stage Two appraisal work that has been undertaken and the feedback from the stakeholder and public consultation exercises, it is recommended that the network of Active Travel links within Option 1 be taken forward to WelTAG Stage Three for further development and analysis.

Option 1 performed most positively of all the options throughout the Strategic Case appraisal and was the most well-supported of the three options and received the most positive responses during the WelTAG Stage Two consultation activities. The Transport Case economic assessment of Option 1 produced a BCR range of 1.25 to 3.86, which represents BCR values ranging from low to high value for money. The level of value for money is affected greatly by the cost associated with the PHL and potential wider impacts such as tourism benefits. The BCR range reflects the PHL scenarios considered by the economic assessment of Option 1 i.e. scenarios that take account of the lower and higher cost estimates currently available for the PHL, the inclusion of wider economic benefits in an adjusted BCR and a sensitivity test to take account of a potentially lower usage of the PHL. Further development of the PHL proposal will enable the BCR to be revisited and refined. Option 1 scored most positively of the three options against the economic, environmental, social and cultural criteria in the Transport Case appraisal.

A further recommendation in relation to Option 1 is that for WelTAG Stage Three, the PHL should be considered separately to the other Active Travel proposals within Option 1. This will require two separate WelTAG Stage Three reports to be developed for the Penarth Active Travel Network (hereafter referred to as Option 1A) and for the PHL (hereafter referred to as Option 1B) respectively[31]. The reasons for this recommended separation are as follows:

- The different development requirements of the PHL and the wider Active Travel proposals within Option 1 have been highlighted throughout the WelTAG Stage Two work. This is largely

[31] For clarity, the variations of Option 1 referenced throughout this Report (e.g. in the Transport Case) are as follows:
- Option 1 – Active Travel Proposals for the Penarth to Cardiff Barrage Corridor (includes PHL);
- Option 1A – Penarth Active Travel Network i.e. all proposals within Option 1 other than the PHL; and
- Option 1B – PHL only.

due to the scale of the PHL and the nature of the proposal. For example, the extent of development work needed for the PHL will be sufficiently greater, more wide-ranging and require longer timescales than that needed for the smaller-scale Active Travel proposals across the rest of the network.

- A point that has been highlighted by the economic assessment undertaken for WelTAG Stage Two, which will be important in the further development of the scheme, is that the PHL proposal cannot be justified solely on its transport-related benefits. The majority of economic benefits of the PHL are derived from physical benefits experienced by leisure and recreational users of the PHL and wider economic benefits e.g. in relation to leisure and tourism. It is therefore recommended that the PHL proposal should not be progressed solely as a transport scheme but that its business case should be developed more widely to reflect its potential wider leisure and tourism benefits. The funding package for the scheme should similarly aim to identify funding sources that are reflective of these wider benefits of the scheme.

Due to these factors and due to the complex and large-scale nature of the PHL proposal, it is recommended that the work required to develop the proposal and the WelTAG Stage Three process should be progressed independently of the other Active Travel proposals within Option 1.

It is recommended that the development of the Penarth Active Travel Network (Option 1A) should take into account feedback from the WelTAG Stage Two stakeholder and public consultation in the future development of the option. A key point raised though the consultation activities is that the current proposals for Active Travel improvements across the network should be more ambitious. The proposals are based on the existing INM alignments and identify improvements within the constraints of the existing highway network. However, feedback from the stakeholder and public consultation highlighted that the proposals should identify more ambitious improvements for Active Travel. It is therefore recommended that the future development of Option 1A should consider options beyond the current INM network and consider wider links e.g. to schools or to proposed bike hire locations. More substantial changes to the highway network to prioritise pedestrians and cyclists should be considered in the development of Option 1A, which would potentially have a greater impact on increasing levels of Active Travel.

Recommendations for Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage

As a result of the WelTAG Stage Two work that has been undertaken and the feedback from the stakeholder and public consultation exercises, it is recommended that Option 2 should not be taken forward to WelTAG Stage Three at this stage.

In terms of the Strategic Case appraisal, Option 2 received the most negative responses during the WelTAG Stage Two consultation activities, particularly in relation to the potential impact that the introduction of buses on Cardiff Barrage could have on the existing Active Travel route. The Transport Case economic assessment of Option 2 produced a BCR of 0.25, which represents poor value for money. This is due to the significant funding required to subsidise the park and ride bus service, the limited transport demand for the service and the low level of benefits produced. Overall, Option 2 scored the least positively of the three options against the economic, environmental, social and cultural criteria in the Transport Case appraisal.

The WelTAG Stage Two assessment of Option 2 has highlighted key factors that will reduce the attractiveness of the bus park and ride proposal:

- The location of the bus park and ride facility will impact on usage levels of the facility, as it is located away from the main A4055 highway network and will require drivers to divert some distance from their existing route to use the facility;
- The location of the park and ride to the south of Penarth is likely to attract a relatively limited catchment. It would mainly attract users from the Lower Penarth, Sully and Cosmeston areas and not attract users from Penarth itself or from areas further afield such as Barry. Issues relating to the proposed location of the park and ride was a common theme raised through the stakeholder and public consultation;
- A further issue is the proposed bus route between the park and ride and the barrage. The existing highway network through Penarth is constrained due to on-street parking and the highway space available, particularly at key junctions along the route, which limits the scope of any bus priority measures that could be implemented and subsequent journey time savings;
- The operational nature of the barrage limits the frequency of the bus service that can be provided, which will reduce the attractiveness of the park and ride as a 'turn up and go' travel option; and
- It is likely that the park and ride bus service would require ongoing revenue support and that this would be better spent improving existing bus services or pump priming the existing network.

It should be noted that a large number of concerns were raised at both the stakeholder workshop and through the public consultation about the impact of the proposal on the existing walking and cycling environment of the barrage. Many comments were received about the importance of the 'traffic-free' nature of the barrage, that it should be kept as a core and 'flagship' Active Travel route and the impact that the introduction of buses onto the barrage would have on the perceived (and actual) safety of the route to pedestrians and cyclists. The potential for public opposition to the introduction of buses onto Cardiff Barrage is considered a key risk to Option 2.

It is acknowledged that Cardiff Council may continue to be interested in the development of a bus route over Cardiff Barrage linking Penarth and Cardiff without the wider park and ride element. It is further acknowledged that this WelTAG Stage Two study has focused on Option 2 as a whole and has not considered the benefits of stand-alone elements of the wider proposal. However, it is recommended that any future development of this proposal by Cardiff Council should be mindful of the views expressed during the WelTAG Stage Two stakeholder and public consultation. The design of any future proposal for Cardiff Barrage would need to carefully consider the impact on the existing Active Travel environment to ensure conflict between pedestrians, cyclists and vehicles and any negative impacts of the introduction of buses onto the barrage are minimised.

This WelTAG Stage Two Report recommends that the proposal for a bus park and ride facility at Cosmeston Lakes Country Park is not taken forward to WelTAG Stage Three at this stage. However, it is acknowledged that the provision of a park and ride facility or a wider transport interchange at a location in the Eastern Vale of Glamorgan area remains an important aspiration as a means of encouraging reduced car use for journeys to and from Cardiff e.g. commuting journeys from Barry. It is likely that a future strategic review will be needed of potential locations for such a facility in order to consider potential demand and changing circumstances e.g. longer term development proposals. Any future work that is undertaken to establish the most appropriate and feasible location for a facility would need to be fully integrated with wider developments taking place across the area e.g. proposed housing developments at Cosmeston and future Metro proposals for the corridor. A future review of potential locations for a facility will also need to inform the LDP Review process, due to the proposal for a bus park and ride at Cosmeston being a policy within the LDP.

The proposal for a bus park and ride facility at Cosmeston is included within the Vale of Glamorgan's LDP as Policy SP7(8) 'Bus park and ride at Cosmeston, Penarth'.

Due to the outcome of this WelTAG Stage Two assessment in relation to Option 2, it is recommended that consideration should be given to removing the proposal for a bus park and ride at Cosmeston from the LDP as part of the LDP review.

Recommendations for Option 3 – Cogan Multi-Modal Sustainable Transport Interchange

As a result of the WelTAG Stage Two work that has been undertaken and the feedback from the stakeholder and public consultation exercises, it is recommended that the Cogan Multi-Modal Interchange proposal (Option 3) be further developed with the intention of taking the scheme forward to WelTAG Stage Three. It is recommended that a partnership approach between Transport for Wales and Vale of Glamorgan Council is needed to take forward the work on Option 3. The involvement of Transport for Wales will ensure planned rail improvements and wider proposals for the rail network are fully incorporated into the development of the proposal. The involvement of Vale of Glamorgan Council will ensure that wider considerations, such as those relating to Active Travel and the local highway network, form a key part of the proposals that are progressed. Close collaboration will be essential to ensure all elements and priorities are fully considered in developing the proposals.

Option 3 performed well in the Strategic Case appraisal and recorded a positive or neutral impact throughout the appraisal. Responses received through the WelTAG Stage Two consultation in relation to Option 3 were mixed, which could reflect the variety of improvements proposed by Option 3. For example, positive comments were received in relation to the proposed Active Travel and accessibility improvements, with more negative comments received in relation to the potential impact on traffic levels and congestion. The Transport Case economic assessment of Option 3 produced a BCR of 3.06, which represents high value for money. This is mainly due to the significant vehicle operating cost and parking charge savings gained by users transferring from

the car to train. Option 3 performed well in the Transport Case appraisal, with no negative ratings against any of the economic, environmental, social or cultural criteria.

It is considered that the development of the scheme is at too early a stage to enable the full benefits and costs of the proposal to be fully understood. It is recommended that Option 3 requires more feasibility work and should be taken forward to the next WelTAG stage to enable the proposal to be further developed. This will enable detailed consideration to be given to the concerns raised during the stakeholder workshop and public consultation. It is recommended that the additional feasibility work be completed in the first instance and the business case reviewed to ensure it is still positive, prior to a WelTAG Stage Three report being progressed. This feasibility work should confirm the elements of the scheme that will be taken forward and also develop a better understanding of user needs and the demand for the scheme elements. This will ensure that a final preferred option for the scheme is available prior to the WelTAG Stage Three report being progressed. The further work required is detailed in Section 7.3 below.

A specific concern raised through the stakeholder and public consultation was the potential impact of the proposal on the local highway network, which already experiences problems of congestion e.g. along Windsor Road, at Cogan Hill roundabout and Barons Court junction, which are all in close proximity to Cogan Station. The development of the scheme should incorporate any highway improvements considered necessary to accommodate the additional traffic e.g. consider the feasibility of improving Cogan Hill roundabout. The traffic impact of the proposal on the local highway network will need to be a key consideration in the development of Option 3 and will need to be considered in the context of wider proposed developments in the area e.g. the proposed Well-being Hub at Cogan Leisure Centre. As with all options, it is important that Option 3 is not developed in isolation and should take account of its wider context. For example, consideration should be given to other stations in the area in terms of planned, future and potential improvements.

It is recommended that the development of Option 3 strongly focuses on improving Active Travel links to the station from all areas. This point was raised repeatedly through the public consultation such as the need to improve links to Cogan Station from e.g. Pont-y-Werin and Penarth Marina including the crossing of Cogan Hill, Llandough and routes to the west of the station. Although the cost estimate developed for this WelTAG Stage Two study does include Active Travel improvements, it is recommended that the emphasis on Active Travel be extended in the further development of the scheme and that it should become a key part of the overall proposal. In addition, the future development of the Cogan Interchange proposal should be mindful of associated Active Travel improvements identified in Option 1.

7.3 Further Work

This section sets out the further work that is required for each of those options that are recommended to be progressed to WelTAG Stage Three.

The further work required for each option was considered in Chapter 6: Management Case, which highlighted the development work that is applicable to all options i.e.

- Project management processes that will need to accompany the development of each of the options e.g. development of a project plan and delivery programme,

- Further stakeholder engagement and potentially further public consultation that will be required during the development of each of the options, and
- Business case development – Further work to develop each option and obtain more robust cost estimates will inform the business case for the proposal, which will be important for WelTAG Stage Three. The ongoing development of the Five Cases (Strategic, Transport, Financial, Commercial and Management) will be an important aspect of scheme development. Development of a funding package for scheme delivery will be an important consideration in the development of the business case.

The Management Case identified the development stages required by each option and potential statutory procedures that would need to be followed. The further work for each option is summarised in the tables and additional information below.

Further Work Required for the Penarth Active Travel Network (Option 1A)

A summary of the further work required to develop Option 1A to a pre-delivery stage is included in Table 7.1.

Table 7.1 – Summary of Further Work for Option 1A

Option 1A – Penarth Active Travel Network	
Development Stages	**Penarth Active Travel Network** (PHL considered separately below): • **Additional evidence** – Additional survey work required to gain a better understanding of current and potential future usage of the network. • **Feasibility work** – Further development of proposed Active Travel network through an area-wide study to e.g. review existing proposals, develop more ambitious proposals, identify alternative links if feasible and appropriate, consider additional links e.g. to schools, consider phasing of delivery of the network, determine extent of a 20mph limit. • **Design work** – Outline and detailed design of network (in line with agreed phasing) – includes associated work such as topographical surveys and the development of cost estimates. • **Environmental and ecological work** – Additional work required to inform the statutory procedures required (refer to detail below) e.g. Preliminary Ecological Assessment to inform the requirement for targeted ecological surveys. • **Statutory procedures** (refer to detail below) – Liaison/ consultation with statutory bodies and service providers as necessary e.g. NRW. • **Land matters** – Current Active Travel proposals will not require land purchase. • **Additional stages** – May be required as the Active Travel network is further developed e.g. more ambitious proposals may have land requirements.

Statutory Procedures/ Legal Requirements	**Penarth Active Travel Network** (PHL considered separately below):
	• **Environmental and ecological processes** –
	  • As required following further feasibility work;
	  • Proposals that involve the widening of existing off-road footpaths would need to consider SUDs legislation.
	• **Planning permission** – Majority of current proposals unlikely to require planning approval as within the boundaries of the existing highway network. Some small sections of off-road route may require planning approval.
	• **Traffic Regulation Orders (TROs)** – TROs would be required for the introduction of a 20mph limit and any parking restrictions near junctions.

A key aspect of the further work required to develop Option 1A is the feasibility work needed to refine and further develop the network proposals. As highlighted in Section 7.2, it is recommended that the development of the Penarth Active Travel Network should reflect stakeholder and public consultation feedback that proposals should be more ambitious. This will need to be incorporated into the feasibility work that is undertaken. It is considered that the feasibility work in developing the Active Travel network should incorporate the following steps:

- Undertake a detailed area-wide Active Travel study, which should develop a better understanding of current and potential future usage of the network (e.g. through surveys of

existing routes), further develop the design of proposals within Option 1A and develop more ambitious proposals for the Active Travel network where feasible. These could include the potential use of Traffic Management measures to alter the highway network and give more priority to walking and cycling (e.g. the use of road closures or one-way systems) or the potential of land acquisition to deliver more substantial Active Travel improvements (e.g. to improve routes into rail stations).

- The study should look in greater detail at the options for improvements along each of the routes. The WelTAG Stage Two report has identified initial proposals and an associated estimated cost for each route. However, it is recognised that some links would benefit from a more in-depth consideration of whether greater improvements are feasible. Examples are:
  - The proposed route along The Esplanade, which has constraints of parking and high pedestrian flows and needs a more detailed consideration of feasible options to enable a two-way cycle route to be implemented;
  - The proposed route along B4267 Redlands Road, which would benefit from more substantial off-road improvements if there is sufficient highway width available and needs consideration of how the route would tie into Andrew Road at the busy Merrie Harrier junction; and
  - The proposed improvement to the Stanwell Road/ Plymouth Road/ Hickman Road signalised junction, which would benefit from more detailed consideration of the options available to improve the junction as a whole for pedestrians and cyclists e.g. through consideration of pedestrian movements at the junction and whether additional crossing movements and alterations to traffic signals would be beneficial.
- The Active Travel study should also consider whether additional links could be included within the network to reflect feedback from the stakeholder and public consultation and increase walking and cycling opportunities for the whole of the study area e.g. additional links to rail stations, residential areas, proposed bike hire sites and ensuring routes link to schools within the study area.
- The study should include the prioritisation of links within the Active Travel network and identify any ‘quick-win’ improvements that could be delivered within a short timescale.
- Detailed consideration is required of the extent of a 20mph zone/ limit within the study area and consideration of whether this could be progressed independently of the wider Active Travel improvements.

Further work required for the PHL (Option 1B)

A summary of the further work required to develop Option 1B to a pre-delivery stage is included in Table 7.2.

Table 7.2 – Summary of Further Work for Option 1B

Option 1B – Penarth Headland Link	

Development Stages	• **Additional evidence**
	  • Additional survey work required to gain a better understanding of likely demand for the PHL;
	  • Further development of the wider economic assessment of the scheme e.g. in relation to leisure, tourism, user welfare benefits and wider development opportunities;
	  • Additional evidence required to inform further maritime and geotechnical studies as detailed in a 2018 Arup report[32] e.g. acquisition of offshore wave data, numerical modelling to determine seastate conditions for detailed designs.
	• **Feasibility work** – The design and cost of the PHL proposal is based on an 'outline concept design' as detailed in Section 3.2 of this report. This proposed design and cost estimate will require a detailed independent review to confirm the feasibility of the proposal and provide more surety to the cost range that has been developed to date. Feasibility work will need to have regard to the restrictions of the Cardiff Bay Barrage Act 1993 in developing the design of the PHL.
	• **Design work** – Outline and detailed design of the proposal – will need to be informed by geotechnical and environmental considerations and will include the development of a more robust cost estimate. Due to the location and nature of the scheme, the construction strategy will need to be considered throughout the development of the design.
	• **Geotechnical considerations** – A 2018 Arup report[32] undertook a review of maritime and geotechnical matters in relation to the PHL proposal and identified the further maritime and geotechnical works required to progress the development of the scheme. This includes e.g. an assessment of the impacts of the proposed scheme on coastal processes, Joint Probability Assessment of wave heights and water levels, further assessment of rock fall hazards etc. A copy of the further work identified by this study is included in Appendix 7 of the IAR. These will be key factors affecting the design of the scheme. In addition, consultation with Vale of Glamorgan Council officers[33] has highlighted the need to ensure any studies and modelling work incorporate the latest climate change/ sea level forecasts and that the potential coastal protection implications of a future drift reversal are considered when developing the proposal.
	• **Environmental and ecological work** – A 2019 RSK report[34] has reviewed the legislation to be considered in relation to environmental planning matters. The report identifies further studies and assessments that may be required.

[32] Vale of Glamorgan Council Penarth Headland Link – Stage 1 Maritime and Geotechnical Review, Arup, April 2018
[33] WelTAG Stage Two meeting with Vale of Glamorgan Council officers, 30th April 2019
[34] Vale of Glamorgan Council Penarth Headland Link – Environmental Planning Review, RSK, March 2019

	These include an Environmental Impact Assessment, Water Framework Directive (WFD) assessment, Habitat Regulations Assessment, Marine Licence application and other consents and permits that may be required such as a Flood Risk Activity Permit, Coast Protection Act 1949 (CPA) consent and consent to work in a SSSI. An initial Preliminary Ecological Assessment (Arcadis 2019)[35] has also been undertaken that provides details of initial surveys and ecological/ environmental requirements and the processes to be undertaken. • **Statutory procedures** (refer to detail of statutory procedures provided below) – Liaison/ consultation with NRW will be important at all stages of the development of the proposal. • **Land matters** – Sufficient land access and ownership arrangements would need to be put in place to allow the delivery and future maintenance of the PHL.

Statutory Procedures/ Legal Requirements	• **Environmental and ecological processes** –
	  • The option will require an Environmental Impact Assessment due to the location of the proposal within the Severn Estuary (RAMSAR, SSSI, SAC, SPA);
	  • Any proposed works or plans that could potentially affect the Severn Estuary will need to undergo a Habitats Regulations Assessment in accordance with the Conservation of Habitats and Species Regulations 2017;
	  • Further studies and assessments required include a Water Framework Directive assessment, Marine Licence application;
	  • Other consents and permits may be required such as a Flood Risk Activity Permit, CPA consent and consent to work in a SSSI.
	• **Planning permission** – Vale of Glamorgan Council has sought Legal Counsel opinion and it is understood that the scheme could rely on the deemed planning permission under the Cardiff Bay Barrage Act 1993 (CBBA). The planning approval requirements for the PHL will require further investigation as the scheme is further developed.
	• **Land purchase and Compulsory Purchase Order** – Land purchase may be required to deliver the PHL proposal – further investigation of land requirements will be needed during the development of the scheme.

As detailed in the Management Case (Section 6.2), the above table considers the future development stages required but does not include detail of the more general aspects that are applicable to all options e.g. project management processes, business case development and stages beyond the scheme development stage. Due to the nature of the PHL proposal, some of these stages are given further consideration below:

- **Phasing of further work** – Due to the scale and complexity of the PHL proposal, the further work required will need to be progressed in clear and defined stages to enable a structured review process to be built into the development of the scheme. Advice should be sought at an early stage (e.g. from NRW) regarding the level of detail required about the PHL proposal to enable the appropriate approvals to be sought. It is considered that the outline design work

[35] Vale of Glamorgan Council Penarth Headland Link – Preliminary Ecological Assessment, Arcadis, 2019

should be progressed in the first instance to take the proposal to a stage that would enable the necessary approvals to be progressed. The outline design work will need to review the existing proposal and confirm whether this is the most appropriate design for the PHL. A review of the cost estimate of the proposal should accompany this work. This work will need to include consideration of the restrictions and requirements of the Cardiff Bay Barrage Act 1993 in developing a feasible design proposal. Geotechnical considerations will be a key factor influencing the design that is progressed and therefore the geotechnical work will also need to be progressed in parallel.

- **Stage gate approach** – It is recommended that a stage gate approach is adopted to ensure there are key milestones at which the proposal is reviewed to ensure its business case remains positive when reviewed against the latest development information. At each stage gate, a review of the project will need to be undertaken and a decision made about whether the project should proceed to the next stage. The development of the project programme should build in these stage gate reviews following any key outputs becoming available e.g. following completion of outline design, following review of the current cost estimate, following completion of any key geotechnical/ ecological/ environmental studies. The timeline within the project programme will need to make allowance for these stage gate reviews.
- **Project development timescales** – The project programme will need to incorporate the timescales required for the necessary environmental planning studies and assessments required. The 2019 RSK report provides an indicative timeline for undertaking these environmental planning requirements. This indicates that the EIA would require 1 year to be undertaken (provided that multi-year surveys are not deemed necessary), with a further period needed for the approval of the EIA. An additional 6 months should be allowed for NRW to process and consult on the Marine Licence application. Full detail of the timeframes suggested are included in the IAR in Appendix 7. The project programme should consider any wider issues that could impact on development timescales. For example, consultation with stakeholders has highlighted that the PHL could be viewed as going against the Shoreline Management Plan policy of 'hold the line' for the area, i.e. no active intervention where there are no defences, which could require Ministerial sign-off and have implications for project development timescales.
- **Business case development** – The ongoing development of the business case for the PHL will be important to ensure the most up-to-date cost information is incorporated, along with details of the wider benefits of the project e.g. leisure and tourism, social benefits, any wider development opportunities that may become apparent. Development of a funding package for scheme delivery will be an important consideration in the development of the business case.
- **Construction methods** – Due to the nature and location of the PHL proposal, the proposed construction methods will need consideration throughout the development of the design of the scheme.
- **Maintenance and operational issues** – Maintenance and operational requirements of the PHL proposal would need detailed consideration throughout its development. Design and operational parameters will need to be agreed as part of the development process e.g. due to the location of the PHL.

Further work required for the Cogan Multi-Modal Sustainable Transport Interchange (Option 3)

A summary of the further work required to develop Option 3 to a pre-delivery stage is included in Table 7.3.

Table 7.3 – Summary of Further Work for Option 3

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	

Development Stages	• **Additional evidence** – Additional survey work required to develop:
	  • A better understanding of park and ride demand and station catchment area (e.g. surveys of existing usage, user needs and travel patterns); and
	  • The impact of the proposal on the local highway network and key junctions in the vicinity of the station (e.g. traffic surveys and forecasting).
	• **Feasibility work** – Further development of the Masterplan for the Cogan site is required that should consider the following:
	  • Any wider and longer-term development proposals (e.g. affecting the rail network, land use developments in the local area such as the proposed Wellbeing Hub on the Penarth Leisure Centre site) to ensure proposals for Cogan are not developed in isolation and to ensure integration and connectivity between Cogan Station and development sites;
	  • The feasibility of larger-scale improvements to the highway network to accommodate the proposed development e.g. improved access arrangements into the site, potential for capacity improvements to Cogan Hill roundabout;
	  • Wider Active Travel links and improvements to the site to ensure routes to Cogan Station are improved from all areas including connections to Cardiff e.g. from Pont-y-Werin and Penarth Marina, from Llandough, from routes to the west of the station etc.; and
	  • Identification of a final preferred option for the Cogan Multi-Modal Interchange scheme based on user needs and the constraints of the site.
	• **Design work** – Outline and detailed design of the option – includes associated work such as topographical surveys and the development of cost estimates.
	• **GRIP process** – As with all projects that impact on the operational railway, the GRIP process will need to be progressed alongside the development of the scheme.
	• **Environmental and ecological work** – Additional work required to inform the statutory procedures required (refer to detail below) e.g.
	  • Consideration of any air quality requirements due to a previous AQMA designation along a section of Windsor Road;
	  • Consideration of the impact of the proposed scheme to the Grade II listed Cogan footbridge;
	  • Preliminary Ecological Assessment to inform the requirement for targeted ecological surveys. The railway corridor is identified as having the potential to provide shelter and foraging opportunities for bats, birds, dormice, badger and reptiles.

	• **Statutory procedures** (refer to detail below) – Liaison/ consultation with statutory bodies and service providers as necessary e.g. Welsh Government, Transport for Wales, NRW. • **Land matters** – Current proposal does not require land purchase as land proposed for expanded park and ride site is within Welsh Government ownership. • **Additional stages** – May be required as the Cogan Multi-Modal Interchange scheme is further developed e.g. more ambitious proposals may have land requirements or tie into wider development proposals.

Statutory Procedures/ Legal requirements	• **Environmental and ecological processes** –
	  • Environmental and ecological requirements would need to be determined as the proposal is further developed e.g. potential requirement for an Environmental Impact Assessment;
	  • Delivery of new infrastructure will need to consider SUDs legislation.
	• **Planning permission** – The option is likely to require planning approval, but this will need to be confirmed when a final preferred option for the development of the site is available.
	• **Land purchase and Compulsory Purchase Order** – Current proposal does not require land purchase, but any land requirements would need to be confirmed when details of the final preferred scheme are available.
	• **Traffic Regulation Orders (TROs)** – TROs may be required depending on the final scheme design.

As detailed in Section 7.2, it is considered that partnership approach is needed between Transport for Wales and Vale of the Glamorgan Council in taking forward the further work on Option 3. The involvement of Transport for Wales will ensure that planned rail improvements and wider proposals for the rail network are fully incorporated into the development of the proposal. The involvement of Vale of Glamorgan Council will ensure that wider considerations, such as those relating to Active Travel and the local highway network, form a key part of the proposals that are progressed.

7.4 Review Group

In line with WelTAG 2017, an independent Review Group has overseen and reviewed the WelTAG Stage Two appraisal output. A meeting of the Review Group was held on 24th September 2019 to review and challenge the contents of the WelTAG Stage Two Report. All the outcomes have been incorporated into the final version of this Report.

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Penarth to Cardiff Barrage Sustainable Transport Corridor Study

WelTAG Stage Two - Draft Impact Assessment Report

October 2019

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Penarth to Cardiff Barrage Sustainable Transport Corridor Study
WelTAG Stage Two - Draft Impact Assessment Report

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Contents

Appendices

1. Introduction

In line with WelTAG 2017 guidance, detailed evidence, data and analysis underlying the statements made in the WelTAG Stage Reports, are presented in a separate document known as the WelTAG Impact Assessment Report (IAR).

This IAR for the Penarth Cardiff Barrage Sustainable Transport Corridor Study WelTAG Stage Two – Draft Report, gathers together all the evidence that has been used to support the further appraisal undertaken on the short list of options.

Evidence to support the WelTAG Stage One appraisal process was presented within the Impact Assessment Report that accompanies the WelTAG Stage One Report.

As future stages of the WelTAG process are undertaken, more evidence will be produced, and additional sections will be added to this IAR.

The contents of this WelTAG Stage Two IAR are described in the following chapter of this report.

2. Stage Two: Outline Business Case

This Impact Assessment Report (IAR) contains the following information to support the appraisal undertaken at Stage Two of the WelTAG process (Outline Business Case).

This information is presented in the following Appendices:

- Appendix 1 – Penarth Cardiff Barrage Sustainable Transport Corridor Study, WelTAG Stage 1 – Final Report, May 2019
  A copy of the WelTAG Stage One report is included as Appendix 1.

- Appendix 2 – WelTAG Stage Two Appraisal Methodology Note
  This note outlines the methodology used for the appraisal of the shortlisted options at WelTAG Stage Two.

- Appendix 3 – Well-being of Future Generations (Wales) Act 2015 – Application of the Five Ways of Working
  This provides a summary of how the five ways of working have been considered and applied throughout WelTAG Stages One and Two.

- Appendix 4 – Local Authority Population Projections for Wales to 2039
  This presents the population projections by local authority and region in Wales until 2039.

- Appendix 5 – Active Travel Integrated Network Maps for Penarth
  As part of the Active Travel (Wales) Act 2013 local authorities across Wales were required to map existing and future walking and cycling routes in designated settlements across Wales. The Vale of Glamorgan's INM for Penarth is shown in Appendix 5.

- Appendix 6 – Key Trip Attractors
  The map in Appendix 6 shows the location of key trip attractors within the WelTAG Stage Two study area.

- Appendix 7 – Penarth Headland Link – Existing Studies
  A list of the PHL studies that have been completed to date is included in Appendix 7, along with extracts from existing PHL studies.

- Appendix 8 – Active Travel Review of Proposed Routes
  This presents the findings of a desktop review of the Active Travel routes proposed in Option 1, which highlights the problems and issues experienced by users of active modes, potential Active Travel improvements and deliverability considerations.

- Appendix 9 – Summary of Proposed Active Travel Improvements
  Appendix 9 is a summary of the Active Travel measures proposed along each route within Option 1.

- Appendix 10 – Plan of Potential Bike Hire Locations in Penarth
  The plan in Appendix 10 shows the potential bike hire locations being proposed by Vale of Glamorgan Council.

- Appendix 11 – Review of Cosmeston Park and Ride Sites
  This presents the findings of a desktop review of three potential sites for the Park and Ride facility at Cosmeston Lakes Country Park.

- Appendix 12 – Review of Bus Priority Routes
  This presents the findings of a desktop review of three potential routes for the proposed bus route between Cosmeston Park and Ride and Cardiff Barrage.

- Appendix 13 – Introduction of Buses on Cardiff Barrage – Existing Studies
  A list of the studies that have been completed to date in relation to the introduction of buses on Cardiff Barrage is included in Appendix 13, along with extracts from an existing study.

- Appendix 14 – Transport for Wales – Planned Future Works
  This provides an outline of planned future work to be undertaken by Transport for Wales in the WelTAG Stage Two study area.

- Appendix 15 – Penarth Ecology Overview
  This presents the findings of an initial desktop overview of ecological considerations across the WelTAG Stage Two study area.

- Appendix 16 – Review of Environmental Considerations
  This presents the findings of an initial desktop overview of environmental considerations for each shortlisted option.

- Appendix 17 – Penarth Cardiff Barrage Sustainable Transport Corridor – Stage 2 Consultation Report – Draft
  The Consultation Report provides a detailed account of the consultation activities that have been undertaken at WelTAG Stage Two and the results of the consultation.

- Appendix 18 – WelTAG Stage Two Option Appraisal Tables
  Appendix 18 presents a detailed record of the WelTAG Stage Two Strategic Case appraisal of options i.e. Worksheets 5 – 9 and 11. Worksheet 12 presents a summary of the results of the appraisal, which is also included in Section 2.9 of the WelTAG Stage Two report. Worksheet 10 presents a summary of the results of the qualitative Transport Case appraisal, which is also included in Section 3.4 of the WelTAG Stage Two report.

  Worksheets 1 – 4b from the WelTAG Stage One report are also included within this Appendix for reference (these worksheets refer to previous options not taken forwards to WelTAG Stage Two).

- Appendix 19 – Well-being Assessment Tables
  This presents a well-being assessment of each shortlisted option against the goals of the Well-being of Future Generations (Wales) Act 2015 Act, the Welsh Government's well-being objectives and the well-being objectives of the Vale of Glamorgan Council and the Vale of Glamorgan's Public Services Board.

- Appendix 20 – Preliminary Cost Estimates Developed to Support WelTAG Stage Two
  This provides a summary of the preliminary capital cost estimates that have been developed for the WelTAG Stage Two report.

- Appendix 21 – WebTAG Appraisal Sheets
  Appendix 21 presents the appraisal tables that support the Transport Case economic assessment.

- Appendix 22 – Transport Case – Impact Assessment Tables
  These tables provide the justification and detail to support the Transport Case qualitative appraisal of each shortlisted option against a range of economic, environmental, social and cultural factors.

Appendix 1 Penarth Cardiff Barrage Sustainable Transport Corridor Study, WelTAG Stage One – Final Report (May 2019)

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Penarth Cardiff Barrage Sustainable Transport Corridor Study

WelTAG Stage 1 - Final Report

May 2019

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Penarth Cardiff Barrage Sustainable Transport Corridor Study
WelTAG Stage 1 - Final Report

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Glossary of Terms

AQMA	Air Quality Management Area
BCR	Benefit – Cost Ratio
GRIP	Governance for Railway Investment Projects
HR	Human Resources
IAR	Impact Assessment Report
INM	Integrated Network Map
LDP	Local Development Plan
NYA	Not Yet Assessed
TUPE	Transfer of Undertakings (Protection of Employment)
WBOFGA	Well-Being of Future Generations Act
WelTAG	Welsh Transport Appraisal Guidance

Contents

Supporting Information

1. Introduction

1.1 Background and Study Context

The need to consider options for improving connectivity by sustainable transport along the Penarth Cardiff Barrage Corridor has been identified by the Vale of Glamorgan's Local Development Plan (LDP) (2017), which includes a policy to deliver sustainable transport improvements along the corridor between Penarth and Cardiff. The LDP also sets an objective that Penarth be promoted as a 'sustainable transport town' by implementing measures that improve connectivity within the town and 'to adjoining residential and commercial areas, including Cardiff Bay'.

The proximity of Penarth to Cardiff presents both challenges and opportunities in terms of connectivity and accessibility. The Vale of Glamorgan Public Service Board Well-being Assessment 2017 states that the 'Vale's location could be considered one of its greatest assets in maximising the economic well-being of our residents and the area' and the LDP highlights the proximity to Cardiff as a key factor in terms of employment. However, the location of the Vale is also a key factor in the area having the highest rate of out-commuting in Wales, the majority of which is commuting into Cardiff. These high levels of out commuting result in peak time congestion on the main distributor roads in the eastern Vale of Glamorgan, which has a negative impact on existing sustainable transport options for everyday journeys.

It is important to consider sustainable transport options to improve connectivity along the Penarth Cardiff Barrage Corridor to ensure the opportunities offered by Penarth's proximity to Cardiff are maximised. As stated in the Well-being Assessment 2017, 'Sustainable transport infrastructure and services can contribute to reducing negative impacts that cars have on the environment, reducing congestion, improving health and wellbeing, improving access to employment, health and education and other facilities and reducing the risk of road accidents.'

This WelTAG Stage 1 has been commissioned to strategically identify, develop and appraise sustainable transport projects along the corridor linking Cardiff and Penarth.

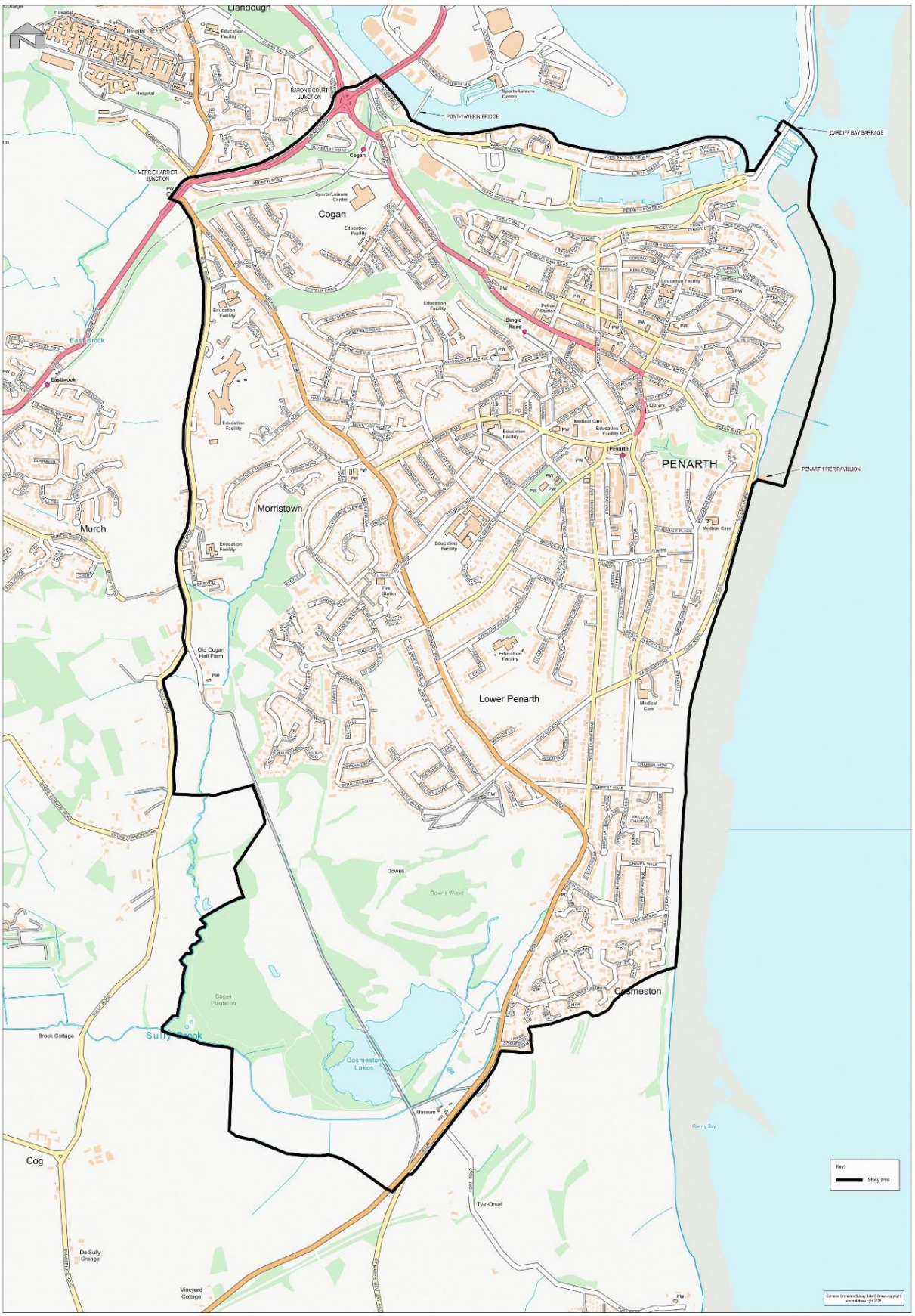
1.2 Purpose of the Study

Capita has been commissioned by the Vale of Glamorgan Council to develop and appraise sustainable transport options for the Penarth Cardiff Barrage Sustainable Transport Corridor. The appraisal of options has been undertaken in line with the Welsh Transport Appraisal Guidance (WelTAG 2017). The principles behind the Well-being of Future Generations (Wales) Act 2015 are embedded within the WelTAG process and have been an integral part of the development and appraisal of the options considered by this study. This report presents the Stage 1: Strategic Outline Case of the WelTAG process. In addition to the detail provided in this report, an accompanying Impact Assessment Report (IAR) provides a record of the detailed evidence and analysis that supports this WelTAG Stage 1 report.

1.3 The Study Area

A plan of the study area is included as Figure 1.1 below. The study area encompasses the town of Penarth, including the residential areas of Penarth Marina to the north, Cogan and Morristown to the east and Cosmeston to the south. Two key junctions on the A4055 highway network (Merrie Harrier Junction and Baron's Court Junction) define the northern boundary of the study area. Three train stations are located within the study area, namely Penarth, Dingle Road and Cogan. A summary of the current sustainable transport provision in the Penarth area, including bus and rail services and active travel infrastructure, is included in Appendix 1 of the IAR. Cardiff Barrage is included within the study area (despite being outside the Vale of Glamorgan local authority area) due to the importance of the link in considering sustainable transport options into Cardiff.

Figure 1.1 Penarth Cardiff Barrage Sustainable Transport Corridor Study Area



1.4 WelTAG 2017 (Stage One: Strategic Outline Case)

In 2017, the Welsh Government issued updated Welsh Transport Appraisal Guidance, which is used to appraise all transport schemes in Wales. The original guidance was issued in 2008.

The Guidance has been used to appraise options developed as part of this Penarth Cardiff Barrage Sustainable Transport Corridor Study to ensure that:

- As part of the Strategic Outline Case (WelTAG Stage 1), the appraisal process to produce a long list of options is compliant within current guidance; and
- An 'evidence' led approach has been adopted in selecting a short-list of options for consideration at the Outline Business Case (WelTAG Stage 2).

Throughout the WelTAG process, appraisal is based on the Five Cases approach, which is used by the Welsh Government and HM Treasury in business cases for projects requiring public sector funding.

The Five Cases are as follows:

- The Strategic Case;
- The Transport / Economic Case;
- The Financial Case;
- The Commercial Case; and
- The Management Case.

The level of detail that is contained within each Case is dependent upon the WelTAG stage that is being undertaken. At the Strategic Outline Case (WelTAG Stage 1), which is the subject of this report, the Strategic Case has been fully developed and the Transport Case is an initial assessment only. The other Cases are in preliminary form only and would be developed further at later stages in the WelTAG process.

At Stage 1 of the WelTAG process the purpose is to understand the issues of concern, explore the context and to present a wide list of possible solutions. These should be sufficient to be able to decide whether there are any solutions within the transport sector that are worth pursing and to select a short list of options for more detailed consideration. At Stage 2 further investigation is undertaken into the shortlisted options.

Each of the long list of options as part of this Stage 1 appraisal has been assessed in terms of impact, using the following 7 point likert scale:

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large Negative (- - -)

A statement outlining the methodology for undertaking scheme appraisal is included in Appendix 2 of the IAR.

1.5 Report Structure

This report is structured as follows:

- Chapter 2 – This chapter provides the Strategic Case. It outlines the case for change, clearly demonstrating a need for intervention and the problems and issues within the study and wider area. The chapter highlights the strategic fit both locally, regionally and nationally of the options developed. A summary of the output of the stakeholder consultation undertaken to investigate problems within the study area, the development of objectives and long list of options is also provided;
- Chapter 3 – This chapter provides the Transport Case. It outlines the results of the qualitative assessment undertaken into the economic, environmental, social and cultural impacts of the long list of options appraised;
- Chapter 4 – This chapter provides the Financial Case. This chapter discusses some of the capital and revenue costs that may be associated with the long list options, as well as highlighting the potential funding sources that may be available to undertake development work and implementation of a final preferred option;
- Chapter 5 – This chapter provides the Commercial Case. This provides a summary of the aspects that will need to be considered in procuring any future options for implementation;
- Chapter 6 – This chapter provides the Management Case. Details are provided of the governance arrangements and potential statutory procedures that may be involved in scheme delivery. An assessment of the deliverability of each of the long list of options is provided; and
- Chapter 7 – This chapter provides a summary and conclusion to the report, recommending the short list of options to be taken forward for further WelTAG assessment. A summary of the future work that may be required to undertake further assessment is also provided.

2. Strategic Case

2.1 Overview

As detailed in WelTAG 2017, the strategic case:

- Presents an evidence-based description of the current situation and the issue that needs addressing, describes the likely future situation if no action is taken and presents the reasons why an intervention is required;
- Involves an analysis of the factors that are contributing to the identified problem, as this will assist in the development of possible solutions;
- Establishes objectives against which the proposed solutions will be judged; and
- Sets out a narrative as to how each of the proposed solutions is intended to change the situation.

2.2 Consultation

The development of the Strategic Case has been informed by two WelTAG consultation events that took place in Penarth in January 2019. Firstly, a stakeholder workshop and secondly, a public consultation event. Both were used to identify the current problems and constraints within the study area and to identify potential solutions to these problems. The seven well-being goals of the Well-Being of Future Generations (Wales) Act 2015 were considered when identifying potential solutions at both workshops.

The WelTAG consultation report detailing the comments received at both consultation events is included in Appendix 3 of the IAR. The outputs from both the stakeholder and public consultation events helped to inform the Strategic Case, including the identification of problems, the development of study-specific objectives and the development of a list of potential options to address the problems. These are discussed further in Sections 2.5, 2.6 and 2.7.

2.3 Policy Context

A policy review has been undertaken to inform the development of this WelTAG Stage 1 report and is included in Appendix 4 of the IAR. The national, regional and local policy documents reviewed in relation to this study are as follows:

- National Policy
  - Prosperity for All: The National Strategy (2017)
  - Prosperity for All: Economic Action Plan (2018)
  - Emerging Wales Transport Strategy
  - One Wales: Connecting the Nation (Wales Transport Strategy, 2008)
  - National Development Framework (anticipated publication – 2020)
  - Wales Spatial Plan (2008)
  - National Transport Plan (2010, updated 2011)
  - National Transport Finance Plan (updated 2017)
  - Planning Policy Wales (Edition 10, 2018)
  - Active Travel (Wales) Act 2013
  - Well-being of Future Generations (Wales) Act 2015

- Regional Policy
  - Cardiff Capital Region Regeneration Plan 2018-2021

- Local Policy
  - Vale of Glamorgan Public Services Board Well-being Plan 2018-2023: Our Vale – Our Future;
  - Vale of Glamorgan Council Well-being Objectives and Improvement Plan (2018);
  - Vale of Glamorgan Local Development Plan (2017);
  - Vale of Glamorgan Local Transport Plan; and
  - Penarth Town Place Plan.

The policy review outlines the key themes and objectives of the above policy documents and details how these would be supported by sustainable transport improvements within the study area. For example, at the national level, sustainable transport interventions would support the economic objectives of the Prosperity for All: Economic Action Plan (2018), National Development Framework and the National Transport Finance Plan. Improvements to sustainable transport within the study area would support the sustainable transport objectives of the Wales Transport Strategy, the National Development Framework, the National Transport Plan and the Active Travel (Wales) Act 2013. At a regional level, improvements in sustainable and active travel provision within the study area will contribute towards the Cardiff Capital Region objectives and would more locally contribute towards the goals and objectives of key policy documents such as the Local Development Plan and Local Transport Plan. The objectives of a number of these national, regional and local policy documents are considered further as part of the Strategic Case assessment, as detailed in Section 2.8 of this report.

The policy review has considered both national and local well-being plans and objectives, through a review of the Well-being of Future Generations (Wales) Act 2015 and local well-being plans. The policy review includes a summary of how sustainable transport improvements in the Penarth Cardiff Barrage Corridor would support the five ways of working of the Act i.e. Long Term, Prevention, Integration, Collaboration and Involvement. The Well-being of Future Generations (Wales) Act 2015 has been fundamental throughout the development of the Strategic Case. The well-being goals and five ways of working have been integral to the identification of problems (as detailed in Section 2.5), the development of study-specific objectives (as detailed in Section 2.6) and the assessment of potential options (as detailed in Section 2.8).

2.4 The Case for Change

There is evidence of high levels of car use for everyday journeys along the Penarth to Cardiff Barrage corridor, which results in a range of negative impacts for local communities. High levels of car use results in problems of traffic congestion and delays, not only on key routes, but also on more local roads and within Penarth town centre.

A previous study by Arup (2018)[1] undertook a review of Census data in relation to journey to work patterns. (A summary of the background studies referred to in this section are included within Appendix 5 of the IAR). The study has shown that 63% travel to work by car or van which, although lower than the Wales average of 71%, is by far the dominant mode of travel to work. This is combined with the area having the highest rate of out-commuting in Wales, the majority of which is commuting into Cardiff. The proportion of car use for travel to work journeys, combined with the high levels of commuting to Cardiff, has a large impact on key highway junctions and corridors linking Penarth and Cardiff. The Vale of Glamorgan's LDP identifies the 'high levels of out commuting for work resulting in peak time congestion on the main distributor roads in the eastern Vale of Glamorgan'.

The study[1] found that 3.1% travel to work by bus, which is lower than the Wales average of 4.9%. The low level of travel by bus is in part due to the available travel options by bus not presenting an attractive alternative to travel by car for everyday journeys. For example, traffic congestion at

[1] Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup, October 2018

key junctions results in delays to both private vehicles and to public transport for those using the key routes between Penarth and Cardiff. The current route for buses travelling from Penarth to Cardiff is via heavily trafficked roads with no bus priority measures in place. Buses are subject to the same delays as private vehicles and journeys by bus take longer than the equivalent journey by car. The unreliability and slow journey times of bus services reduces the attractiveness of travel by bus as an alternative to the car, particularly for commuting journeys.

The study[1] found that levels of travel to work by train, walking and cycling are all higher than the Wales average. Travel to work by train is almost 12%, which is significantly higher than the Wales average of 2% and reflects the good accessibility to the rail network for Penarth residents. Travel to work by bike is 3.7%, which is more than double the Wales average of 1.5%, and 12.6% walk to work, which is higher than the Wales average of 11.2%. These figures present a promising baseline on which to further increase levels of sustainable and active travel. However, although these figures are currently higher than the Wales average, factors such as the proximity of Penarth to Cardiff and the high levels of out-commuting to Cardiff, offer the potential to further increase the proportion of journeys by sustainable modes. The provision of dedicated sustainable transport infrastructure along the Penarth Cardiff Barrage Corridor would increase the attractiveness of the options for travel by sustainable modes.

High traffic levels and congestion also impact upon emissions levels and air quality. The Vale of Glamorgan Public Services Board's Well-being Assessment 2017 provided evidence from the physical environment domain of the Welsh Index of Multiple Deprivation 2014. This used a '2012 Air Concentrations Indicator which on a scale of 1 to 100 (100 being more polluted) ranged from over 80 in some parts of Penarth and Llandough in the Eastern Vale to under 25 in parts of Llantwit Major and St. Bride's Major in the Western Vale.' In addition, there have been more concentrated problems of poor air quality, with a defined area on Windsor Road, Cogan being previously designated as an Air Quality Management Area (AQMA). Measures to reduce levels of car use and increase levels of sustainable and active travel will have a positive impact on emissions and air quality.

In addition to commuting journeys, there is the potential to increase travel by sustainable and active modes for other 'everyday journeys', such as to services and facilities within Penarth town centre. High traffic levels and problems of congestion within Penarth town centre have a negative impact on the town centre environment and reduce the attractiveness of the town centre to pedestrians and cyclists. The impact of traffic along with a lack of joined-up and good quality infrastructure for pedestrians and cyclists leads to safety concerns by more vulnerable users. As stated by the Vale of Glamorgan Public Services Board's Well-being Assessment 2017 'thriving Town Centres are an important part of promoting all aspects of well-being in the Vale.' The LDP contains an objective for Penarth to 'strengthen links between Penarth Marina, the Esplanade and the town centre' through e.g. effective traffic management schemes and appropriate infrastructure improvements.

Measures to improve connectivity and accessibility to key services and facilities would have economic, social and environmental benefits for Penarth town centre and its surrounding communities. This includes the potential benefits that improvements in connectivity and accessibility would have to the Penarth leisure and tourism market. Improvements to sustainable transport linkages along the Penarth Cardiff Barrage Corridor would enable Penarth to attract a greater number of the leisure and tourism visitors from which the Cardiff Barrage and Cardiff Bay currently benefit. A previous study by Arup (2015)[2] included a review of Cardiff Harbour Authority pedestrian survey data that was collected on Cardiff Barrage throughout 2014. During 2014, a total of 644,771 pedestrians were recorded using the barrage and the surveys recorded a Sunday footfall peak of around 400 pedestrians per hour. The implementation of sustainable transport improvements along the Penarth Cardiff Barrage Corridor have the potential to expand the popularity of the barrage, and its associated benefits, to the wider area. The pedestrian data also highlights the fluctuations in pedestrian numbers on the barrage throughout the year and that usage of the barrage increases during the Spring and Summer months. This reflects the impact that environmental and seasonal factors can have on levels of walking and cycling.

[2] Cardiff Bay Barrage Transport Link, Arup, October 2015

The full detail of the problems identified to support the case for change are detailed in Section 2.5 below. The identification of problems has been informed by the seven goals of the Well-being of Future Generations (Wales) Act 2015.

If no action is taken, levels of car use are likely to increase, and the associated negative economic, social and environmental impacts of traffic delays and congestion are likely to worsen. The negative impacts of traffic volumes on the attractiveness of existing sustainable travel options are likely to increase. Journey time delays for buses are likely to worsen and traffic volumes are likely to have an increasing negative impact on Penarth town centre and reduce its attractiveness as a destination for journeys by active travel modes.

2.5 Identification of Problems

The first step in the WelTAG Stage 1 process was the identification of the problems that need to be addressed along the Penarth Cardiff Barrage Corridor. The WelTAG stakeholder and public consultation events required those attending to consider and identify problems affecting the study area. The results of the consultation events, along with information gathered from previous studies and existing policy documents, such as the Vale of Glamorgan Local Development Plan, enabled a list of the key problems to be developed. The 14 problems that have been identified are detailed in Table 2.1, which is also included in Appendix 6 (Worksheet 1) of the IAR. A summary of the background studies referenced in the tables in this report are included within Appendix 5 of the IAR. The well-being goals and objectives of the Well-being of Future Generations (Wales) Act 2015 formed a key part of developing the strategic case and the table below shows how each identified problem impacts directly on achieving the well-being goals.

Table 2.1 – Identified Problems and Links to the Goals of the Wellbeing of Future Generations (Wales) Act 2015

Well-being Goal Being Hindered	Ref	Description	Evidence
A Prosperous Wales	1	Existing volumes of traffic and levels of congestion causes pollution and creates unreliable journey times and delays to private and business vehicles and bus services, particularly during peak periods. A study by Arup (2018) has highlighted that traffic congestion and delay is a significant issue along the B4267 Lavernock Road/ Redlands Road (between Cosmeston and Cogan), along the A4160 Windsor Road (between Penarth and Cogan) and on the A4055 around the Merrie Harrier junction. This is particularly the case during the AM peak when with average speeds are often 10mph or lower. The WelTAG consultation highlighted congestion problems on routes between Penarth and Cardiff, e.g. along Windsor Road, Windsor Road/ Plassey Street and in Penarth town centre. Reference was also made to congestion at Penarth Marina due to 'rat-running'.	Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); WelTAG consultation events (Jan 2019)
	4	Sustainable transport options available do not present an attractive alternative to car travel e.g. key destinations are not easily accessible by sustainable transport modes, bus accessibility and provision is viewed as poor, rail service viewed as unreliable, expensive and requiring more capacity, lack of reliable boat service throughout the year.	WelTAG consultation events (Jan 2019)
	6	A lack of park and ride facilities in the area limits the opportunities for interchange between car and public transport, which reduces the attractiveness of public transport travel options. Park and ride provision at rail stations in the study area (Penarth, Dingle Road and Cogan) is very limited with less than 25 parking spaces available at both Penarth and Cogan and no parking available at Dingle Road. There are no bus park and ride facilities available in the study area.	Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); WelTAG consultation events (Jan 2019)

Well-being Goal Being Hindered	Ref	Description	Evidence
 A Resilient Wales	3	High levels of car use and low levels of public transport usage and active travel, particularly for commuting journeys. The close proximity of Penarth to Cardiff results in high levels of commuting into Cardiff. Figures for the Vale of Glamorgan as a whole show that 52.2% of working residents commute out of the county borough to work with the majority of these (21,600) commuting to Cardiff. A study by Arup (2018) has highlighted that a significant proportion of those working in Cardiff commute to work by private car (66.7%) and only 12.5% commute by public transport (bus and rail). There are high levels of commuting by car transport into Cardiff due to a lack of convenient and attractive alternatives by sustainable modes and this puts pressure on the local highway network and routes into Cardiff.	StatsWales Commuting Patterns in Wales 2017; Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018)
 A More Equal Wales	5	Bus services linking Penarth and Cardiff have slow journey times and are unreliable due to congestion problems along the bus corridors. The available bus route options often require interchange at Cardiff Bay. A study by Arup (2018) has found that bus services take between 50% and 80% longer than travelling by car, with congestion problems in Cardiff being a key factor in the length of journey times. The significantly longer journey times reduce the attractiveness of bus travel, particularly for those commuting into Cardiff.	WelTAG consultation events (Jan 2019); Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018)
 A Healthier Wales	7	There are currently low levels of active travel for everyday journeys, which needs to be increased if the long-term health benefits of active travel are to be realised. The WelTAG consultation noted that too many short distance trips are undertaken by car. A study by Arup (2018) found that 12.6% of Penarth residents walk to work and 3.7% commute by bike. Both figures are higher than the Wales average but have potential to be increased further due to the proximity of Penarth to Cardiff and the high levels of commuting into Cardiff.	WelTAG consultation events (Jan 2019); Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018)
	11	Environmental factors reduce the attractiveness of walking and cycling e.g. the exposed nature of the most direct active travel route into Cardiff (across Cardiff Barrage) may discourage use of the route during bad weather, coastal erosion, risk of rockfall and bad weather conditions (storms/ high tides) along the coastline.	WelTAG consultation events (Jan 2019)

Well-being Goal Being Hindered	Ref	Description	Evidence
 A Wales of Cohesive Communities	8	Safety issues act as a barrier to walking and cycling and the constrained nature of the built environment e.g. narrow roads and congestion at junctions, creates conflicts between motor vehicles, pedestrians and cyclists. Specific locations highlighted during the WelTAG consultation include: - lack of safe cycle routes along Windsor Road and Penarth Road; - Arcot Street/ Windsor Road junction being dangerous for cyclists; - footways in Penarth being dangerous for those with disabilities; - the need for safe pedestrian crossing facilities at Plassey Street/ Windsor Road; - a lack of safe pedestrian crossing facilities at Cogan (Windsor Road/ A4160 adjacent to railway station); - the hill from Cardiff Barrage into Penarth being dangerous for cyclists and the footway being unsuitable for pedestrians.	WelTAG consultation events (Jan 2019)
	9	A lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes within Penarth and between Penarth and Cardiff creates a poor quality environment for walking and cycling and acts as a barrier to encouraging active travel. Specific issues highlighted during the WelTAG consultation include: - the existing route connecting Penarth seafront to Cardiff Barrage being challenging and unsuitable for pedestrians and those with mobility problems; - need a link to Cardiff Bay that avoids busy junctions; - need to improve pedestrian and cycling access to Cogan and Penarth stations; - no route from Cardiff Barrage to bottom of 'zig-zag' path; - poor connectivity from Llandough Hospital and Merrie Harrier to Penarth; - lack of lighting along existing active travel routes.	WelTAG consultation events (Jan 2019); Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018)
	10	A lack of facilities for cyclists at trip origin and destination discourages the use of active travel e.g. no current opportunities to hire bikes, lack of showers and bike storage at employment sites.	WelTAG consultation events (Jan 2019)
	12	The topography of the area acts as a barrier to active travel and creates difficulties in providing active travel infrastructure e.g. gradient from Cardiff Barrage to Penarth town centre.	WelTAG consultation events (Jan 2019)

Well-being Goal Being Hindered	Ref	Description	Evidence
 A Wales of Vibrant Culture and Thriving Welsh Language	14	Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the Penarth economy e.g. there is a need for improved links to Cardiff Bay and the Penarth end of Cardiff Barrage lacks a 'destination'. The operational barrage also impacts on connectivity and creates conflict between pedestrians and cyclists using Cardiff Barrage and Pont y Werin.	WelTAG consultation events (Jan 2019)
 A Globally Responsible Wales	2	The high volume of traffic acts as a barrier to walking and cycling and to increasing levels of active travel. The WelTAG consultation highlighted the volume of traffic on Windsor Road and Hickman Road as being a barrier to walking and cycling, along with the speed of traffic along Windsor Road.	WelTAG consultation events (Jan 2019)
	13	Road traffic emissions and congestion contribute to reduced air quality in some areas and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	Vale of Glamorgan Council 2018 Air Quality Annual Progress Report (Aug 2018)

2.6 Objectives for the Study Area

The objectives for the WelTAG Stage 1 appraisal were developed through the WelTAG consultation events, a review of previous studies and consideration of the identified problems. The consultation events with stakeholders and the public were used to identify a potential long list of objectives, which is detailed in Appendix 6 (Worksheet 2) of the IAR. Each potential objective was assessed in terms of its ability to address the identified problems and to contribute to each of the well-being goals of the Well-being of Future Generations (Wales) Act 2015. This assessment enabled the long list of objectives to be refined and combined to produce a more succinct list of five SMART objectives.

The five objectives have been further assessed in terms of their potential to have a positive impact on each of the identified problems and their potential to work towards each of the national well-being goals. The assessment has also considered how each objective contributes to the five ways of working as set down in the Well-being of Future Generations (Wales) Act 2015. This assessment is included in Appendix 6 (Worksheet 3) of the IAR. The five objectives have been agreed with the Vale of Glamorgan Council and are the objectives against which each of the proposed options/ solutions have been appraised.

The five objectives that will form the basis for this WelTAG are as follows:

1. Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel;
2. Reduce barriers that constrain opportunities to increase travel by sustainable transport modes;
3. Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being;
4. Deliver sustainable transport improvements that encourage increased economic activity and support long term investment; and
5. Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.

2.7 Option Development

The WelTAG Stage 1 process requires the identification of options to address the identified problems and achieve the agreed objectives. The WelTAG stakeholder and public consultation events required those attending to consider solutions/ options to address the problems that had been identified. A list of 17 potential options for consideration was compiled through a review of the information gathered from the WelTAG consultation events and of previous studies relating to the study area. This list of 17 potential options is included within Appendix 6 (Worksheet 4a) of the IAR.

The potential list of options was discussed at a stakeholder meeting and packaged together into appropriate themes to produce a final long list of five options for assessment during the WelTAG Stage 1 process. The final long list of options assessed was agreed with the Vale of Glamorgan Council. Table 2.2 details the list of options that were assessed during the WelTAG Stage 1 appraisal and this information is also included in Appendix 6 (Worksheet 4b) of the IAR. A summary of the background studies referenced in the table below are included within Appendix 5 of the IAR.

Table 2.2 – Option Development – Agreed Long List of Options

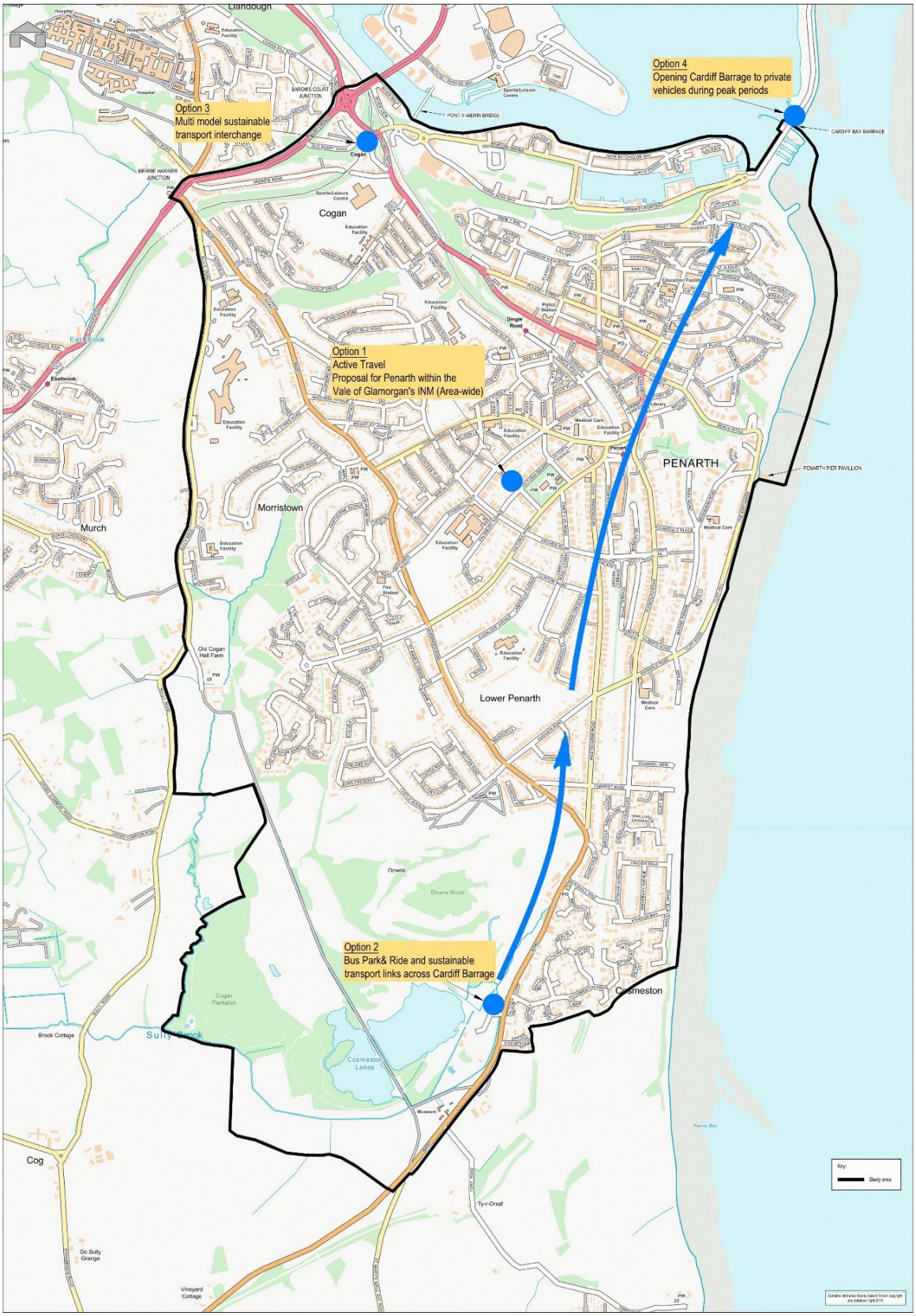
Ref	Option Title	Description
1	Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM	This option involves delivering the proposals within the Vale of Glamorgan's Active Travel Integrated Network Map (INM).The lack of a joined-up network of active travel links within Penarth and to the wider active travel network, e.g. to Cardiff, along with the congested nature of the highway network, limits the potential of active travel as an option for everyday journeys. The provision of new active travel infrastructure would encourage greater levels of walking and cycling and improve links between key services. The delivery of the active travel proposals within the Vale of Glamorgan's Active Travel INM would improve connectivity and the attractiveness of active travel between key origins and destinations within Penarth and to the wider area. The INM proposals in the Penarth area include a programme of schemes, which are highlighted as having a 'predictive delivery' timescale of 0-5 years (short term schemes), 5-10 years (medium terms schemes) and 10-15 years (long term schemes). The proposals include two active travel schemes that have been considered by previous feasibility studies: - Penarth Headland Link – Construction of a shared-use pedestrian and cycle route to improve connectivity between Penarth and Cardiff Bay. The 1.1km route would run from the western end of Cardiff Barrage to Penarth Pier and would extend the existing Wales Coastal Path. Identified in the INM as a long-term proposal. Previous studies that have considered the feasibility and economic case for the proposal include those by the Penarth Headland Link Group (2017), Sustrans (2018), Arup (Apr 2018) and Arup (Oct 2018). - Merrie Harrier to Pont y Werin and Penarth Road – Identified in the INM as a medium-term proposal. A previous feasibility study by Capita (2016) considered this route and proposed a number of cycle and pedestrian infrastructure measures. In addition to the delivery of the INM this option includes consideration of the following area-wide measures: - Measures to improve existing active travel and highway infrastructure for pedestrians and cyclists can encourage greater levels of active travel e.g. by improving the safety and security of routes for more vulnerable users. Such proposals include the lighting of active travel infrastructure to increase the attractiveness of routes at all times of the day/ year and speed reduction measures on the highway network, such as the introduction of 20mph zones or shared spaces, to create a more attractive active travel environment. - Improved facilities at employment sites and other destinations, e.g. the provision of secure bike storage, pool bikes and employer incentives, can also increase the attractiveness of active travel as a realistic everyday travel option. - The success of the 'Next Bike' bike hire scheme in Cardiff and the potential of expanding the scheme to Penarth also offers potential for increasing levels of active travel by removing constraints to travelling by bike for short journeys. - Softer measures such as the introduction of school travel plans and walking buses at schools can also encourage greater levels of active travel for school journeys. It should be noted that a number of these measures, e.g. the provision of facilities at employment sites, expanding the bike hire scheme and walking buses, are reliant on implementation by a third party. NB. The following additional improvements in Penarth were suggested through the WelTAG consultation that are not currently included in the Active Travel INM: Reopening the tunnel below the A4160 Windsor Road to Cogan Station; Pedestrian link between Tennyson Drive and Cowslip Drive; Pedestrian link between Fairfield Road and Gainsborough Road; Continuation of Railway Walk for walking and cycling. Suggestions for additional active travel improvements would initially need to be considered as part of any future review of the INM and will not be considered by this WelTAG study.

Ref	Option Title	Description
2	Bus park and ride and sustainable transport links across Cardiff Barrage	This option involves providing attractive and convenient sustainable transport options for the journey between Penarth and Cardiff through the implementation of a bus park and ride scheme, associated bus priority measures and sustainable transport provision across Cardiff Barrage into Cardiff. The current route for buses travelling from Penarth to Cardiff is via heavily trafficked roads with no bus priority measures in place. Buses are subject to the same delays as private vehicles and journeys by bus take longer than the equivalent journey by car. The unreliability and slow journey times of bus services due to traffic delays reduces the attractiveness of travel by bus as an alternative to the car, particularly for commuting journeys. There are currently no park and ride facilities available for those living within the Cosmeston/ Sully area and options for rail park and ride in Penarth area generally are limited. The provision of a bus park and ride facility at Cosmeston would aim to remove car trips from the highway network in and around Penarth, reduce congestion along key routes and increase sustainable travel options for commuting journeys into Cardiff. Land at Cosmeston has been identified within the Vale of Glamorgan's Local Development Plan as being suitable to accommodate a large surface car park. The site currently comprises a car park with a gravel surface and has good access to the adjacent B4267 with access to the car park via a priority junction. Delivery of the scheme would need to be supported by bus priority measures on the bus route to and from the park and ride facility to ensure the bus journey time for those using the park and ride presents an attractive alternative to the journey by private car. The bus priority measures between Cosmeston and Cardiff Barrage could include improvements at key junctions and optimisation of traffic signals to reduce bus journey times. Measures could include local widening, lane reallocation, junction upgrades at pinch points and would potentially require land acquisition. The scheme would also include improvements to bus stops along the route. The Vale of Glamorgan's Local Development Plan includes a policy to provide bus priority measures along Lavernock Road to Cardiff via Cardiff Barrage. More recently a study by Arup (2018) undertook a feasibility appraisal of four potential alignments for the bus priority scheme between Cosmeston and Cardiff Barrage. The 'emerging preferred sub-option' from the feasibility assessment involves a range of bus measures along Westbourne Road, the A4160 Stanwell Road, Clive Place and Paget Terrace/ Road which subsequently provides access to Cardiff Barrage. At Cardiff Barrage this option involves the introduction of sustainable transport options for travel into Cardiff via Cardiff Barrage, which would significantly improve access from Penarth and Penarth Marina. A number of innovative sustainable transport options for linking Penarth and Cardiff were suggested during the WelTAG consultation including water taxis, self-driving electric pods/ vehicles/ bikes, monorail or shuttle bus linking Penarth and Cardiff, powered uphill cycle lifts and a cable car. Consideration would need to be given to the infrastructure required to enable any sustainable transport option to travel the length of the barrage, as currently a significant section of the barrage is only accessible by pedestrians and cyclists. The existing active travel route along the barrage may require widening and land acquisition, with potential issues of conflict between the sustainable transport option and those walking and cycling being a key issue. Consideration would also need to be given to the operational nature of the barrage and the impact that water traffic crossing the barrage would have on timetabling and delays to any sustainable transport option. Issues regarding the introduction of buses onto the barrage have previously been considered in a report by Arup (2015). Associated measures to be considered as part of this option include: - bus service improvements, and - measures to improve interchange and connectivity between public transport/sustainable transport modes to simplify the user experience e.g. improved timetabling, enhanced information provision etc.

Ref	Option Title	Description
3	Multi-modal sustainable transport interchange	This option involves upgrading the existing railway station at Cogan to create a new multimodal transport interchange facility serving the Penarth Marina and Cardiff Bay areas. The current provision for park and ride at Cogan Station is limited, the station has poor quality pedestrian links to the surrounding area and the highway network in the vicinity of the station experiences problems of congestion. The option would deliver a mixed-use development that combines station enhancements, including an additional platform on the Penarth branch line, with residential and retail facilities. The study by Arup (2018) considered a number of sub-options for the station upgrade and provision of an expanded park and ride facility. The recommended sub-option includes the following elements: - A large park and ride facility (168 spaces) with improved facilities and road access located on a vacant site to the east of the study area; - Improvements to passenger facilities including a new station ticket hall, passenger waiting areas and customer toilets on the station platform; - Improved access on the A4160 Windsor Road and improvements to the road infrastructure including increased roundabout capacity; - Provision of bus and taxi interchange facilities to allow better links to Penarth Marina/ Cardiff Bay; - A new platform on the existing Penarth to Cardiff line; - A new 'access for all' footbridge to the main eastbound platform; - New residential development on the currently vacant site to the east. Suggestions were made during the WelTAG consultation for improvements to the highway network in the vicinity of Cogan Station e.g. replacement of Cogan roundabout with a traffic-signalled junction and provision of crossing facilities for pedestrians and cyclists. The WelTAG consultation also highlighted the need for improvements to the active travel environment and improved access for pedestrians and cyclists to Cogan Station. This option will also consider measures to improve interchange and connectivity between public transport/ sustainable transport modes to simplify the user experience e.g. improved timetabling, enhanced information provision, secure bike parking etc.
4	Opening Cardiff Barrage to private vehicles during peak periods	This option involves allowing Cardiff Barrage to be used by private vehicles during peak periods. The current route for all traffic travelling from Penarth to Cardiff is via heavily trafficked roads with high traffic volumes and problems of congestion. The route along Cardiff Barrage from Penarth to Cardiff Bay would be a significantly shorter and quicker route for those commuting from Penarth, especially for those working in and around Cardiff Bay. The scheme would allow private vehicles to travel the route of the Barrage during peak periods. As with Option 2, consideration would need to be given to the infrastructure required to enable vehicles to travel the length of the barrage, as currently a significant section of the barrage is only accessible by pedestrians and cyclists. The existing active travel route along the barrage may require widening and land acquisition, with the segregation of vehicles and those walking and cycling being a key issue.
5	Do Minimum	This option involves undertaking no investment in new transport infrastructure and no dedicated sustainable transport improvements in the area except from routine maintenance as and when required to keep routes operational.

A schematic plan showing the indicative location of each of the long list of options is included as Figure 2.1.

Figure 2.1- Study Area Plan of Options



2.8 Option Appraisal

An appraisal of each of the options has been completed using information that is currently available about each option. At WelTAG Stage 1, each option is at an early stage of development and this is reflected in the high-level and qualitative nature of the appraisal that has been undertaken.

The appraisal has involved each option being assessed against a range of factors using the WelTAG seven-point assessment scale, as set out in Section 1.4. A full record of the Strategic Case appraisal is included in Appendix 7 (Worksheets 5-9 and 11) of the IAR.

One element of the appraisal involved each option being assessed against the objectives of the following strategies and plans:

- Wales Transport Strategy;
- Well-being of Future Generations (Wales) Act 2015;
- Local well-being plans;
- Local Transport Plan; and
- Cardiff Capital Region.

The detailed results of the above assessment are included within Appendix 7 (Worksheets 5, 6 and 7) of the IAR.

Each option has also been assessed against each of the agreed study objectives of this WelTAG appraisal as detailed in Section 2.6 and each of the identified problems as detailed in Section 2.5. An early stage appraisal has also been undertaken of the deliverability of each option, which considers potential technical constraints and risks to delivery. The details of each of these assessments are included within Appendix 7 of the IAR (Worksheets 8, 9 and 11 respectively).

The following tables (Tables 2.3 – 2.7) provide a summary of the Strategic Case appraisal of each of the options and summarises the more detailed assessment that is recorded in Appendix 7 (Worksheets 5-9 and 11) of the IAR. The tables provide a summary description of each option, with the full description of each option being included in Table 2.2.

Table 2.3 - Option 1 – Strategic Case Summary Table

Option 1 – Active Travel Proposals for Penarth within the Vale of Glamorgan's Active Travel		
Description	This option involves delivering the proposals within the Vale of Glamorgan's Active Travel Integrated Network Map (INM). The provision of new active travel infrastructure would encourage greater levels of walking and cycling and improve links between key services. The proposal would improve connectivity and the attractiveness of active travel between key origins and destinations within Penarth and to the wider area. The INM proposals in the Penarth area include the Penarth Headland Link and Merrie Harrier to Pont-y-Werin proposed routes (amongst others). The option includes consideration of area-wide active travel measures e.g. introduction of 20mph zones/ limits, improved facilities at employment sites, expansion of the Cardiff bike hire scheme to Penarth, school travel plans and walking buses.	
How does it tackle the problem?	Delivery of the INM proposals will increase the attractiveness of walking and cycling in the study area and help to achieve a modal shift away from the private car towards more active modes of travel. The INM programme has the potential to improve the health and wellbeing of those travelling by active modes due to an increase in exercise, as well as those who are currently exposed to pollution caused by road traffic congestion. The intervention, if successful in creating a modal shift, may reduce congestion and improve journey times by public transport that is reliant on the road network. The following identified problems may be tackled by this option: • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; • Low levels of Active Travel; • Safety issues act as barrier to walking and cycling; • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; • Lack of facilities for cyclists at trip origin and destination; • Environmental factors reduce the attractiveness of walking and cycling; • Topography of the area acts as a barrier to walking and cycling; • Road traffic emissions and congestion contribute to reduced air quality and an AQMA has previously been in place on Windsor Road, Penarth; and • Poor connectivity to the wider area reduces potential of tourism and leisure visitors to the economy.	
Objectives	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel	+++
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	+++
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being	+++

	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	++
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	++
Adverse Impacts and Dependencies	• Impacts of individual schemes within the INM programme (e.g. environmental impacts) would need to be considered as the proposals are further developed. • Ongoing maintenance requirements following delivery of the INM proposals. • Some of the area-wide measures included within this option, e.g. provision of facilities at employment sites, expanding the bike hire scheme and walking buses, are reliant on implementation by a third party.	
Constraints	• High level of capital investment required to deliver the whole INM programme. • Environmental considerations due to the location of some INM proposals e.g. INM routes proposed within Conservation Area (as outlined in LDP map), INM routes proposed within Severn Estuary Special Protection Area (Penarth Headland Link). • Potential land ownership issues in relation to some INM proposals.	
Key Risks	Feasibility	0
	Acceptability	++
	Timescales	+
	Risks	+
	Comments: The INM contains a range of active travel scheme proposals that vary in technical feasibility from relatively small-scale schemes to large infrastructure projects. The most technically complex of all scheme proposals within the INM is the Penarth Headland Link, which is a large-scale engineering project that has a medium term 'predictive delivery time' within the INM. As this is part of a package of measures, higher risks may be associated with the largest-scale projects such as the Penarth Headland Link, though a number of localised improvements may be deliverable with far lower levels of risk. A greater assessment of the feasibility and risk associated with individual schemes will be developed at later stages of the WelTAG process if this option is recommended to be progressed. The full deliverability assessment of the long list of options is included in Appendix 7 (Worksheet 11) of the IAR.	

Table 2.4 - Option 2 – Strategic Case Summary Table

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage	
Description	This option involves providing attractive and convenient sustainable transport options for the journey between Penarth and Cardiff through the implementation of a bus park and ride scheme, associated bus priority measures and sustainable transport provision across Cardiff Barrage into Cardiff. Bus priority measures could include local widening, lane reallocation, junction upgrades at pinch points and would potentially require land acquisition. The scheme would also include improvements to bus stops along the route. At Cardiff Barrage this option involves the introduction of sustainable transport options for travel into Cardiff via Cardiff Barrage, which would significantly improve access from Penarth and Penarth Marina. A number of innovative sustainable transport options for linking Penarth and Cardiff were suggested during the WelTAG consultation including water taxis, self-driving electric pods/ vehicles/ bikes, monorail or shuttle bus linking Penarth and Cardiff, powered uphill cycle lifts and a cable car. Associated measures to be considered as part of this option include: - bus service improvements, and - measures to improve interchange and connectivity between public transport/sustainable transport modes to simplify the user experience e.g. improved timetabling, enhanced information provision etc.
How does it tackle the problem?	This option involves providing an attractive and convenient sustainable transport option for the journey between Penarth and Cardiff through the implementation of a bus park and ride scheme, associated bus priority measures and sustainable transport provision across Cardiff Barrage into Cardiff. The intervention would aim to reduce journey times by public transport that is reliant on the road network. The proposal would aim to remove car trips from the highway network in and around Penarth, reduce congestion along key routes and increase sustainable travel options for commuting journeys into Cardiff. The following identified problems may be tackled by this option: • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • High levels of car use and low levels of public transport usage; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; • Lack of Park and Ride facilities limits opportunities for Public Transport interchange; • Low levels of Active Travel; • Lack of facilities for cyclists at trip origin and destination; • Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and • Poor connectivity to wider area reduces potential of tourism and leisure visitors to the economy.

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage		
Objectives	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.	++
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	++
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being.	++
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	++
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	+
Adverse Impacts and Dependencies	• Impacts of the individual scheme elements (e.g. environmental impacts) would need to be considered as the proposal is further developed; • The introduction of bus priority measures on the existing highway network could have a negative impact on the journey times of private vehicles; • Consideration would need to be given to the infrastructure required to enable any sustainable transport option to travel the length of the barrage, as currently a significant section of the barrage is only accessible by pedestrians and cyclists; • The existing active travel route along the barrage may require widening and land acquisition, with potential issues of conflict between the sustainable transport option and those walking and cycling being a key issue; • Consideration would also need to be given to the operational nature of the barrage and the impact that water traffic crossing the barrage would have on timetabling and delays to any sustainable transport option; and • Potential ongoing revenue/ operating costs following delivery of the proposal.	
Constraints	• Availability of capital funding required to deliver the proposal; • Environmental and heritage considerations due to the proposed location of the Park and Ride at Cosmeston Lakes Country Park. The area is designated as a Local Nature Reserve; • The proposed Park and Ride site is within Flood Zone B as outlined within the Vale of Glamorgan's LDP (via the Development Advice Map); • Provision of bus priority measures will be constrained by available highway space; • Technical and operational challenges relating to the introduction of a sustainable transport link across Cardiff Barrage; • Cardiff Barrage is under the control of Cardiff Council; and • Potential land ownership issues e.g. the sustainable transport link across the Barrage may require crossing third party land.	
Key Risks	Feasibility	+
	Acceptability	0
	Timescales	+
	Risks	-

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage	
	Comments: Cardiff Barrage is under the control of Cardiff Council and the implementation of a scheme along Cardiff Barrage is reliant on the support and close cooperation of Cardiff Council. A feasibility study has previously been undertaken (commissioned by Cardiff Council) to evaluate the technical and operational viability of providing a bus-based public transport route via the Cardiff Barrage (Cardiff Bay Barrage Transport Link, Arup, 2015). Although the feasibility study focuses on the use of the barrage by buses, the issues considered will be of relevance to the introduction of any sustainable transport option along the barrage. It is considered that the nature of the sustainable transport option proposed will impact on the acceptability of the proposal e.g. the degree of impact that the sustainable transport option will have on the current use of the barrage by pedestrians and cyclists. A greater assessment of the feasibility and risk associated with individual elements of the proposal will be developed at later stages of the WelTAG process if this option is recommended to be progressed. The full deliverability assessment of the long list of options is included in Appendix 7 (Worksheet 11) of the IAR.

Table 2.5 - Option 3 – Strategic Case Summary Table

Option 3 - Multi-Modal Sustainable Transport Interchange	
Description	This option involves upgrading the existing railway station at Cogan to create a new multimodal transport interchange facility serving the Penarth Marina and Cardiff Bay areas. The option would deliver a mixed-use development that combines station enhancements, including an additional platform on the Penarth branch line, with residential and retail facilities. A study by Arup (2018) considered a number of sub-options for the station upgrade and provision of an expanded park and ride facility. The recommended sub-option includes the following elements: - A large park and ride facility (168 spaces) with improved facilities and road access located on a vacant site to the east of the study area; - Improvements to passenger facilities including a new station ticket hall, passenger waiting areas and customer toilets on the station platform; - Improved access on the A4160 Windsor Road and improvements to the road infrastructure including increased roundabout capacity; - Provision of bus and taxi interchange facilities to allow better links to Penarth Marina/ Cardiff Bay; - A new platform on the existing Penarth to Cardiff line; - A new 'access for all' footbridge to the main eastbound platform; - New residential development on the currently vacant site to the east. This option will also consider measures to improve interchange and connectivity between public transport / sustainable transport modes to simplify the user experience e.g. improved timetabling, enhanced information provision, secure bike parking etc.
How does it tackle the problem?	The multi-modal sustainable transport interchange option will see Cogan station, as well as the surrounding area, redeveloped in a way that supports public transport interchange, as well as improving walking and cycling provision within the vicinity. A multi-modal sustainable transport interchange at Cogan would see an improved station with more travel options for users e.g. connections between the Vale of Glamorgan line and the Penarth Branch (currently users must travel to Grangetown to change), as well as improvements to park and ride and train - bus interchange. The proposal therefore has the potential to alleviate the following of the identified problems: • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • High levels of car use and low levels of Public Transport use; • Sustainable transport options not an attractive alternative to car usage; • Unreliable and slow journey times of bus services; • Lack of Park and Ride facilities limits opportunities for Public Transport interchange; • Low levels of Active Travel; • Safety issues act as a barrier to walking and cycling; • Lack of safe, accessible and joined up and direct pedestrian and cycle routes; • Lack of facilities for cyclists at trip origin and destination;

Option 3 - Multi-Modal Sustainable Transport Interchange		
	• Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and • Poor connectivity to wider area reduces potential of tourism and leisure visitors to the economy.	
Objectives	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel	+
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	++
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being	+
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	++
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	+
Adverse Impacts and Dependencies	• Impact of the park and ride proposal on traffic levels on the local highway network would need to be considered; • Dense nature of the urban environment would need to be considered and the impact of construction on local communities; and • Ongoing revenue/ operating costs following delivery of the proposal.	
Constraints	• High capital investment needed to deliver the proposal. • Transport for Wales have responsibility for improvements to the rail network. • Potential land ownership issues in relation to the park and ride proposal. • Technical challenges in delivering improvements on operational rail land and at a constrained and congested location on the highway network. • Proposed site within Flood Zone B of the Vale of Glamorgan LDP (via Development Advice Map).	
Key Risks	Feasibility	+
	Acceptability	+
	Timescales	0
	Risks	0
	Comments: A key issue in relation to this option is the need for the scheme to be developed and delivered by Transport for Wales who have responsibility for improvements to the rail network. As such, the prioritisation and programming of the option to redevelop Cogan Station as a multi-modal transport interchange is not within the control of the local authority.	

Table 2.6 - Option 4 – Strategic Case Summary Table

Option 4 - Opening Cardiff Barrage to Private Vehicles During Peak Periods		
Description	This option involves allowing Cardiff Barrage to be used by private vehicles during peak periods.	
How does it tackle the problem?	The current route for all traffic travelling from Penarth to Cardiff is via heavily trafficked roads with high traffic volumes and problems of congestion. The route along Cardiff Barrage from Penarth to Cardiff Bay would be a significantly shorter and quicker route for those commuting from Penarth, especially for those working in and around Cardiff Bay. The proposal therefore has the potential to alleviate the following of the identified problems: • Volume of traffic and levels of congestion cause unreliable journey times, delay and pollution.	
Objectives	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.	---
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	---
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being.	---
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	0
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	-
Adverse Impacts and Dependencies	• Potential adverse impacts on the use of the barrage as an existing active travel route - concerns were raised at the WelTAG public consultation event; • Potential environmental impacts would need to be considered; • Consideration would need to be given to the infrastructure required to enable private vehicles to travel the length of the barrage, as currently a significant section of the barrage is only accessible by pedestrians and cyclists; • The existing active travel route along the barrage may require widening and land acquisition, with potential issues of conflict between private vehicles and those walking and cycling being a key issue; • Consideration would also need to be given to the operational nature of the barrage and balancing the use of the barrage by vehicles with the operation of the barrage in relation to the passage of water vessels; and • Impact of the proposal on traffic levels on the local highway network would need to be considered.	
Constraints	• Public acceptability and potential opposition to the introduction of private vehicles onto Cardiff Barrage. • Availability of capital funding required to deliver the proposal. • Technical and operational challenges relating to the introduction of private vehicles on Cardiff Barrage. • Cardiff Barrage is under the control of Cardiff Council.	

Option 4 - Opening Cardiff Barrage to Private Vehicles During Peak Periods		
	• Potential land ownership issues as the proposal may require crossing third party land.	
Key Risks	Feasibility	+
	Acceptability	---
	Timescales	-
	Risks	--
	Comments: Cardiff Barrage is under the control of Cardiff Council and the implementation of a scheme along Cardiff Barrage is reliant on the support and close cooperation of Cardiff Council. As such, this option would be dependent on Cardiff Council to enable delivery. At present there is no evidence that Cardiff Council are considering opening the barrage to private vehicles. Public acceptability and potential opposition to the introduction of private vehicles onto Cardiff Barrage is considered a risk. The full deliverability assessment of the long list of options is included in Appendix 7 (Worksheet 11) of the IAR.	

Table 2.7 - Option 5 – Strategic Case Summary Table

Option 5 - Do Minimum		
Description	This option involves undertaking no investment in new transport infrastructure and no dedicated sustainable transport improvements in the area, except from routine maintenance as and when required to keep routes operational.	
How does it tackle the problem?	The do minimum approach is likely to see existing problems become worse in the long term. It is not envisaged that this option would assist with tackling any of the identified problems.	
Objectives	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.	--
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	--
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being.	--
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	--
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	-
Adverse Impacts and Dependencies	• A do minimum approach would likely see identified problems become worse, particularly due to the planned future developments within the Vale of Glamorgan, as well as predicted increase in the population of the Cardiff Capital Region.	
Constraints	• No constraints identified as the do minimum approach assumes that no sustainable transport improvements are delivered.	
Key Risks	Feasibility	0
	Acceptability	--
	Timescales	0
	Risks	0
	Comments: A do minimum approach assumes that no sustainable transport improvements are delivered and has therefore not been rated in terms of technical feasibility, timescales and risk. This option has a negative rating in terms of acceptability, as a do minimum approach and a subsequent worsening of identified problems is unlikely to be an acceptable long-term option.	

2.9 Summary of the Strategic Case

The strategic case has outlined the existing problems affecting the Penarth Cardiff Barrage Corridor, many of which are a result of the current transport options and choices of those travelling to, from and within the study area. Problems associated with high levels of car use and relatively low levels of travel by more sustainable modes are having a negative impact on journey times, accessibility and connectivity, air quality and the safety of more vulnerable road users. The problems identified each have a negative impact on one or more of the goals of the Well-being of Future Generations (Wales) Act 2015 and therefore measures are needed to address the problems to ensure the long-term negative impacts are minimised.

The strategic case involved the identification of five study objectives and five potential options to address the problems affecting the study area. The long list of five potential options has been appraised against a number of national, regional and local policy objectives to assess their suitability and strategic fit as potential solutions. Each option has also been assessed against the five study objectives and its ability to address the identified problems.

Table 2.8 provides a summary of the results of the various appraisals and this is also included within Appendix 7 (Table 12) of the IAR. The detailed record of the assessment is provided in Appendix 7 (Tables 5-9 and 11) of the IAR.

Three options all performed well against the higher-level appraisal criteria e.g. the objectives of the Wales Transport Strategy and the Well-being of Future Generation (Wales) Act 2015. The three options that performed well are those that are focused on sustainable transport improvements. These are:

- Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM;
- Option 2 - Bus park and ride and sustainable transport links across Cardiff Barrage; and
- Option 3 - Multi-modal sustainable transport interchange.

The above three options were each assessed as likely to have a mostly positive impact on existing policy objectives at the national, regional and local level. Similarly, all three of the above options were assessed as having a positive impact on achieving each of the five study objectives and in addressing most of the identified problems within the study area. The option that was assessed as performing the best against the study objectives is Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM.

In general, Option 5 - Do Minimum did not perform well in the appraisal. A do minimum approach is likely to result in a worsening of existing problems and was assessed as having a negative impact on many policy objectives, in addition to the study objectives. The long-term impact of a do minimum option will adversely affect the goals of the Well-being of Future Generations (Wales) Act 2015.

The remaining option (Option 4 - Opening Cardiff Barrage to private vehicles during peak periods) also did not perform well in the appraisal. This option was assessed as having the greatest negative collective impact on the study objectives and an adverse impact on many of the identified problems.

The strategic case has identified three sustainable transport options that have the potential to have a positive impact on existing problems within the study area and on a range of national, regional and local policy objectives.

Table 2.8 – Summary of Option Appraisal

Option Ref	Option	Wales Transport Strategy Outcomes			WBOFGA Goals	Local Transport Plan Objectives	Cardiff Capital Region Strategic Objectives	Scheme Objectives					Tackling Problems	Appraisal Summary Table				Delivery
		Soc.	Econ.	Env.				1	2	3	4	5		Econ.	Env.	Soc. & Cul	Pub. Acc.	
1	Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM	+ +	+ +	+ +	+ +	+ +	+ +	+ + +	+ + +	+ + +	+ +	+ +	+ +	+ +	+	+ +	NYA	+
2	Bus park and ride and sustainable transport links across Cardiff Barrage	+ +	+ +	+	+	+ +	+	+ +	+ +	+ +	+ +	+	+	+	0	+ +	NYA	0
3	Multi-modal sustainable transport interchange	+ +	+ +	+	+	+ +	+	+	+ +	+	+ +	+	+	+ +	0	+ +	NYA	0
4	Opening Cardiff Barrage to private vehicles during peak periods	0	0	- -	- -	- -	-	- - -	- - -	- - -	0	-	- -	- -	- -	0	NYA	-
5	Do Minimum	-	- -	-	-	-	-	- -	- -	- -	- -	-	-	- -	-	-	NYA	0

Scheme Objectives:

1 = Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.
2 = Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.
3 = Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being.
4 = Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.
5 = Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.

NYA = Not yet assessed

3. Transport Case

3.1 Overview

As detailed in WelTAG 2017, 'the transport case tells you what the expected impacts of the project are, how the project will contribute to the well-being goals and whether a project will provide value for public money. This is calculated by thinking about social, cultural, environmental and economic costs and benefits of each option.'

The transport case is an evidence-based assessment of:

- What the impacts will be;
- The scale of those impacts;
- Where and when they will occur; and
- Who/what will experience them.

WelTAG 2017 also identifies that 'at Stage 1, the assessments of the impacts are likely to be mainly qualitative with indications provided of the numbers of people affected. Much of the evidence used will come from existing data sources and evaluations of relevant previous projects elsewhere.'

3.2 Monetarised Benefits

At the current stage of development, no cost estimates are available for the list of options under consideration and therefore a value for money assessment cannot be undertaken as part of the WelTAG Stage 1 appraisal. The development of cost estimates and a value for money assessment will be progressed at a later stage of the WelTAG appraisal process.

3.3 Non - Monetarised Benefits – Assessment of Impacts

The Transport Case assessment has involved undertaking a qualitative appraisal of the list of options against Economic, Environmental, Social and Cultural criteria. The appraisal has involved each option being assessed using the WelTAG seven-point assessment scale, as set out in Section 1.4 above. The appraisal also considered when and where the impacts will occur and who and/or what will experience the impacts. A summary of the results of this appraisal are presented below in Table 3.1 and is also included within Appendix 7 (Worksheet 10) of the IAR. Further justification and detail to support each of the appraisal scores provided in the table can be found in Appendix 8 of the IAR.

At WelTAG Stage 1, each option is at an early stage of development and this is reflected in the high-level and qualitative nature of the appraisal that has been undertaken. Due to the current stage of development of each of the options, certain impacts have yet to be assessed and these are identified as NYA (Not Yet Assessed) within the table. The appraisal of each option will be reviewed at WelTAG Stage 2 (Outline Business Case), when further qualitative and quantitative information about impacts may become available.

An assessment of how each option under consideration contributes to each of the well-being goals was undertaken as part of the Strategic Case, as detailed in Section 2.8 of this report. The assessment considered the seven national well-being goals within the Well-being of Future Generations (Wales) Act 2015 and the more localised well-being objectives of the Vale of Glamorgan Council and Vale of Glamorgan's Public Service Board. The detailed results of this appraisal are included in Appendix 7 (Worksheet 6) of the IAR.

Table 3.1 - Appraisal Summary Table

Criteria	Qualitative Assessment				
	Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM	Bus park and ride and sustainable transport links across Cardiff Barrage	Multi-modal sustainable transport interchange	Opening Cardiff Barrage to private vehicles during peak periods	Do Minimum
Economic					
Business Users & Reliability Impact	NYA	NYA	NYA	NYA	NYA
Regeneration	+ +	+	+ +	-	- -
Wider Impacts	+ +	+	+ +	- -	-
Environment					
Noise	+ +	+	0	- -	-
Air Quality	+ +	+	0	- -	-
Greenhouse Gases	+ +	+	0	- -	-
Landscape	0	-	+	- -	-
Townscape	+	0	+	-	-
Historic Landscape	0	0	0	0	0
Cultural Heritage	+	-	0	0	0
Biodiversity	0	-	0	-	-
Water Environment	0	0	0	-	0
Social and Cultural					
Commuting and Other Users	+	+ +	+ +	+	- -
Reliability Impact on Commuting and Other Users	+	+ +	+ +	+	- -
Physical Activity	+ + +	+	+	- - -	-
Journey Quality	+ + +	+ +	+ +	0	-
Accidents	NYA	NYA	NYA	NYA	NYA
Security	NYA	NYA	NYA	NYA	NYA
Access to Services	+ +	+ +	+ +	+	- -
Welsh Language	0	0	0	0	0
Tourism	+ +	+	+	- -	-
Affordability	NYA	NYA	NYA	NYA	NYA
Severance	+ + +	+ +	+ +	0	-
Option Values	NYA	NYA	NYA	NYA	NYA
Public Accounts					
Cost to Broad Transport Budget	NYA	NYA	NYA	NYA	NYA
Indirect Tax Revenues	NYA	NYA	NYA	NYA	NYA
Occurance of Impacts					
When and where impacts will occur (positive and negative)	During the construction and operational stages, in the vicinity of the routes. Impacts to the wider area if car trips are removed from the highway network.	During the construction and operational stages, in the vicinity of the proposal. Impacts to local roads and junctions as traffic is removed from the highway network.	During the construction and operational stages, in the vicinity of the proposal. Impacts to local roads and junctions during construction and as traffic is removed from the highway network in the long term.	During the construction and operational stages, in the vicinity of the proposal i.e. along Cardiff Barrage. Impacts to local roads and junctions due to changes in traffic movements.	Across the Penarth Cardiff Barrage Corridor including local roads and junctions, Penarth town centre etc.
Who or what will experience the impacts	Users of the active travel network. Users of the local highway network. Residents, businesses and visitors to Penarth.	Users of the service. Users of the local highway network. Residents, commuters, businesses and visitors to Penarth. Visitors to Cosmeston Lakes Country Park.	Users of the service. Users of the local highway network. Residents, commuters businesses and visitors to Cogan, Penarth Marina and Penarth.	Users of Cardiff Barrage. Users of the local highway network. Residents, commuters, businesses and visitors to Penarth, Penarth Marina, Cardiff Bay and Cogan.	Users of the local highway network. Residents, commuters, businesses and visitors to the Penarth Cardiff Barrage Corridor.

NYA = Not yet assessed

3.4 Summary of Transport Case

At this stage of option development, much of the information required to produce a full transport case is not available. However, a qualitative assessment of the economic, environmental, social and cultural impacts of the long list of options has been undertaken with the results presented in Section 3.3.

As with the Strategic Case assessment, the three options that focus on sustainable transport improvements performed well against the Transport Case qualitative assessment. These are:

- Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM;
- Option 2 - Bus park and ride and sustainable transport links across Cardiff Barrage; and
- Option 3 - Multi-modal sustainable transport interchange.

The above options were each assessed as likely to have a positive or neutral impact on each of the economic, social and cultural criteria and a positive or neutral impact on most of the environmental criteria. The option that was assessed as performing the best overall against the economic, environmental, social and cultural criteria is Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM.

In general, and as with the Strategic Case assessment, Option 5 - Do Minimum did not perform well in the appraisal and was assessed as likely to have a negative impact on many economic, environmental, social and cultural criteria. The long-term impact of a do minimum option will adversely affect the goals of the Well-being of Future Generations (Wales) Act 2015.

Option 4 (Opening Cardiff Barrage to private vehicles during peak periods) did not perform well in the appraisal overall and the option was assessed as likely to have a negative impact on many of the economic and environmental criteria.

The Transport Case assessment will be further developed in WelTAG Stage 2 for each of the recommended options.

4. Financial Case

4.1 Overview

As detailed in WelTAG 2017, 'the financial case tells you whether an option is affordable in the first place and the long-term financial viability of a scheme. It covers both capital and revenue requirements over the life time of the project and the implications of these for the balance sheet, income and expenditure accounts for public sector organisations.'

The following considerations should be made in outline at Stage 1:

- Lifetime costs of the project,
- Sources of funding, and
- Accounting implications.

4.2 Capital and Ongoing Costs and Source of Potential Funding

The financial case is not able to be considered in detail as part of WelTAG Stage 1, due to the current stage of development of each of the options under consideration. A greater understanding of the capital and lifetime costs of each of the options would be needed to enable a quantitative assessment of the financial case to be undertaken. This detail will be developed during later stages of the WelTAG process when progressing the recommended options.

At WelTAG Stage 1, a qualitative assessment of the financial case has been undertaken, which is detailed in Table 4.1 below. This considers factors affecting the lifetime costs of each option, potential sources of funding and accounting implications to public sector organisations. The assessment considers both the capital and revenue implications of each option.

Table 4.1 - Financial Case Assessment

Financial Case				
Option (Revenue/Capital)		***Lifetime Costs of the Project***	***Potential Source of Funding***	***Accounting Implications***
Option 1: Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM	Capital	- Capital cost at the start of the project relating to the delivery of any new active travel infrastructure. - The Active Travel INM contains a programme of schemes, which will vary in delivery cost on a scheme by scheme basis. Although cost estimates have not been established at this stage, it is likely the INM programme includes a combination of relatively low cost and high cost schemes. The Penarth Headland Link proposal is the highest cost scheme within the INM. - In May 2018 the Welsh Government committed £60 million funding for active travel over the next three years.	- Local Transport Fund, Active Travel Fund and Safe Routes in Communities funding from Welsh Government. - Potential for Section 106 contributions towards some active travel schemes depending on location. - Potential for land to be opened up for development and that funding used to assist. - Potential for private sector investment in the provision of active travel facilities at employment sites e.g. bike storage, showers etc.	- Local authority in relation to any grant funding/S106 contributions for the delivery of active travel schemes.
	Revenue	- Ongoing revenue costs to maintain any new active travel routes and associated infrastructure e.g. lighting, local authority owned bike storage/ parking. - The design of new infrastructure should seek to minimise ongoing maintenance requirements, which will need to be considered on a scheme by scheme basis.	- Local authority budgets for highway maintenance. - Potential for private sector investment to support the expansion of the bike hire scheme implemented in Cardiff.	- Local authority in relation to the maintenance of active travel infrastructure.

Financial Case				
Option (Revenue/Capital)		***Lifetime Costs of the Project***	***Potential Source of Funding***	***Accounting Implications***
Option 2: Bus park and ride and sustainable transport links across Cardiff Barrage	Capital	- Capital cost at the start of the project relating to the delivery of any new highway/ park and ride infrastructure. - Potential capital cost at the start of the project relating to the purchase of vehicles to support the bus park and ride and sustainable transport links across Cardiff Barrage. Option requires further development prior to determining capital cost implications linked to the purchase of vehicles.	- Local Transport Fund and Local Transport Network Fund from Welsh Government. - City Deal.	- Local authority in relation to grant funding.
	Revenue	- Ongoing revenue costs to maintain any new highway and associated infrastructure e.g. park and ride car park, CCTV at the park and ride, bus priority measures. - Consideration is needed of the model for the bus service that will serve the park and ride e.g. whether it will be a commercial or supported service and the cost of the service to the user. - Potential ongoing revenue costs in relation to the sustainable travel links across Cardiff Barrage. Option requires further development prior to determining revenue implications/ potential funding sources.	- Local authority budgets for highway/ CCTV maintenance.	- Local authority in relation to the maintenance of highway/ CCTV infrastructure.

Financial Case				
Option (Revenue/Capital)		***Lifetime Costs of the Project***	***Potential Source of Funding***	***Accounting Implications***
Option 3: Multi-modal sustainable transport interchange	Capital	- Significant capital cost at the start of the project relating to the delivery of new rail/ highway/ park and ride/ active travel infrastructure. - Potential capital costs linked to the purchase of additional rolling stock if the option results in an additional platform on the Penarth branch line leading to increased frequency of rail services.	- Welsh Government/ City Deal/ Metro	- Transport for Wales is the lead delivery body for rail schemes/ works on operational rail land - Local authority likely to be the lead delivery body for works to the local highway network
	Revenue	- Ongoing revenue costs to maintain any new rail/ highway/ park and ride/ active travel infrastructure.	- Transport for Wales budgets for maintenance of rail infrastructure. - Local authority budgets for highway maintenance.	- Transport for Wales in relation to the maintenance of rail infrastructure/ rolling stock - Local authority in relation to the maintenance of highway infrastructure

Financial Case				
Option (Revenue/Capital)		***Lifetime Costs of the Project***	***Potential Source of Funding***	***Accounting Implications***
Option 4: Opening Cardiff Barrage to private vehicles during peak periods	Capital	- Capital cost at the start of the project relating to the delivery of new highway infrastructure required to enable private vehicles to travel the length of the barrage.	- Local Transport Fund and Local Transport Network Fund from Welsh Government	- Local authority in relation to grant funding (Cardiff Barrage lies within the Cardiff Council area)
	Revenue	- Ongoing revenue costs to maintain any new highway infrastructure. - Potential ongoing revenue costs in relation to the operational implications of allowing private vehicles to access the barrage at specific times e.g. the means of restricting access outside peak hours. Option requires further development prior to determining revenue implications/ potential funding sources.	- Local authority budgets for highway maintenance.	- Local authority in relation to the maintenance of highway infrastructure
Option 5: Do Minimum	Capital	- No capital cost implications as the do minimum option assumes no investment in new transport infrastructure.	- N/A	- N/A
	Revenue	- Ongoing revenue requirements to maintain existing highway infrastructure and to subsidise existing supported bus services.	- Local authority budgets for highway maintenance. - Local authority budgets and Welsh Government's Bus Services Support Grant (BSSG) to subsidise bus services.	- Local authority

5. Commercial Case

5.1 Overview

As detailed in WelTAG 2017, 'the commercial case tells you if a scheme will be commercially viable, whether it is going to be possible to procure the scheme and then to continue it in to the future. It focuses in particular on the level and type of involvement of the private sector in each option. This includes items that affect the delivery of the option and its on-going viability, for example, will there be an on-going need for revenue support, will there be any charges levied on users or non-users and the allocation of risk for the provision of the project and during its on-going operation.' Such considerations will be made in outline at Stage 1 of the WelTAG process.

5.2 Procurement Method

Each option under consideration (other than the do minimum) will require the procurement of capital works to deliver new infrastructure for the sustainable transport improvements. One issue affecting the procurement of the capital works will depend on the lead delivery body for each option. For example, due to the nature of the options currently being considered at WelTAG Stage 1, there may be different bodies that would lead on delivery. For example, the delivery of the Vale of Glamorgan's Active Travel INM is likely to be led and procured by the Vale of Glamorgan Council, whereas the multi-modal sustainable transport interchange option is likely to be led and potentially procured by Transport for Wales. Any option that involves the use of Cardiff Barrage will require involvement by Cardiff Council, in addition to the Vale of Glamorgan Council, and could result in elements of the options involving Cardiff Barrage being procured by different bodies.

Each recommended option will be procured in line with the lead body's financial regulations and standing orders for contracts to ensure best value. The method of procurement will also need to be in line with any grant funding requirements, depending on how the preferred option is financed.

The length of the contract relating to each of the options is unknown at this stage and will be further developed during later WelTAG stages. At this stage, with no chosen preferred option, it is not possible to provide an outline of the final procurement methodology that will be followed.

5.3 TUPE / HR Implications

It is difficult to confirm whether there will be any TUPE or HR implications until a final preferred option is known. The implications for existing/ additional staff requirements will need to be considered as the recommended options are further developed e.g. whether additional staff are required to support any new facilities and/or services that are delivered and who would be the employing organisation of any additional staff. This will be assessed at future stages of appraisal.

6. Management Case

6.1 Overview

As detailed in WelTAG 2017, 'the management case tells you if an option is achievable. This case covers the delivery arrangements for the project and then its management during its life time. It covers the arrangements for the procurement, construction and on-going operation of the intervention, details of the monitoring arrangements and the undertaking of the evaluation plan. The management case should embed the five ways of working.'

At this stage, as limited development work has been undertaken on each of the options, the management case has involved a high-level assessment of factors that may impact on the delivery of each option.

6.2 Scheme Development, Delivery Arrangements and Legal Powers

At present no formal design work has been undertaken on any of options included within the long list. Design work will need to be progressed at a later stage of the WelTAG appraisal process and development of the preferred option will need to be in line with the five ways of working of the Well-being of Future Generations (Wales) Act 2015. This will ensure that the preferred option is developed collaboratively and with the involvement of interested parties.

At this stage it is difficult to determine the statutory procedures that would need to be followed in the delivery of the preferred option. As such, consideration has been given to the potential statutory procedures that might need to be completed in the delivery of a sustainable transport scheme along the Penarth Cardiff Barrage corridor. These are as follows:

- Planning permission and associated processes e.g. Environmental Impact Assessment;
- Environmental and ecological processes;
- Compulsory Purchase Orders may be needed to acquire land to enable a desired route alignment;
- Large-scale interventions may be subject to a public inquiry;
- Liaison with statutory bodies and service providers e.g. Welsh Government, Transport for Wales, bus operators, Cardiff Harbour Authority and Cardiff Council (for options that impact upon Cardiff Barrage);
- Traffic Regulation Orders; and
- Completion of GRIP process for options that impact upon the rail network.

This list is not exhaustive and will be developed further at future WelTAG stages as options are rationalised and a final preferred option chosen.

As detailed in Section 5.2 above, the lead body for the scheme could vary depending on the preferred option that is taken forward. Section 5.2 considered how the lead body could impact on procurement arrangements. The lead body will also impact on how scheme development progresses and the working arrangements that will be required to undertake the required statutory procedures and to deliver the preferred option on the ground. Similarly, the preferred option will impact upon roles and responsibilities for the ongoing management and operation of the option following its delivery. For example, the local authority would be responsible for the long-term management and operation of schemes on the local highway network whereas Transport for Wales would have responsibility for schemes on the rail network.

Issues such as these will be further considered in later stages of the WelTAG appraisal as the recommended options are developed in greater detail. This will include consideration of the arrangements and responsibilities for monitoring and evaluating scheme impacts. A Benefits Realisation and Monitoring and Evaluation Plan will be produced for a final preferred option at WelTAG Stage 3 (Final Business Case), which will set out the arrangements for monitoring and evaluation following scheme delivery. This will ensure the long-term impacts of the preferred

option are monitored and evaluated to ensure objectives are being achieved and benefits realised.

6.3 Governance, Project Management and Reporting

The WelTAG Stage 1 work has been project managed by Arcadis Consulting UK Ltd on behalf of the Vale of Glamorgan Council. As the project develops during the later WelTAG stages, further project governance structures will be put in place as required e.g. the setting up of a Project Board and project reporting arrangements. Vale of Glamorgan Council/ Arcadis Consulting UK Ltd are taking the lead on the communication and stakeholder management aspects related to the WelTAG Stage 1 study.

WelTAG 2017 states that, 'At Stage One, the management case should set out which organisation and groups will sit on the Review Group that meets at the end of each WelTAG Stage. This group will consider the contents of the Stage Report and decide on the actions to be taken at the end of each stage.'

The WelTAG Stage 1 Review Group has included the Vale of Glamorgan Council Scheme Project Manager, the Head of Neighbourhood Services and Transport as the Senior Responsible Owner (SRO) and has included consideration by the Council's Penarth Project Board. The Review Group has been responsible for considering the output of the Stage 1 (Strategic Outline Case) report, each of the options presented and deciding on the actions to be taken forward to a Stage 2 appraisal. The WelTAG Stage 2 Review Group will be broadened to involve individuals from a range of backgrounds and expertise across the four aspects of well-being i.e. social, cultural, environmental and economic.

6.4 Consultation

As detailed in Section 2.2, the development of the WelTAG Stage 1 (Strategic Outline Case) has been informed by two consultation events with stakeholders and the public. The continued involvement of key stakeholders and interested parties will be important in taking forward the next stages of the WelTAG process and in the development of the preferred option.

6.5 Project Risks, Constraints and Deliverability

At this WelTAG Stage 1 (Strategic Outline Case), a high-level consideration of option deliverability has been undertaken as part of the appraisal process. The summary appraisal tables included in Section 2.8 of this report include an assessment of constraints and key risks that could affect delivery of each option e.g. in terms of feasibility, acceptability and timescales for delivery. A more detailed assessment of issues affecting the deliverability of each option is included in Appendix 7 (Worksheet 11) of the IAR.

The assessment has highlighted that all options being considered (other than the do minimum) have specific risks to delivery. One issue highlighted is that three of the options under consideration are reliant on third parties to enable delivery of key elements of the proposals. The issues affecting the three options are described below:

Option 2 - Bus park and ride and sustainable transport links across Cardiff Barrage – An element of this option is the implementation of a sustainable transport link across Cardiff Barrage. The barrage is under the control of Cardiff Council and implementation of a scheme along Cardiff Barrage is reliant on the support and close cooperation of Cardiff Council. A feasibility study has previously been undertaken, which was commissioned by Cardiff Council, to evaluate the technical and operational viability of providing a bus-based public transport route via the Cardiff Barrage (Cardiff Bay Barrage Transport Link, Arup, 2015). Cardiff Council has therefore previously investigated the feasibility of the introduction of a sustainable transport option onto the barrage and may be supportive of a future proposal. Should this option be recommended as

progressing to WelTAG Stage 2, then a dialogue will be needed with Cardiff Council to establish the current position regarding the proposal. Other identified risks affecting delivery of this option include:

- The need to carefully manage potential issues arising from the siting of the park and ride car park at Cosmeston Lakes Country Park;
- Technical challenges in implementing bus priority measures due to the constraints of the existing highway network and in implementing a sustainable transport option across the barrage;
- The need to manage potential conflict with more vulnerable users of Cardiff Barrage i.e. those walking and cycling; and
- Potential need to acquire land to implement a sustainable transport option across the barrage.

Option 3 - Multi-modal sustainable transport interchange - A key issue and risk in relation to the option to provide a multi-modal transport interchange at Cogan Station is the need for the scheme to be developed and delivered by Transport for Wales who have responsibility for improvements to the rail network. The timescales for developing, designing and implementing the scheme will be wholly dependent on Transport for Wales. As such, the prioritisation and programming of the option to redevelop Cogan Station as a multi-modal transport interchange is not within the control of the local authority. Other identified risks affecting delivery of this option include:

- Potential need to acquire land to enable delivery of the park and ride facility; and
- Technical challenges in delivering improvements at a constrained and congested location on the highway network and due to the dense nature of the urban built environment.

Option 4 - Opening Cardiff Barrage to private vehicles during peak periods – As described in relation to Option 2 above, the barrage is under the control of Cardiff Council and implementation of a scheme to open Cardiff Barrage to private vehicles is reliant on the support and close cooperation of Cardiff Council. As such, this option would be dependent on Cardiff Council to enable delivery. At present there is no evidence that Cardiff Council are considering opening the barrage to private vehicles. Other identified risks affecting delivery of this option include:

- Public acceptability and potential opposition to the introduction of private vehicles onto Cardiff Barrage;
- Technical challenges in opening the barrage to private vehicles;
- The need to manage potential conflict with more vulnerable users of Cardiff Barrage i.e. those walking and cycling; and
- Potential need to acquire land to implement a route for vehicles across the barrage.

The only option that is not reliant on third parties to enable delivery of key elements is **Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM**. The delivery of most elements of this option are within the control of the local authority in terms of the prioritisation, programming and subsequent delivery of active travel schemes. This option includes a range of Active Travel scheme proposals that vary in technical feasibility from relatively small-scale schemes to large infrastructure projects. As such the risks associated with delivery of this option will vary from scheme to scheme within the INM programme. The most technically complex of all scheme proposals within the INM is the Penarth Headland Link, which is a large-scale engineering project that has a medium term 'predictive delivery time' within the INM programme. As this is part of a package of measures, higher risks may be associated with the largest-scale projects such as the Penarth Headland Link, though a number of localised improvements may be deliverable with far lower levels of risk. Should this option be recommended to progress to WelTAG Stage 2, a greater assessment of the feasibility and risk associated with individual active travel schemes within the programme will be developed.

In addition to the specific risks associated with each option, there will also more general risks that will need consideration and will be applicable to all options, such as the reliance on external funding to enable delivery and engineering project risks.

Due to the early stage of development of each of the options, all potential risks to delivery cannot be identified and quantified at this stage of the WelTAG process. Therefore, the risk and deliverability issues highlighted represent those that are known from the existing information that is available. Further feasibility work would be required to identify all risks before any option was implemented. As further development work is undertaken on the recommended options, a better understanding will be developed of constraints and potential risks that may impact upon project delivery.

7. Conclusion and Recommendations

7.1 Summary

This WelTAG Stage 1 (Strategic Outline Case) has identified existing problems affecting the Penarth Cardiff Barrage Corridor. A summary of the problems identified are:

- Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution;
- Volume of traffic is a barrier to walking and cycling;
- High levels of car use and low levels of public transport use;
- Sustainable transport options not an attractive alternative to car travel;
- Unreliable and slow journey times of bus services;
- Lack of park and ride facilities limits opportunities for public transport interchange;
- Low levels of Active Travel;
- Safety issues act as a barrier to walking and cycling;
- Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes;
- Lack of facilities for cyclists at trip origin and destination;
- Environmental factors reduce the attractiveness of walking and cycling;
- Topography of the area acts as a barrier to walking and cycling;
- Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and
- Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.

The problems identified are associated with high level of car use and relatively low levels of travel by more sustainable modes, which are having a negative impact on e.g. journey times, accessibility and connectivity, air quality and the safety of more vulnerable road users. The problems identified each have a negative impact on one or more of the goals of the Well-being of Future Generations (Wales) Act 2015 and therefore measures are needed to address the problems to ensure the long-term negative impacts are minimised.

The WelTAG Stage 1 process has involved the identification of five study objectives and a long list of five potential options to address the problems affecting the study area. These were developed through a process of consultation with officers, wider stakeholder organisations and the public. The long list of options is as follows:

- Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM;
- Option 2 - Bus park and ride and sustainable transport links across Cardiff Barrage;
- Option 3 - Multi-modal sustainable transport interchange;
- Option 4 - Opening Cardiff Barrage to private vehicles during peak periods; and
- Option 5 - Do minimum.

The long list of five potential options has been appraised against national, regional and local policy objectives to assess their suitability and strategic fit as potential solutions. Each option has also been assessed against the five study objectives, its ability to address identified problems and a qualitative assessment has been undertaken of the options against economic, environmental, social and cultural criteria.

The WelTAG Stage 1 report also includes a consideration of issues affecting scheme development and delivery for each option within the long list. This includes issues such as statutory procedures, funding requirements and procurement options. An early stage assessment has also been undertaken of potential risk and deliverability issues affecting each option. Issues such as these will be further considered in later stages of the WelTAG appraisal process, as the recommended options are developed in greater detail.

7.2 Recommendations

The initial high-level appraisal has highlighted two options that are viewed as less favourable due to their likely negative impact on many policy objectives, the study objectives and on many economic, environmental, social and cultural criteria. These are:

Option 4 - Opening Cardiff Barrage to private vehicles during peak periods – This option did not perform well in the appraisal. It was assessed as having the greatest negative collective impact on the study objectives, an adverse impact on many of the identified problems and likely to have a negative impact on many of the economic and environmental criteria. In terms of deliverability, public acceptability and potential opposition to the introduction of private vehicles on Cardiff Barrage is considered a risk. However, it should be noted that there was evidence of support for this option during the WelTAG consultation. In addition, as the barrage is under the control of Cardiff Council, the option is reliant on Cardiff Council for delivery. **It is not recommended that this option be progressed for further appraisal to WelTAG Stage 2.**

Option 5 - Do Minimum – This option did not perform well in the appraisal. A do minimum approach is likely to result in a worsening of existing problems and was assessed as having a negative impact on many policy objectives, in addition to the study objectives. It was assessed as likely to have a negative impact on many economic, environmental, social and cultural criteria. The long-term impact of a do minimum option will adversely affect the goals of the Well-being of Future Generations (Wales) Act 2015. Although this option did not perform well in the appraisal, **the do minimum option will be progressed to WelTAG Stage 2** to provide the baseline against which the recommended options will be assessed.

Three of the options within the long list performed well in the appraisal and are those options that are focused on sustainable transport improvements. These are:

- Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM;
- Option 2 - Bus park and ride and sustainable transport links across Cardiff Barrage; and
- Option 3 - Multi-modal sustainable transport interchange.

The above three options were each assessed as likely to have:

- A mostly positive impact on existing policy objectives at the national, regional and local level.
- A positive or neutral impact on each of the goals of the Well-being of Future Generations (Wales) Act 2015;
- A positive impact on achieving each of the five study objectives and in addressing most of the identified problems within the study area; and
- A positive or neutral impact on each of the economic, social and cultural criteria and a positive or neutral impact on most of the environmental criteria.

The option that was assessed as performing the best against the study objectives and against the economic, environmental, social and cultural criteria is **Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM**. **It is recommended that this option be progressed for further appraisal at WelTAG Stage 2.**

In terms of the remaining two options (Options 2 and 3), the assessment of scheme deliverability has highlighted a key issue that presents a risk to the delivery of each option. This is the reliance on third parties to enable delivery of key elements of the two options.

In relation to **Option 2 - Bus park and ride and sustainable transport links across Cardiff Barrage**, this element of risk is limited to the Cardiff Barrage section of the scheme proposal, due to the barrage being in the control of Cardiff Council. It is considered that Cardiff Council may be supportive of a proposal to provide a sustainable transport link across the barrage, as Cardiff Council has previously commissioned feasibility studies into such a proposal. The remaining elements of the scheme proposal to provide a park and ride facility and bus priority measures are within the control of Vale of Glamorgan Council. **It is recommended that this option be progressed for further appraisal at WelTAG Stage 2.**

In relation to **Option 3 - Multi-modal sustainable transport interchange**, all elements of the scheme are dependent on Transport for Wales developing and delivering the proposal, as Transport for Wales has responsibility for improvements to the rail network. The timescales for implementing the proposal are therefore dependent on Transport for Wales and are not within the control of the local authority. Due to the scheme lying outside of the responsibility of the local authority and the consequent risks surrounding delivery of the proposal, the local authority has approached Transport for Wales to seek support for the multi-modal interchange proposal being taken forward as part of the Stage 2 appraisal. Confirmation has been received that Transport for Wales would welcome this option being considered as part of a Stage 2 appraisal. Following this confirmation, **it is recommended that this option be progressed for further appraisal at WelTAG Stage 2.**

Therefore, the options that are recommended to be progressed to WelTAG Stage 2 are:

- Option 1 - Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM;
- Option 2 - Bus park and ride and sustainable transport links across Cardiff Barrage;
- Option 3 - Multi-modal sustainable transport interchange; and
- Option 5 – Do minimum.

7.3 Review Group

In line with WelTAG 2017, an independent Review Group has overseen and reviewed the WelTAG Stage 1 appraisal output.

7.4 Further Work

In order to complete the WelTAG Stage 2 (Outline Business Case) on the recommended shortlist of options detailed in Section 7.2, the following further work may need to be undertaken. Development of the short list of options will need to be in line with the five ways of working of the Well-being of Future Generations (Wales) Act 2015. The following list is not exhaustive and further information or tasks may need to be undertaken as appraisal work develops. This further work will improve the evidence base:

- **Option development work** – Further investigative work would be required into each of the recommended options to enable a more detailed understanding of the issues, constraints and risks associated with delivery. In terms of Option 1 (Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM), results from the Welsh Government Active Travel Audit Tool assessment will be interrogated to identify quick win opportunities. In terms of Option 2 (Bus park and ride and sustainable transport links across Cardiff Barrage) further work is needed to determine the route and the scope and nature of the sustainable transport link across Cardiff Barrage.

- **Value for Money assessment** – A Value for Money assessment would be required through the production of a Benefit Cost Ratio (BCR) for each of the recommended options. It is assumed that the data required to produce the value for money assessment can be provided by the Client via existing survey data and transport models such as the South East Wales Transport Model.

- **Development of the Five Cases** – The Five Cases for each of the recommended options would need to be developed further. The Strategic Case would need to be checked and updated for each option and further information provided in the Transport, Financial, Commercial and Management cases.

- **Further consultation and engagement** – During the WelTAG Stage 2 (Outline Business Case) appraisal process, further stakeholder engagement will be important to gather views and more detailed information on each of the recommended short list of options. For example, a dialogue will be needed with Cardiff Council in relation to the introduction of a sustainable transport link on Cardiff Barrage.

- **Consideration of future monitoring** – Although a monitoring plan cannot be produced in detail until WelTAG Stage 3 (Full Business Case), it would be beneficial to give some consideration to the types of data and areas that will need monitoring. This should include the data that would require collection for each of the short list of options. This can then be detailed in the Stage 2 Management Case.

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Appendix 2 – WelTAG Stage Two Appraisal Methodology Note

WelTAG Stage Two – Methodology Note

This note outlines the methodology that has been used for the appraisal of the shortlisted options at WelTAG Stage Two.

Strategic Case

As part of WelTAG Stage One, a Strategic Case was produced. This has been reviewed and updated as part of the WelTAG Stage Two process. The Strategic Case review confirmed that the policy context, case for change, identified problems and study objectives remain current for WelTAG Stage Two.

The shortlisted options have been assessed to ensure strategic fit with relevant national, regional and local policy objectives. Each option has also been assessed against the five study objectives and its ability to address the identified problems. An assessment has also been undertaken of the impact of each option on the goals of the Well-being of Future Generations (Wales) Act 2015, the Welsh Government's well-being objectives and the well-being objectives of the Vale of Glamorgan Council and the Vale of Glamorgan's Public Services Board.

Transport Case

A quantitative economic assessment has been undertaken as part of the Transport Case that has considered the costs and benefits of each option. The economic assessment has been undertaken in accordance with WelTAG and Department for Transport Appraisal Guidance (WebTAG). The economic assessment has been developed using preliminary cost estimates for each option and has used existing data sources to quantify the benefits of each option. No new survey data has been collected as part of the WelTAG Stage Two process. The data sources used to quantify the benefits of each option are detailed in Section 3.3 of the WelTAG Stage Two report.

The Transport Case assessment has also involved undertaking a qualitative appraisal of each option against a range of economic, environmental, social and cultural criteria. The impacts of each option, in terms of where and when they will occur and who will experience them, has also been considered.

Financial and Commercial Cases

The affordability of each option has been considered through an assessment of the lifetime costs of each option (capital and revenue), potential sources of funding and the ongoing viability of each option e.g. due to ongoing funding requirements.

Management Case

Risks and deliverability issues have been identified at a high level for each of the shortlisted options. These are based on existing available information and option development work that has been undertaken as part of the WelTAG Stage Two process.

Deliverability has been assessed in terms of:

- Technical feasibility – This considered aspects affecting the feasibility and technical complexity of the options proposed, with consideration given to elements such as land constraints;
- Acceptability – This considered the acceptability of each option to the public and politically;
- Timescales – This involved a high-level consideration of the potential timescales for implementation of the proposal; and
- Risks – This considered known potential risks to the development and delivery of each option.

Evidence Base

Evidence to support the appraisal of the short list of options undertaken at WelTAG Stage Two has been obtained from existing and available studies (as detailed throughout the WelTAG Stage Two report) and through the option development work that has been undertaken as part of the WelTAG Stage Two process.

Assessment Scale

A seven-point likert scale was adopted for the appraisal of options (as detailed in WelTAG Guidance 2017 and used at WelTAG Stage One). This assessment scale is as follows:

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large Negative (- - -)

Weighting

No weighting has been applied to any of the assessment criteria. The ability of each option to address the identified problems, achieve the study-specific objectives and issues in relation to value for money and deliverability have played an important role in differentiating options. However, all appraisal criteria have been considered in making the overall recommendation of which shortlisted option to take forward to WelTAG Stage 3.

Validation Process

The assessment of each option against the appraisal criteria has been undertaken by a Senior Transport Planning professional with WelTAG appraisal experience.

The results of the appraisal have then been checked and approved by a second Senior Transport Planning professional with relevant WelTAG experience.

Finally, appraisal results were checked and approved by Arcadis Consulting UK Ltd on behalf of the Vale of Glamorgan Council officers before being presented to the independent review group for comment.

Consultation has been undertaken with a wide range of stakeholders to allow feedback on the proposed shortlisted options. Public opinion of the short list of options has also been sought via a public exhibition and through a period of public consultation.

Appendix 3 Well-being of Future Generations (Wales) Act 2015 – Application of the Five Ways of Working

Well-being of Future Generations (Wales) Act 2015 – Application of the Five Ways of Working

The Well-being of Future Generations (Wales) Act 2015 identifies five 'ways of working' that public bodies need to apply when making their decisions. The five ways of working have been applied throughout the WelTAG process, from identifying problems affecting the study area and developing objectives to short-listing and assessing options. The following table sets out how the five ways of working have been applied during WelTAG Stages One and Two.

Five ways of working as defined by the Act	How applied and addressed throughout WelTAG Stages One and Two
Long term – The importance of balancing short-term needs with the need to safeguard the ability to also meet long-term needs.	• The WelTAG Stage One report considered in detail the problems affecting the study area and the **long-term** implications of the problems identified. This included an identification of **long-term** trends using information from the Well-being Assessment produced by the Vale of Glamorgan Public Services Board. • WelTAG Stage One involved the identification of **long-term** objectives for the study area to address the problems identified. • The process identified that many of the problems and objectives identified cannot be addressed in the short-term and need **long-term** solutions. • Consideration of the **long-term** impacts of options has been central to the WelTAG appraisal process. • The appraisal of options at WelTAG Stages One and Two involved assessing the ability of an option to address the **long-term** trends and problems identified and achieve the **long-term** objectives. • The appraisal of options has included assessing the options against a range of **long-term** policy objectives. • The appraisal of options has included assessing the well-being impacts of options in relation to national and local well-being goals and objectives. This has involved considering the **long-term** impacts of each of the options. • The development of the Transport Case has considered the **long-term** impacts of each option against a range of social, cultural, environmental and economic criteria. • The economic assessment undertaken at WelTAG Stage Two has considered the **long-term** costs and benefits of each option. • The development of the Financial and Commercial Cases have considered the **long-term** viability of each option. This has included consideration of the lifetime capital and revenue costs of each option and ongoing funding that may be required e.g. in relation to operation and maintenance costs.
Prevention – How acting to prevent problems occurring or getting worse may help public bodies to meet their objectives.	• **Prevention** of the worsening of existing problems is the basis on which the WelTAG Stage One and Two reports have been developed. • The WelTAG Stage One report considered in detail the problems affecting the study area and identified objectives and options specifically aimed at addressing the problems and **preventing** the problems getting worse in the future. • The appraisal of options at WelTAG Stages One and Two involved assessing each option in terms of their ability to address the identified problems in the study area and therefore **prevent** the worsening of existing problems. This appraisal process ensures that the options that are progressed aim to **prevent** the identified problems from getting worse into the future. • The development of the Transport Case has considered the impacts of each option against a range of social, cultural, environmental and

Five ways of working as defined by the Act	How applied and addressed throughout WelTAG Stages One and Two
	economic criteria. This appraisal process requires the consideration of the potential impact of each option in **preventing** the worsening of existing problems. • The economic assessment undertaken at WelTAG Stage Two has quantified the benefits of each shortlisted option, which has provided greater detail of the potential impact of each option on addressing identified problems. • Options that are recommended to be taken forward to WelTAG Stage Three will be those that are considered to have the greatest impact on **preventing** identified problems from worsening and on meeting the study objectives.
Integration – Considering how the public body's well-being objectives may impact upon each of the well-being goals, on their other objectives, or on the objectives of other public bodies.	• **Integration** and consideration of the objectives of other public bodies has been important throughout WelTAG Stages One and Two to ensure the WelTAG objectives and options are not developed in isolation. • The well-being goals of the Well-being of Future Generations (Wales) Act 2015 played a key part in the development of the Strategic Case at WelTAG Stage One e.g. consideration was given to how the identified problems impacted directly on the well-being goals, study objectives were formed to **integrate** with the well-being goals and contribute to the five ways of working. • The appraisal of options at WelTAG Stages One and Two has involved assessing the options against the well-being and policy objectives of a range of public bodies i.e. the well-being goals of the Well-being of Future Generations (Wales) Act 2015, the Welsh Government's Wales Transport Strategy and well-being objectives, the Cardiff Capital Region's objectives, the Vale of Glamorgan's Public Services Board's well-being objectives, the Vale of Glamorgan Council's Local Transport Plan and well-being objectives. This appraisal process has considered the level of **integration** and potential impact that each option would have on the objectives of other public bodies. This ensures the fit of each option with the well-being objectives of other public service bodies.
Collaboration – Acting in collaboration with any other person (or different parts of the body itself) that could help the body to meet its well-being objectives.	• **Collaboration** with stakeholders has been important during WelTAG Stages One and Two. Two stakeholder workshops have been held and consultation with relevant stakeholders has been undertaken during the development of options. Full details of the stakeholder workshops are included in the WelTAG Stage One and Two Consultation Reports. • At WelTAG Stage One, a stakeholder workshop was held in January 2019 to identify the current problems and constraints within the study area and to identify potential solutions to these problems. The seven well-being goals of the Well-Being of Future Generation (Wales) Act 2015 were considered when identifying potential solutions at the workshop. The workshop was attended by 26 stakeholders, including representatives from national and local government, transport operators and town councils. The outputs from the stakeholder workshop helped to inform the Strategic Case, including the identification of problems, the development of objectives and the development of a list of potential options to address the problems. • At WelTAG Stage Two, a further stakeholder workshop was held in May 2019, to gather views from stakeholders on the advantages and disadvantages of each option, along with opportunities, constraints, risks or dependencies associated with each option. The workshop was attended by 19 stakeholders, including representatives from local

Five ways of working as defined by the Act	How applied and addressed throughout WelTAG Stages One and Two
	government, public service bodies and transport operators. Views submitted on each of the shortlisted options were used to inform the development and appraisal of the options at WelTAG Stage Two. • At WelTAG Stage Two, consultation was undertaken with relevant stakeholders during the development of options e.g. a stakeholder meeting was held with Cardiff Bus in April 2019, correspondence with Transport for Wales in relation to planned works on the rail network, correspondence with Cardiff Council in relation to the Cardiff Barrage proposal, correspondence with Sustrans in relation to the Active Travel proposals. • Continued **collaboration** with stakeholders will be important in taking forward future stages of the WelTAG process and in the development of the preferred option. This will ensure a collaborative approach to addressing the identified problems and achieving objectives. • The WelTAG Stage One and Two reports emphasises the importance of **collaboration** in the future development of options and highlights key stakeholders that will be important in taking forward the recommended options.
Involvement – The importance of involving people with an interest in achieving the well-being goals, and ensuring that those people reflect the diversity of the area which the body serves.	• The **involvement** of the public has been important during WelTAG Stages One and Two. Two public consultation events and a six-week public consultation have been undertaken to try to capture the diversity of opinion from people within the study area. Full details of the consultation activities are included in the WelTAG Stage One and Two Consultation Reports. • At WelTAG Stage One, a public consultation event was held in January 2019 to identify the current problems and constraints within the study area and to identify potential solutions to these problems. The seven well-being goals of the Well-Being of Future Generation (Wales) Act 2015 were considered when identifying potential solutions. The event was attended by 116 members of the public. The outputs from the public consultation event helped to inform the Strategic Case at WelTAG Stage One, including the identification of problems, the development of objectives and the development of a list of potential options to address the problems. • At WelTAG Stage Two, a further public consultation event was held in June 2019, to gather views from the public and interested parties on each of the short-listed options. The event was attended by 100 members of the public. This was followed by a six-week consultation period to enable those who were unable to attend the consultation event to provide comments via a consultation questionnaire. A total of 295 completed questionnaires were received during the consultation period. Views submitted on each of the shortlisted options were used to inform the development and appraisal of the options at WelTAG Stage Two.

Appendix 4 Local Authority Population Projections for Wales to 2039

			2014	2015	2016
Wales			3092036	3099890.089	3108054.116
Wales	North Wales		694038	695549.2862	697122.4823
	North Wales	Isle of Anglesey	70169	70165.46996	70170.04003
		Gwynedd	122273	122604.9811	122948.1154
		Conwy	116287	116414.0618	116561.0159
		Denbighshire	94791	94958.88562	95143.53475
		Flintshire	153804	154087.9111	154372.4202
		Wrexham	136714	137317.9766	137927.356
	Mid and South West Wales		898451	899902.3963	901436.0365
	Mid and South West Wales	Powys	132675	132486.6526	132303.2884
		Ceredigion	75425	75640.44152	75864.04412
		Pembrokeshire	123666	123757.7367	123858.2738
		Carmarthenshire	184898	185181.154	185485.366
		Swansea	241297	242157.0317	243046.2847
		Neath Port Talbot	140490	140679.3798	140878.7795
	South East Wales		1499547	1504438.407	1509495.597
	South East Wales	Bridgend	141214	141622.4225	142037.5919
		Vale of Glamorgan	127685	127833.1382	127984.7619
		Cardiff	354294	357353.4454	360490.624
		Rhondda Cynon Taf	236888	237239.6431	237626.2624
		Merthyr Tydfil	59065	59101.17309	59139.28901
		Caerphilly	179941	180205.6602	180480.6357
		Blaenau Gwent	69674	69609.08009	69548.53917
		Torfaen	91609	91702.64222	91799.44452
		Monmouthshire	92336	92487.0279	92639.17717
		Newport	146841	147284.1739	147749.271

2017	2018	2019	2020	2021	2022
3116371.191	3124784.313	3133335.714	3142023.838	3150820.724	3159716.206
698715.5184	700310.5074	701922.7379	703548.0874	705183.8378	706826.4049
70176.04367	70174.9803	70173.82368	70169.16917	70161.58021	70149.20214
123299.2683	123659.8754	124034.4972	124425.7924	124835.397	125265.2542
116717.3353	116878.6935	117048.1562	117223.1386	117401.7412	117584.5745
95335.9698	95530.42468	95728.99152	95930.76272	96131.30635	96328.28926
154651.1001	154923.3823	155186.0968	155441.5243	155688.7574	155927.4046
138535.8011	139143.1512	139751.1725	140357.7003	140965.0556	141571.6803
902994.1974	904561.1721	906147.8644	907759.1749	909389.7825	911042.5475
132115.8554	131922.0019	131720.6491	131514.2655	131300.7731	131079.8008
76091.72542	76323.93974	76563.07043	76811.73759	77071.37135	77343.28784
123956.9488	124053.5501	124148.943	124241.3041	124328.5986	124411.669
185795.7977	186109.9562	186428.1737	186752.0371	187078.753	187404.8395
243950.844	244867.4876	245801.461	246751.6378	247719.8168	248709.8518
141083.0261	141284.2366	141485.5672	141688.1929	141890.4697	142093.0987
1514661.475	1519912.634	1525265.111	1530716.575	1536247.103	1541847.253
142450.1332	142862.0375	143272.4765	143683.2727	144092.6136	144496.8216
128133.4657	128280.0107	128423.8397	128565.0529	128702.185	128835.5621
363693.0002	366958.9759	370298.8502	373716.7056	377217.3184	380806.4992
238041.5276	238481.9446	238944.7829	239431.1616	239935.5112	240454.9943
59180.18213	59218.80547	59254.04935	59287.06925	59312.72859	59332.13561
180754.0553	181026.5378	181296.4781	181558.1286	181812.0978	182056.5762
69491.6577	69433.29257	69374.43847	69313.70263	69252.15281	69183.97227
91896.3426	91991.04217	92087.00714	92182.46173	92272.78682	92356.17353
92787.46137	92931.02739	93070.45195	93208.8568	93341.28508	93468.38068
148233.6494	148728.9598	149242.737	149770.1635	150308.4241	150856.1379

2023	2024	2025	2026	2027	2028
3168550.827	3177157.652	3185467.165	3193399.552	3200884.218	3207927.249
708436.2789	709977.8316	711438.6865	712808.5856	714076.3106	715238.2739
70128.5343	70093.78383	70045.41149	69983.67476	69907.70707	69819.01046
125709.5245	126165.7495	126627.6734	127091.1963	127550.9687	128005.5271
117760.6471	117924.9834	118076.4969	118210.4297	118325.9229	118422.4225
96516.6282	96690.19192	96846.57975	96983.77722	97102.40356	97199.00684
156149.4075	156347.3011	156515.4501	156655.3606	156764.5216	156840.4396
142171.5372	142755.8218	143327.0748	143884.1469	144424.7868	144951.8675
912659.2186	914198.7611	915641.7243	916960.1645	918131.3876	919153.7896
130839.7775	130572.8837	130279.1693	129954.5528	129592.8739	129192.2604
77623.91624	77911.9966	78204.57211	78499.78675	78795.08914	79086.83394
124482.4384	124532.8752	124562.3859	124563.678	124537.0584	124486.6044
187719.8784	188015.093	188283.7321	188524.0139	188732.4351	188907.1131
249705.526	250696.4798	251677.1451	252638.8043	253573.6143	254484.8539
142287.682	142469.4328	142634.7197	142779.3286	142900.3168	142996.1239
1547455.33	1552981.06	1558386.755	1563630.802	1568676.52	1573535.185
144892.4216	145270.9103	145626.1746	145958.6759	146264.6396	146543.567
128958.1578	129067.3637	129163.1889	129240.1981	129294.5027	129324.6244
384464.7965	388171.8805	391914.8429	395679.3975	399451.1838	403226.6912
240976.9467	241486.4773	241977.4292	242441.4279	242877.6587	243289.0529
59342.71181	59343.33889	59332.24258	59307.62547	59269.23126	59219.96977
182286.78	182489.3711	182661.3059	182799.3174	182904.603	182976.7535
69108.67353	69021.55686	68921.56	68806.98575	68676.01741	68531.84527
92428.90674	92484.22977	92520.33335	92537.90968	92532.79457	92510.08985
93588.30241	93694.00518	93783.64309	93854.04716	93901.39206	93925.37107
151407.6327	151951.926	152486.0343	153005.2171	153504.4968	153987.2201

2029	2030	2031	2032	2033	2034
3214526.119	3220697.695	3226467.175	3231832.592	3236805.104	3241389.593
716298.5448	717258.4445	718128.1235	718907.3189	719601.8281	720214.903
69718.37148	69607.06237	69487.59969	69361.50131	69230.7794	69092.88508
128456.4301	128900.684	129338.1716	129767.874	130191.0254	130607.5552
118499.4313	118555.3184	118592.9158	118611.2313	118609.7379	118587.959
97274.65248	97333.12357	97375.88432	97400.9667	97414.05144	97414.61886
156884.9968	156899.0077	156880.4743	156833.5244	156759.974	156661.6152
145464.6626	145963.2485	146453.0778	146932.2213	147396.26	147850.2697
920029.3772	920756.2705	921345.2504	921794.2296	922101.2611	922262.2684
128755.3319	128282.0578	127770.4643	127221.792	126635.8755	126011.2355
79376.75091	79662.24255	79943.62824	80222.30495	80498.55582	80768.1561
124405.0797	124295.6303	124163.2972	124005.7087	123821.5057	123611.254
189049.4657	189160.2959	189243.0473	189295.4494	189317.0158	189308.7272
255374.4984	256238.6574	257078.385	257893.3383	258685.1777	259452.0668
143068.2507	143117.3866	143146.4284	143155.6363	143143.1307	143110.8287
1578198.197	1582682.98	1586993.801	1591131.044	1595102.015	1598912.422
146796.6485	147027.8695	147239.7434	147431.9127	147604.5592	147757.7184
129330.8097	129314.4096	129273.9665	129208.6801	129119.4924	129005.8835
407004.5369	410780.8029	414557.3402	418329.7957	422096.4864	425858.1719
243674.4613	244037.4845	244379.4103	244700.8618	245003.2929	245290.2374
59160.9394	59090.8114	59010.79372	58920.68406	58823.42008	58717.17001
183015.1385	183019.3326	182994.4977	182942.9344	182865.8681	182763.2268
68373.55925	68203.01805	68019.05005	67823.93714	67618.617	67404.62222
92462.69847	92399.25134	92317.98532	92220.99483	92109.16711	91986.05425
93924.81467	93899.50238	93847.10385	93765.97841	93657.27822	93519.73148
154454.5901	154910.4977	155353.9098	155785.2648	156203.8336	156609.6055

2035	2036	2037	2038	2039
3245613.502	3249512.444	3253097.114	3256412.417	3259522.028
720752.5023	721225.648	721634.3147	721992.7238	722316.5855
68950.11884	68803.00179	68654.06872	68501.70707	68348.41074
131014.0393	131415.7708	131809.3995	132198.442	132584.9577
118546.8215	118487.8393	118413.2124	118323.5922	118222.1266
97403.9584	97388.52487	97368.63594	97346.86056	97325.63048
156542.6455	156402.4594	156238.6449	156055.7564	155859.1659
148294.9188	148728.0518	149150.3532	149566.3656	149976.294
922288.68	922196.4588	921982.9474	921657.6408	921241.1244
125350.6024	124660.7321	123939.2001	123189.1036	122415.0569
81032.03644	81292.19382	81549.32266	81801.92687	82051.26323
123375.7818	123118.6539	122839.5569	122539.7897	122224.7216
189273.5374	189214.7284	189131.361	189026.3332	188902.2012
260194.1337	260913.5631	261611.2176	262286.1678	262943.6749
143062.5883	142996.5875	142912.2893	142814.3195	142704.2066
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245561.0418	245811.6116	246044.9466	246266.9277	246480.8142
58601.05744	58475.7004	58344.30236	58206.91018	58062.44293
182636.3476	182485.2142	182313.7165	182125.6326	181923.9781
67185.63549	66960.30319	66729.93895	66495.68996	66257.80126
91852.73073	91708.83289	91556.834	91396.03582	91229.49925
93356.00943	93166.0591	92950.00233	92710.86795	92451.96697
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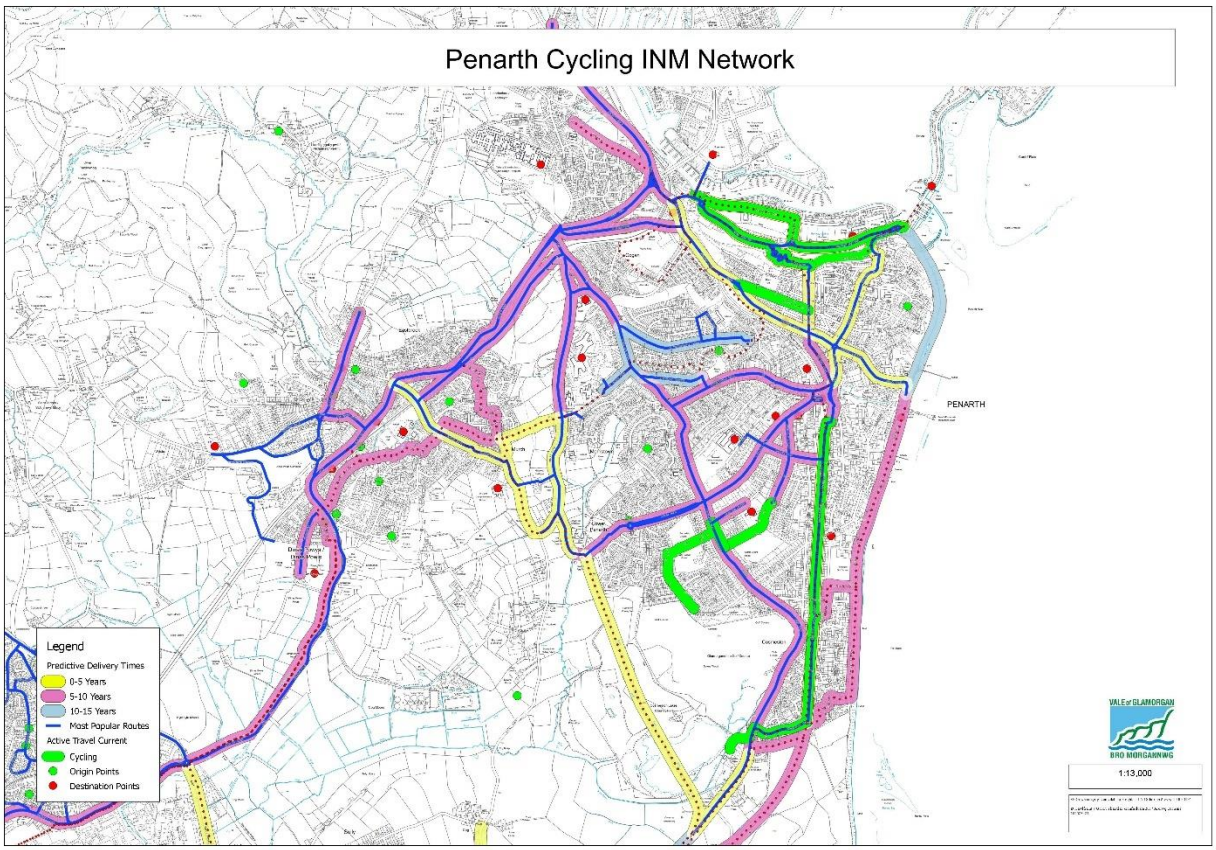
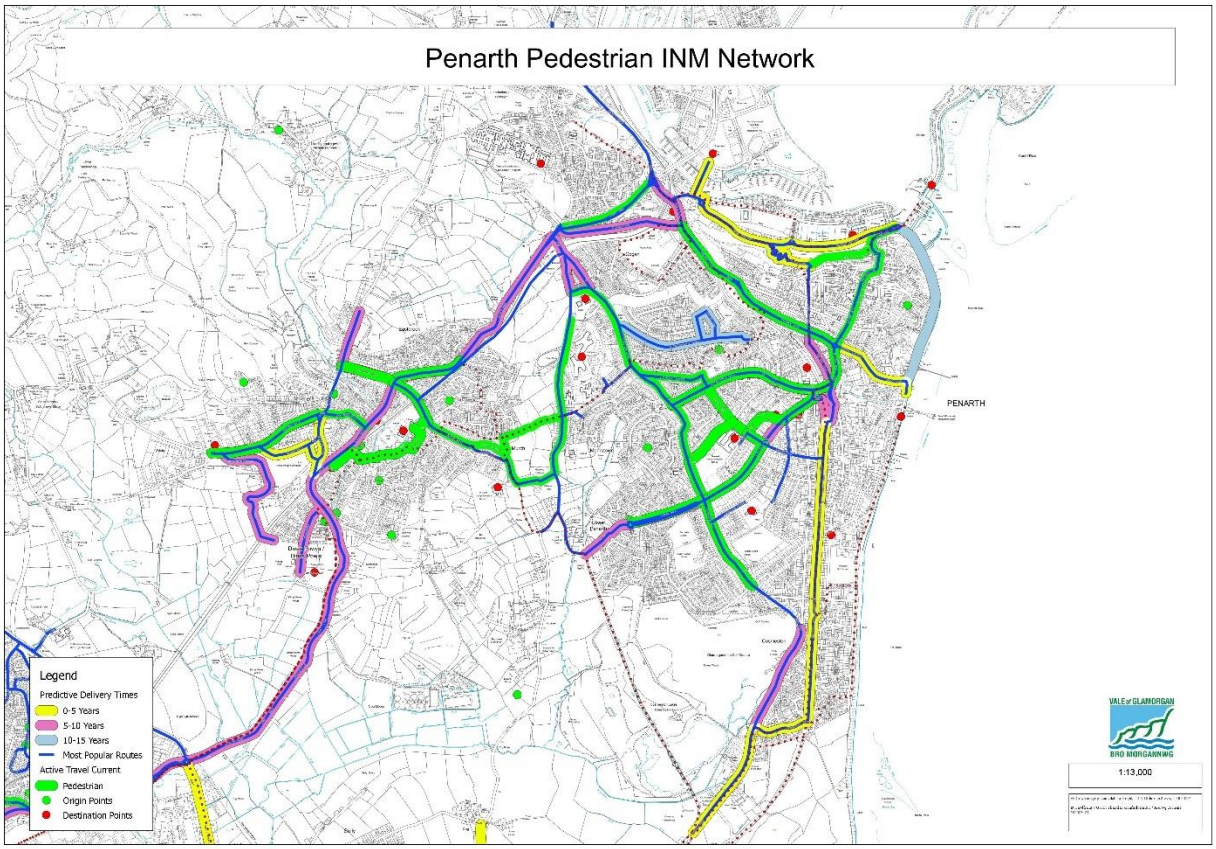
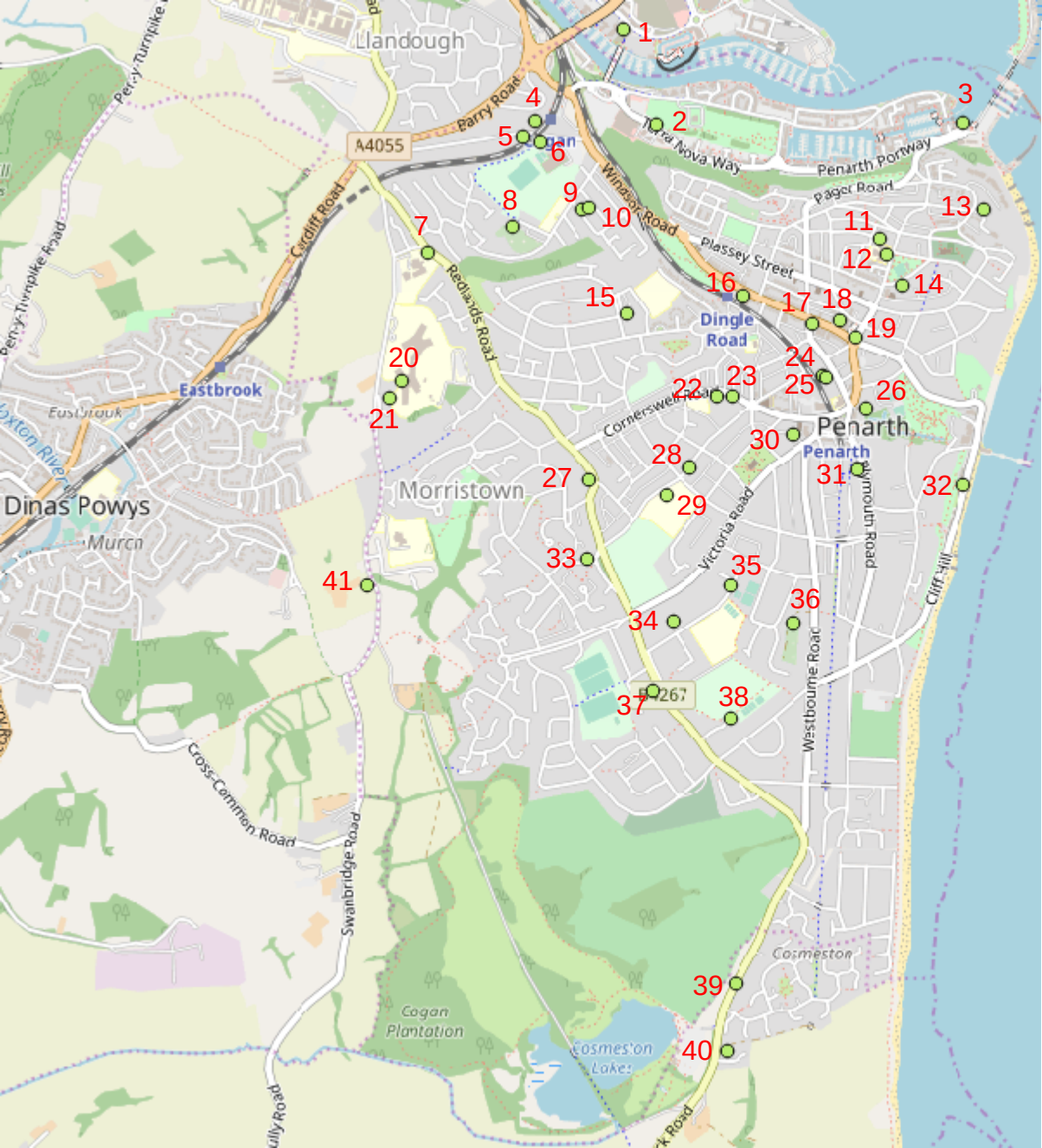
Appendix 5 Active Travel Integrated Network Maps of Penarth




Penarth Pedestrian INM Network
PENARTH
Legend
Predictive Delivery Times
0-5 Years
5-10 Years
10-15 Years
Most Popular Routes
Active Travel Current
Pedestrian
Origin Points
Destination Points
VALE of GLAMORGAN
BRO MORGANNWG
1:13,000

Appendix 6 Key Trip Attractors



Key Origins/Destinations

1 - Pont Y Werin
2 - Tesco, Cogan
3 - Cardiff Bay Barrage
4 - Cogan Railway Station
5 - Cogan Well-being Hub (Prop)
6 - Penarth Leisure Centre
7 - Ysgol Pen-y-Garth
8 - Cogan Primary School
9 - Local Centre (Pill St)
10 - Cogan Coronation Club
11 - Albert Primary School
12 - Albert Road Surgery
13 - Headlands School
14 - Nightingales Pre-School
15 - Fairfield Primary School
16 - Dingle Road Railway Station
17 - Town Centre (Windsor Rd)
18 - Windsor Rd Bus Stops
19 - Local Centre (Stanwell Rd)
20 - Ysgol Y Deri
21 - St Cyres School
22 - Victoria Primary School
23 - Local Centre (Victoria Rd)
24 - Bupa Dental Care, Penarth
25 - Westbourne School
26 - Penarth Lawn Tennis Club
27 - Redlands Surgery
28 - Penarth Health Partnership
29 - Stanwell School
30 - Paget Rooms
31 - Penarth Railway Station
32 - Penarth Pier Pavilion
33 - Local Centre (Redlands Rd)
34 - Evenlode Primary School
35 - Windsor Bowling Club
36 - Allotments
37 - Old Penarthians RFC
38 - Penarth RFC
39 - The G'shire Golf Club
40 - Cosmeston Lakes
41 - St Joseph's Primary School

Appendix 7 Penarth Headland Link - Existing Studies

List of studies completed to date in relation to the PHL proposal.

Penarth Headland Link Outline Economic Impact Assessment, Arup, November 2016

Penarth Headland Link Feasibility Report – Issued for the briefing of Consultants, Penarth Headland Link Group, February 2018

Penarth Headland Economic Impact study, Sustrans, April 2018

Vale of Glamorgan Council Penarth Headland Link – Stage 1 Maritime and Geotechnical Review, Arup, April 2018

Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup, October 2018

Vale of Glamorgan Council Penarth Headland Link – Environmental Planning Review, RSK, March 2019

Vale of Glamorgan Council Penarth Headland Link – Preliminary Ecological Assessment, Arcadis, 2019

Extracts from the following documents are also included below:

- Penarth Headland Link – Stage 1 Maritime and Geotechnical Review (Arup 2018)
- Penarth Headland Economic Impact Study (Sustrans 2018)
- Penarth Headland Link Environmental Planning Review (RSK 2019)

Vale of Glamorgan Council

Penarth Headland Link

Stage 1 Maritime and Geotechnical Review

Issue | 25 April 2018

Job number 260490-00

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ARUP

1 Executive summary

For the maritime assessment of the proposed structure (earth causeway with rock revetment) the alignment considered assumes approximately 20m offset from the cliff.

The design has been assessed to determine rock sizes required for the revetment and viable crest levels (based on overtopping criteria) compared to an initial outline proposal prepared by the Penarth Headland Group.

The initial proposed level of +8m OD is considered too low to provide safety to pedestrians from wave overtopping. Based on the existing data, an adequate level is estimated to be indicatively +9m OD. The exact level is to be decided after further studies considering risks and options and sensitivity to climate change.

By comparison this level is below the +9.7m OD 'as built' level at Cardiff Bay Barrage outer harbour breakwater, but higher than the +8.0m OD on the Parliamentary plans for the (unbuilt) Penarth Headland Link.

As another benchmark, the predicted 1:100 year flood level allowing for sea level rise but with no allowance for wave action is +8.5m OD.

The wave data available for this stage 1 study isn't sufficient to permit an assessment of the frequency that the causeway would have to be closed off as unsafe.

The rock armour on the causeway outer face appears reasonable for preliminary design, except that a toe of armour will be required.

Some issues that will require consideration in the next stage:

- Assess gaps and inconsistencies in the wave and water level data which is available for this stage 1 assessment.
- Operational restrictions: prevent access during storms.
- Potential for a parapet wall along the seaward edge of path to reduce wave overtopping.
- Allowance for sensitivity to increased storminess and sea level rise scenarios.
- Need for culverts through the causeway to prevent 'leaky dam'.
- Area between causeway and cliff likely to become silty, collecting rubbish and possibly becoming smelly.
- Need to consider escape options if overtopping or security concerns.
- Environmental and landscape impacts.

7 Further work

Based on the Stage 1 review presented above, the further maritime and geotechnical works required to progress the development of the Penarth Headland Link can be divided into two stages. Stage 2 being feasibility and scheme design and stage 3 being preparation of documentation for planning application and D&B tender.

The identified works are described below:

7.1 Stage 2

7.1.1 Objective

Feasibility and scheme design.

7.1.2 Scope

Scope as defined at end of Stage 1 to include:

- Review of Stage 1 outcomes and agree way forward; with client and key stakeholders
- Site visit by maritime engineers
- Acquisition of offshore wave data; Joint Probability Assessment of wave heights and water levels; numerical modelling to determine seastate conditions for detailed designs
- Assessment of impacts of the proposed scheme on coastal processes
- Consideration of tie-ins between mainland and causeway and the proposed area of reclaimed land to the north of the proposed causeway
- Detailed desk study (including geology, survey data and aerial photography) to review type and extent of historical instability
- Further assessment of rock fall hazards based on updated causeway alignment
- Review implications of changes I slope geometry due to degradation of the cliff and build-up of material at the base
- Outline geotechnical design of the causeway earthworks
- Integration of design and construction strategy with the constraints and opportunities identified by others (e.g. environmental)
- Pre-application consultations with maritime consenting authorities
- Input into EIA screening and scoping

7.1.3 Deliverables

- Feasibility report
- Scheme design drawings

7.2 Stage 3

7.2.1 Objective

- Documentation for planning application and D&B tender

7.2.2 Scope

- Support to EIA
- Support to stakeholder consultations

7.2.3 Deliverables

- Maritime and geotechnical engineering input into:
  - Planning applications
  - Employers Requirements & Reference Design for D&B construction

YMUNWCH Â'R MUDIAD

sustrans

JOIN THE MOVEMENT

Penarth Headland Economic Impact Study

April 2018

Circulation status:	Final draft – updated to address Sustrans Cymru feedback
Date issued:	13 April 2018
Authors:	Emma Lindsay with support from Elisabeth Muller and direction from Anjali Badloe and Ryland Jones
Quality assurance	Anjali Badloe 13 March 2018 and 13 April 2018
Sign-off	Louann Sugden (15.03.2018) Ryland Jones (16.03.2018)

About Sustrans

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Penarth Headland – Business Case

The following document provides an assessment of the economic benefits of developing a new walking and cycling route along the Penarth Headland in the Vale of Glamorgan, Wales.

The proposed route would run along the base of the cliffs at Penarth. The cliffs are crumbling, posing a considerable engineering challenge in stabilising them so that the route can be constructed on the shore below.
This document will inform the business case alongside a feasibility study of the proposed development that has been undertaken by the Vale of Glamorgan County Council.

1 Executive Summary

1.1 Economic benefits of the Penarth Headland Route

The economic benefits of the Penarth headland route have been appraised based on expected annual cyclist and pedestrian usage on the proposed shared use path after construction is completed. The economic benefits of this annual usage have been appraised as if observed for the next 20 years (i.e. a 20-year appraisal period has been used).

This analysis calculates baseline annual cycling and walking usage by local users before estimating usage on the constructed route based on uplift seen in previous infrastructure projects. The post-construction usage estimates have been developed using evidence from the Infrastructure Impact Tool (IIT), local data from past schemes in the surrounding area and other comparable sites. The post-construction usage scenarios include an estimated annual number of trips and are presented as low, middle and high scenarios.

Under the middle scenario, where the shared use route sees a 122% increase in cycling and 65% increase in walking trips above baseline:

- It is estimated that 759,156 cycling trips and 1,025,848 pedestrian trips could be occurring annually on the route.
- The economic benefits of the route development over a 20 year period are valued at £25,730,335, inclusive of £23,091,498 health-related economic benefits.
- The estimated tourism-related economic benefits of developing the route from pedestrian usage are valued at £8,063,365 per year with 178 FTE jobs directly and indirectly supported through this tourism.
- The Benefit-Cost Ratio (BCR) was calculated for the three usage scenarios. With total costs of the route estimated at £12,114,074 (including maintenance), all showed the route to have a positive economic impact: The Benefit-Cost Ratio (BCR) for the middle usage scenario was 2.12[1], where the economic benefits of constructing the route estimated to outweigh the costs. For comparison, the low usage scenario has an estimated BCR of 0.89 (where economic costs outweigh the benefits) and the high usage scenario BCR of 3.36.

[1] The average BCR of all schemes in the Connect2 active travel infrastructure programme is 6.3:1 The BCRs of individual schemes range greatly from 3:1 to 32.8:1.

Respondents of the Route User Intercept Surveys show overwhelming support for new route. When shown the proposed route on a map, 64% of respondents said they would always use the new route and 35% responded they would use it sometimes.

Vale of Glamorgan Council

Penarth Headland Link

Environmental Planning Review

662351

MARCH 2019

1 INTRODUCTION

RSK Environment Limited (RSK) has been commissioned by the Regeneration and Planning Department of the Vale of Glamorgan Council (the Council) to provide commentary based on a review of the relevant environmental legislative and regulatory framework applicable to the proposed development of the Penarth Headland Link (the Scheme).

The commentary is intended to inform the Council regarding the likely planning approach, including the consultation and approvals process, and the possible information and/or assessment requirements, so that the Council can plan, programme and budget for any studies that may be required, and compile a risk register covering required approvals and processes.

The scope of work is set out in a letter to RSK from the Council, which is provided at Appendix 1.

Disclaimer

The findings of the review that are provided in this report are restricted to those deemed relevant from an environmental planning perspective and are not intended to constitute legal or professional advice to be relied upon; that is to say, any findings in this report represent our professional opinion based the available evidence reviewed.

4 RECOMMENDATIONS

As requested by the Council, we include in this section a preliminary overview of the further work, particularly assessments, that we consider should be required by the Council in order to properly evaluate any future proposals. We provide an indication of the likely timeframe to be allowed for the work and an indication of the likely scope of any studies. It should be borne in mind that this is not comprehensive since the scope of work will be dictated by the actual scale and nature of the proposals. Also, should any surveys be necessary, as is likely, then seasonal and other constraints should be borne in mind as they would probably influence the timing of such work.

4.1 Further studies and assessments

4.1.1 EIA and WFD assessment

As noted in section 3.2 an EIA will need to be undertaken, and an Environmental Statement and WFD assessment report submitted for approval by the relevant authorities. We assume that one EIA covering all relevant marine, intertidal and land-based activities would be compiled. Once project details have been confirmed then the EIA should be thoroughly scoped in discussion with NRW, the Council and its advisors. A preliminary contents list for the EIA may comprise the following:

- Physical processes including coastal morphology and hydrodynamics; sediment dynamics; wave conditions and tidal flows
- Marine navigation including impact on shipping and navigational safety and risk of major accidents and hazards such as ship collision
- Impact on designated sites including information to support a Habitats Regulations Assessment
- Marine benthos, both subtidal and intertidal
- Marine fisheries and shellfisheries
- Water resources and WFD assessment
- Ornithology including seabirds and terrestrial species
- Impact of climate change including sea level rise, storm incidence, flood and coastal erosion and flood consequences assessment
- Noise possibly including underwater noise
- Air quality including emissions
- Landscape and seascape including lighting
- Tourism and recreation
- Socioeconomics including impacts on human health
- Cultural heritage including underwater archaeology
- (possibly) land and seabed conditions including contamination

- (possibly) waste generation and materials or resources usage
- Cumulative and in-combination effects

In addition, the Environmental Statement should also include a draft Construction Environmental Management Plan (CEMP) that should cover pollution control and incident response planning, a lighting plan, transport management plan (including a public access / safety plan regarding impact on the users of the existing Wales Coast Path, where affected), site waste management plan, archaeological method statements (if necessary), and any other site-specific management plans required to control construction stage adverse environmental effects. In addition, NRW may consider the need for a monitoring plan, which may be required to inform any adaptive management plan that is required to mitigate effects that are uncertain at the time of issuing the licence or consent.

Further information may be found in Guidance note: GN13, *Scoping an Environmental Impact Assessment for Marine Developments; Guidance for developers and NRW staff* (NRW, August 2017)

We cannot be prescriptive about the information needs for the EIA in this short review, since that will depend on the extent, quality, and validity/currency of the available baseline information, the scale and nature of the project proposals when confirmed, as well as the views of the statutory authorities and their consultees during the EIA scoping stage. However, for a project of this nature where there is proposed to be a major change in the form of the coastline, there is likely to be an intensive need for data on marine and coastal dynamics, which could necessitate collection of data on tidal flows and sea heights to be used in dynamic models. There is also likely to be a need for surveys of marine biota and census of seabird colonies and shoreline usage by feeding and breeding birds amongst other things (both summertime breeding bird surveys and wintering/migratory bird surveys would be required). Other aspects of the assessment may be able to rely on desktop studies of available information.

4.1.2 HRA to inform an AA

An HRA would need to be carried out, due to the presence of European/international sites. The need for Appropriate Assessment would be established through an initial screening stage (Test of Likely Significant Effects (TLSE)). HRA is carried out by a 'competent authority', in this case NRW, though details of the works and information to enable the assessment, would need to be provided by the developer.

4.1.3 Marine Licence application

An application on the requisite form for a Marine Licence would be made to NRW. The application would be for "Marine Works [which] include, but are not limited to coast defences, beneficial uses of dredged materials, subsea cables, pontoons, jetties, ground investigations, land reclamation, and outfall pipes". The completed application form would need to be accompanied by a location plan and descriptive drawings and the supporting environmental assessments, including Environmental Statement and WFD assessment report.

It is presumed at this stage that dredging and disposal is not required, as this has additional requirements for documentation to be provided.

Applications are subject to a prescribed fee.

4.1.4 Other consents and permits

It has been noted in section 3.6 that certain other consents and permits may be required prior to commencement of the works. This may include a Flood Risk Activity Permit, CPA consent, and consent to work in a SSSI. It is assumed that these will be applied for and determined following completion of the EIA and Marine Licence applications, during the detailed design stage and immediately prior to construction.

4.2 Indicative timeline

In this section we provide an indication, in outline only, of the likely timeframe required to complete the various items of work identified in section 4.1, based on our experience of other similar major projects. It should be noted that this estimate is only 'ballpark' for initial planning purposes and should not be relied upon for other purposes such as resource planning.

To undertake an EIA of the scale and complexity envisaged would require a year, within which it should also be possible to plan and complete the various surveys envisaged to be necessary, provided that multi-year surveys are not deemed to be necessary. This would include scoping and assessment stages, presuming that work on the EIA would be commenced pending any formal screening opinion. A further period should be allowed for approval of the EIA.

Presuming that the application for a Marine Licence could be prepared and submitted during the preparation of the EIA, then an additional 6 months approximately should be allowed for NRW to process and consult on the application and to draft the licence. It should be noted that separate Marine Licences may be required for certain types of survey and investigations, for instance should there be a need to undertake marine borehole investigation to support the design of the causeway. This has not been allowed for in this timeline.

Approvals for the various other consents required have certain timeframes associated with each application and although not explicitly included in the above timeline, adequate time should be allowed for. As an example, the current service level agreement time periods provided by NRW are:

- SSSI consent – 4 months
- EPS licence – 30 days
- FRAP – 2 months.

Appendix 8 Active Travel Review of Proposed Routes

Active Travel INM – Penarth Cardiff Barrage Corridor

Review of Proposed Routes

Introduction

The Vale of Glamorgan's Active Travel INM includes a number of Active Travel schemes within the Penarth area. The INM proposals within the Penarth area have varying degrees of benefit for the Penarth Cardiff Barrage Corridor under consideration by this WelTAG study. A review has been undertaken that considered all the Penarth INM improvements and identified the most appropriate links to maximise active travel journeys along the Penarth Cardiff Barrage corridor. The review has considered key destinations along the corridor (e.g. Penarth town centre, Cardiff Barrage, schools, leisure centres etc.) to ensure linkages are made to key services and facilities. The review has also aimed to provide connections to the main residential areas within the study area and to existing Active Travel routes. The result of this review is a package of Active Travel improvements that are thought to be of most benefit to the corridor. The links that will form a package of Active Travel improvements to be assessed by the WelTAG Stage Two are shown in Figure 1 of this Appendix and each link is considered in detail in the following tables.

The assessment below is based on a desktop review of each of the Active Travel route proposals. Other than the Penarth Headland Link, no feasibility work has previously been undertaken on any of the routes being considered by WelTAG Stage Two. As such, the focus of the desktop review has been on those routes other than the PHL, as these have no previous feasibility work available.

The assessment of links below has focused on the route alignment as included in the INM. No assessment has been undertaken of potential alternative alignments, but comments have been included where an alternative alignment is considered worthy of future review.

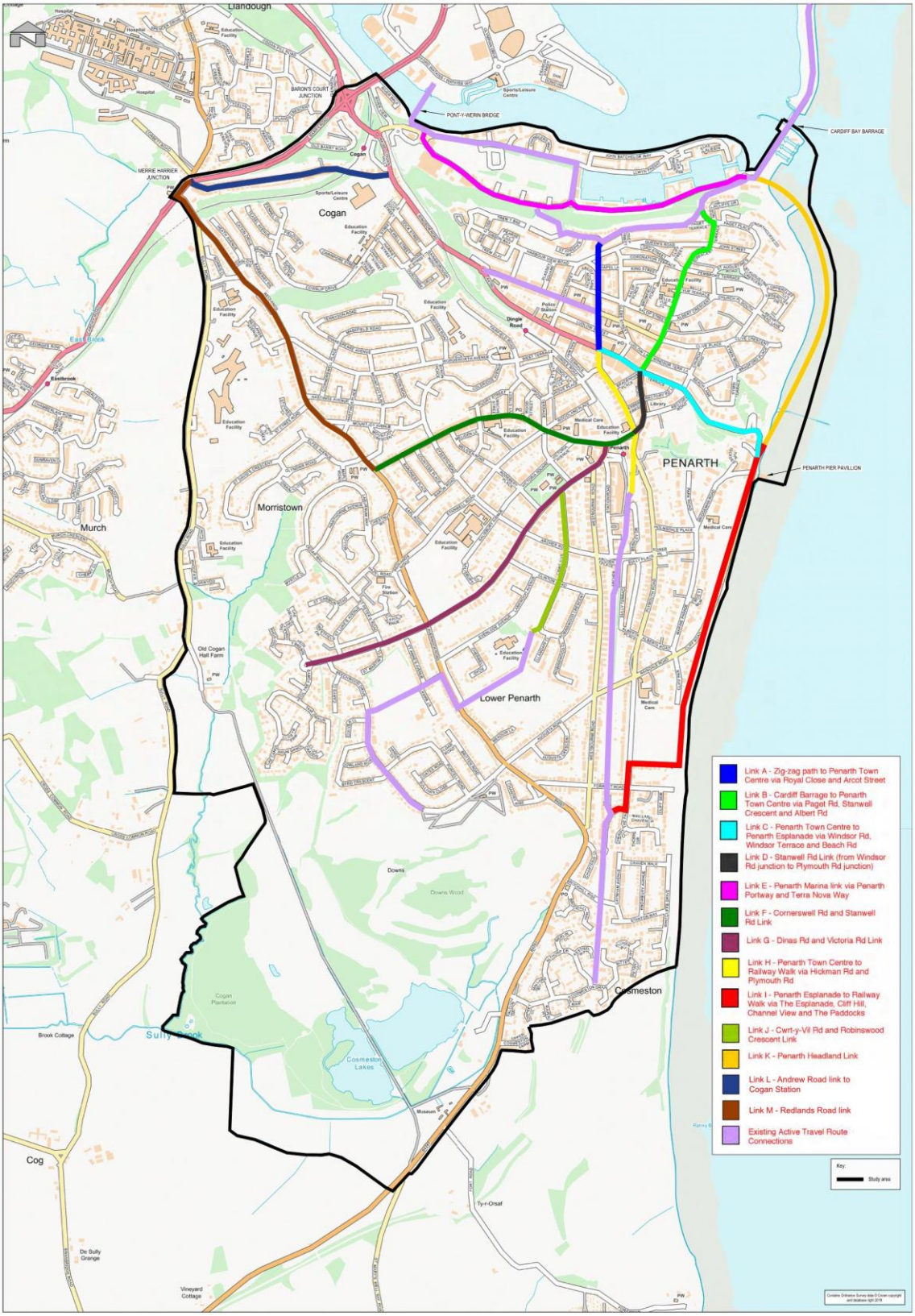


Figure 1 – Active Travel INM proposals for the Penarth Cardiff Barrage Corridor

Link A – Link from zig-zag path to Penarth Town Centre via Royal Close and Arcot Street

INM reference number	VALE-PROP-PN-C280
Existing information available	Included in INM as a 0-5 year cycling scheme. Not included in the ERM or INM as a pedestrian scheme. Not included in Sustrans' INM audit work. Cycle infrastructure has previously been put in place along the link e.g. a contraflow cycle lane along a section of Arcot Street.
Existing route characteristics, observations and constraints	This route provides a link between the Zig-Zag Path (existing Active Travel route) towards Penarth Town Centre past the new Penarth Heights development. The route also provides an alternative route for those travelling to/from the Barrage to the Town Centre via Paget Road, avoiding the more direct, but steeper, hill on Stanwell Crescent (refer to separate audit for both Paget Road – Albert Road link (Link B)). The route connects into other proposed routes at the junction of Windsor Road and Hickman Road. As a main connecting route between connections across the River Ely into Cardiff and the proposed routes to the south, improvements to this link are viewed to be a priority. North-south description of route from Royal Close in the north to Windsor Road in the south. **Royal Close:** Zig Zag path links onto cul-de-sac, Royal Close. Seating available after incline (Zig Zag Path). Street lighting and footway available on Royal Close. Slight incline (if travelling towards Penarth Town). Evidence of NCN signposts away from Penarth Town. No evidence towards Penarth Town (at junction of Royal Close/Paget Road). The Royal Close section forms part of an existing Active Travel cycle route (on road, not segregated). **Paget Road:** Directional signs for Active Travel modes at junction of Paget Road and Queen's Road. Public realm area with trees, but no resting facilities. The section of Paget Road between the Royal Close junction eastwards towards Paget Terrace/ Cardiff Barrage is an existing Active Travel cycle route (on road, not segregated). The section of Paget Road between the Royal Close junction southwards toward the Queen's Road junction is a proposed Active Travel route. **Queen's Road:** Cyclists would need to cross Queen's Road to continue onto Arcot Street. Evidence of parked cars on Southern side of Queen's Road may obstruct visibility for pedestrians wishing to cross. Bollards close to dropped kerbs on southern side of Queen's Road reduces likelihood of unsuitable parking. Lack of dropped kerb on western side of Paget Road – Arcot Street crossing (most likely side of road for those travelling from Royal Close towards town as

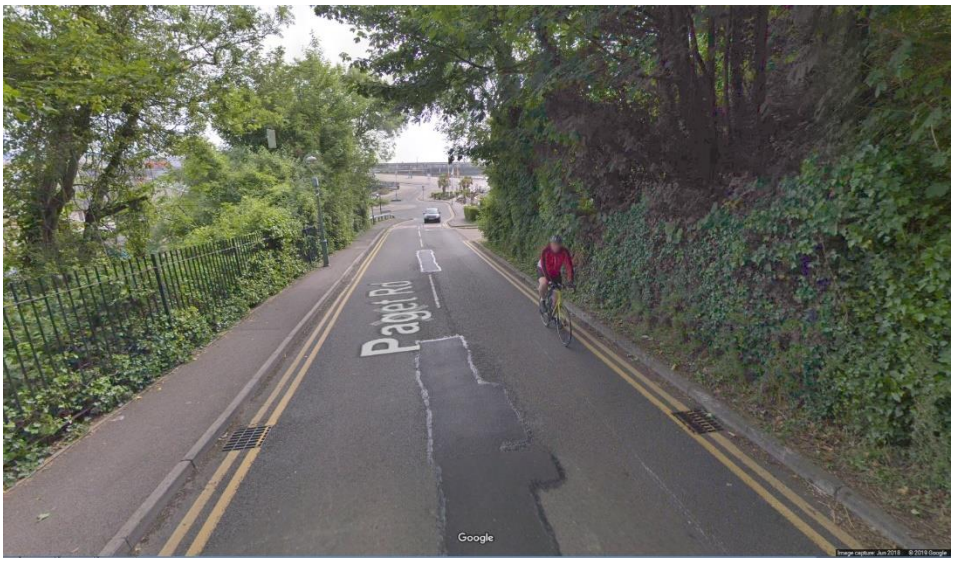
	avoids need to cross Paget Road), though crossing on the eastern side does avoid a further crossing along Arcot Street.  **Arcot Street (Queens Road – Plassey Street Section):** Evidence of cycle awareness road markings. Parking along both sides of Arcot Street – cycle markings close to parking areas may encourage cyclists to ride in 'door zone'. Junctions of side roads previously extended into Arcot Street to provide better visibility. **Arcot Street (Plassey Street – Windsor Road Section):** Link into existing (southerly) cycle lanes on Plassey Street and contra-flow cycle gate to continue on Arcot Street. Good visibility when crossing Plassey Street onto the one-way section of Arcot Street. Evidence of vehicles parking over designations may encourage vehicles travelling northbound to travel within the southbound contra-flow cycle lane due to reduced width of northbound lane.  No dropped kerbs provided for those wishing to cross Windsor Road (at southern end of route section) to continue along Hickman Road. Evidence of cyclists using street furniture to park bicycles shows potential need for cycle parking facilities at this location.

	 Close proximity of Windsor Road parking bay to junction with Arcot Street reduces visibility of cyclists crossing to Hickman Road or turning right onto Windsor Road, and to pedestrians wishing to cross onto Hickman Road. A-Board advertising on footway at junction of Windsor Road and Arcot Street. 
Length of route	0.4km
Origins and destinations connected by link	Provides a link between Penarth Town Centre and the zig-zag path along a route with less topographical challenges than proposed Stanwell Crescent/Albert Road.

	Provides links to the wider network e.g. links to Pont-y-Werin bridge and towards Penarth Marina for journeys across the Barrage.
Potential improvements along link	Royal Close would benefit from increased reminders of likelihood of cyclists/pedestrians using road. Increased route signage, particularly if travelling towards Penarth Town. Need to ensure any additional signage provided along link does not conflict/ duplicate existing directional signage. Dropped kerb crossing provision at Queens Road junction with Arcot Street on Western side. Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. Consideration should be given to the junction crossing points and whether any measures could be put in place for cyclists e.g. use of parking restrictions to improve visibility. On-road cyclist markings should be considered to mark the route as a cycle route. Awareness markings for cyclists when travelling south-north along Arcot Street (contraflow north-south well marked). Cycle parking at location close to junction with Windsor Road. Measures to improve the crossing of Windsor Road at southern end of Arcot Street for pedestrians and cyclists e.g. building out the junction to reduce carriageway width if feasible. Set-back of parking bays from Arcot Street junction on Windsor Road. Potential to introduce a 20mph limit within the town centre to reduce traffic speeds and improve the town centre environment for pedestrians and cyclists – a reduction in traffic speeds would benefit the crossing of Windsor Road.
Known interdependencies	Directly links into other proposed links i.e. Links C and H. Consideration needed of how the proposed links join up at the Windsor Road/ Arcot Street junction. Links into the wider existing network e.g. along Plassey Street, Paget Road and the zig-zag path. Greatest benefit will be achieved if this link is delivered in conjunction with other active travel proposals within the town centre to enable cyclists to safely negotiate the town centre environment and continue onto the wider network.
Land issues	No land issues identified as majority of proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified for the proposed improvements that are within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in built-up, residential/ town centre streets will have traffic management implications, particularly depending on the extent of the works undertaken within the town centre. TROs would be required for the introduction of a 20mph limit and any parking restrictions near junctions.

	Evidence of footway/indiscriminate/ illegal parking that could create difficulties for pedestrians and cyclists – will need to be considered during design of proposal, also need for enforcement.

Link B – Link from Cardiff Barrage to Penarth Town Centre via Paget Road, Stanwell Crescent and Albert Road

INM reference number	VALE-PROP-PN-C270
Existing information available	Included in the ERM as an existing pedestrian route. Included in INM as a 0-5 year cycling scheme – proposed improvements focus on improving the link for cyclists. Included in Sustrans' audit work (score of 71 for pedestrians and 63 for cyclists). Comments about route available in audit report. Comment received from Sustrans that 'people tend to avoid Albert Road because it goes to the highest point and when going north people are more likely to use Arcot Street or Glebe Street.' NB. Glebe Street not included in INM. Arcot Street route included as Link B below.
Existing route characteristics, observations and constraints	North-south description of route from Paget Road in the north to Windsor Road/ Albert Road roundabout in the south. **Paget Road:** Link travels along existing ERM route on Paget Road. Steep gradient at northern (barrage) end of Paget Road. Some on-road cycle markings in vicinity of road humps. Street lighting along length. Uphill (north-south) cycle route diverts up a one-way street (un-named) with a steep gradient - cycle lane/ segregation in place on the junction. Cyclists travelling south-north would need to following road network along Paget Road due to one-way traffic. 

Paget Road/Maughan Terrace:
At junction cyclists would need to turn left and travel briefly along Paget Road before turning right onto Maughan Terrace.
Junction requires stopping on the incline and giving way to traffic travelling along Paget Road.

Both are wide residential streets with evidence of on-highway parallel parking on both sides.

	Road surface needs review as evidence of poor surface that could create difficulties for cyclists.  At the southern end of Maughan Terrace, the active travel route would need to cross John Street before travelling along Stanwell Crescent. Parking in the vicinity of junction would impact on visibility when crossing the road at this point. **Stanwell Crescent:** Stanwell Crescent has a steep gradient and is a relatively narrow, terraced street. There is limited scope for any on-road cycling improvements due to the road width and parking on both sides of the road.  At the southern end cyclists would need to cross Pembroke Terrace onto Albert Road. Parking near the junction and the road layout could impact on visibility when crossing the road at this point.

Albert Road:

Albert Road is a 20mph zone in the vicinity of Albert Primary School with a gateway feature at the Stanwell Road and Albert Crescent junctions and road humps along the length.

There is evidence of roadside parking on both sides of the road on the approach to the school but there are parking restrictions/no parking in the vicinity of the school.

Beyond the 20mph zone the road leads into the town centre – the road widens, evidence of parking on both sides along with short stay parking bays on the approach to the town centre.

It is assumed that there are periods of high levels of pedestrian activity on the footways around the school and towards the town centre at certain times. Opportunities to increase the visibility/awareness of cyclists where feasible to increase awareness of an active travel route within the town centre environment.

	Windsor Road/ Stanwell Road Roundabout could be difficult to negotiate for less-experienced cyclists particularly at busier periods.  Evidence of directional signage already in place on approach to town centre. 
Length of route	0.71km
Origins and destinations connected by link	Provides a direct link from Cardiff Barrage to the town centre although the steep gradient of some sections of the link may be a problem for some users and because of this an alternative route is also considered (refer to Link B). Also provides a direct link to Albert Primary School from nearby residential areas.
Potential improvements along link	No improvements proposed to existing active travel route along Paget Road but need to ensure continuous signage along length of route. Need to ensure any additional signage provided along link does not conflict/ duplicate existing directional signage.

	Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. Link along Paget Road and Maughan Terrace will have very similar characteristics to the existing active travel route along Paget Road so a similar level of cycle provision is proposed i.e. on-road, not segregated. Potential need for improvements to road surface. On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings on busier sections/ on approach to junctions in the town centre if there is sufficient width. Consideration should be given to the junction crossing points and whether any measures could be put in place for cyclists e.g. use of road markings or parking restrictions to narrow the crossing points and improve visibility. Potential to introduce a 20mph limit on the busier section of the link within the town centre to reduce traffic speeds and improve the town centre environment for pedestrians and cyclists.
Known interdependencies	Directly links into other proposed links i.e. Links C, D, E and K. Link B has the potential to be delivered as a quick win improvement but is not considered to be a high priority due to the alternative link available along Arcot Street (refer to Link A). Both east-west and north-south routes within the INM require cyclists and pedestrians to cross Windsor Road/ Stanwell Road Roundabout – any improvements to the roundabout will need to accommodate active travel measures on all arms of the roundabout. Greatest benefit will be achieved if this link is delivered in conjunction with other active travel proposals within the town centre to enable cyclists to safely negotiate the town centre environment and continue onto the wider network.
Land issues	No land issues identified as proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified for the proposed improvements that are within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in built-up, residential/ town centre streets will have traffic management implications, particularly depending on the extent of the works undertaken within the town centre. TROs would be required for the introduction of a 20mph limit and any parking restrictions near junctions.

Link C – Link from Penarth Town Centre to Penarth Esplanade via Windsor Road, Windsor Terrace and Beach Road

INM reference number	VALE-PROP-PN-C390
Existing information available	Included in INM as a 0-5 year cycling scheme. Windsor Terrace/ Beach Road section included in INM as a 0-5 years pedestrian scheme. Windsor Road section included in ERM as an existing pedestrian route. Not included in Sustrans' INM audit work.
Existing route characteristics, observations and constraints	This proposed route connects the Town Centre with the Esplanade and links into a number of other proposed routes. The route is very steep and at points there is little frontage development onto the route. Other constraints include the lack of footway on the northern side of Beach Road. Pedestrians are encouraged via existing signage to use routes through Alexandra Park instead of via Beach Road. West-east description of route from Windsor Road/ Hickman Road Junction in the west to the Esplanade in the east. **Windsor Road:** Link connects to Links A and H at junction of Hickman Road and Arcot Street. No pedestrian crossing facility at junction (across Windsor Road) between Arcot Street and Hickman Rd. Parallel Parking both sides of road, short stay limited provision between 8am and 6pm (max stay 1 hour).  Shops and restaurants on either side of road. Likely high number of pedestrians crossing road (x2 zebra crossing are located along the route, one 66m from junction with Hickman Road and another 140m from junction with Hickman Road). Evidence of illegal parking close to crossing (adjacent to Boots Pharmacy), perhaps evidence of demand for loading provision. Evidence of other unofficial loading arrangements in place close to establishments along Windsor Road.

Cycle parking (x8 stands) available on footway next to Nationwide Building Society.
Loading Bay on northern side of Windsor Road (space for x2 medium sized vans) and disabled parking bays on Southern side (space for x4 cars). Bus stop on northern side of route for services in direction of Barry.
Road narrows beyond this point for zebra crossing and joins roundabout (junction with Windsor Terrace).

Windsor Terrace:
Link connects to Links B and D at the Windsor Road/ Stanwell Road roundabout, which could be difficult to negotiate for less-experienced cyclists particularly at busier periods.
Cycle parking available at the top of Windsor Terrace.
Wide carriageway with parallel parking bays either side.
Street lighting along Windsor Terrace.
Crossing refuge provided close to Rectory Road junction, though only 1 side with dropped kerb.

Beach Road:

Steep gradient and parking restrictions along length of Beach Road. (Would need to consider speed of cyclists downhill on a shared use route and uphill if on-road.)

Directional signpost at Rectory Road junction encourages pedestrians to use Alexandra Park rather than Beach Road.

Route through Alexandra Park not appropriate link for cyclists – steps along route.

Footway stops on northern side of road close to Rectory Road junction.

Continuous footway on southern side.

Vegetation lined street with no direct active frontages.

Resting facility (bench) provided halfway up hill on southern side of road.

Footpath on Northern side (link with Kymin Terrace) emerges onto blind bend as footway re-starts on northern side.

	Carriageway markings have been used to narrow carriageway on bends – suggests there would be potential reduce carriageway width/ widen footway if required. Cycle parking facilities close to pier on Esplanade. Lack of directional signage at the Esplanade of routes into Town Centre, as well as notification of footway gap on the Northern side for those travelling from Esplanade to Town. Resting and refreshment provision at Esplanade. Steep gradient for those travelling from Esplanade into Town Centre. Attractive more direct walking route through Alexandra Park likely to encourage pedestrians.
Length of route	0.8km
Origins and destinations connected by link	Direct link from Penarth town centre to Penarth Esplanade (and proposed Penarth Headland link) although the steep gradient may be a problem for some users.
Potential improvements along link	It is considered that there is limited scope for dedicated cycling infrastructure within the town centre environment (Windsor Road) due to traffic movements, on-street parking and space constraints. Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. (Potentially scope to provide a shared-use link along Beach Road but not currently proposed due to the gradient of the link). On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings on busier sections if there is sufficient width e.g. on approach to Windsor Road/ Stanwell Road roundabout. Provide dropped kerb on northern side of road at current crossing (close to junction of Rectory Road). Active travel signage required throughout but ensure does not conflict/ duplicate existing directional signage (including awareness of footway ending on Northern side of Beach Road close to suitable crossing point). Potential to introduce a 20mph limit within the town centre to reduce traffic speeds and improve the town centre environment for pedestrians and cyclists.
Known interdependencies	Directly links into a number of other proposed links i.e. Links A, B, D, H, I and K. Both east-west and north-south routes within the INM require cyclists and pedestrians to cross Windsor Road/ Stanwell Road Roundabout – any improvements to the roundabout will need to accommodate active travel measures on all arms of the roundabout. Greatest benefit will be achieved if this link is delivered in conjunction with other active travel proposals within the town centre to enable cyclists to safely negotiate the town centre environment and continue onto the wider network. Along a regular bus route.
Land issues	No land issues identified as proposed improvements would be within the highway boundary.

Environmental issues	No environmental issues identified as proposed improvements are within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in built-up, residential/ town centre streets will have traffic management implications, particularly depending on the extent of the works undertaken within the town centre. TROs would be required for the introduction of a 20mph limit.

Link D – Penarth Town Centre link along Stanwell Road (from Windsor Road junction to Plymouth Road junction)

INM reference number	VALE-PROP-PEN-C290
Existing information available	Included in INM as a 0-5 year cycling scheme. Included in ERM as an existing pedestrian route. Not included in Sustrans' INM audit work. Stakeholder comment that the traffic lights at the Stanwell Road/ Plymouth Road/ Hickman Road junction are a very big issue to overcome.
Existing route characteristics, observations and constraints	North-South description of link from junction with Windsor Road/Stanwell Road roundabout to signalised junction with Plymouth Road/Hickman Road. **Stanwell Road:** Five-arm roundabout access onto Stanwell Road, with zebra crossings on 4 of 5 arms. Parallel parking on western side of Stanwell Road. Parking restrictions along eastern side. Constrained town centre environment with retail properties on both sides of the road.  Private parking access over footway to rear of property (currently occupied by bank), which requires reversing over pavement for access or egress. Bus stop (for services towards Barry) located on eastern side of road. Resting facility available on western side of road, close to junction with Herbert Terrace. Cycle parking available on western side of road, close to junction with Herbert Terrace (x2 stands). Parallel parking on both sides of Stanwell Road beyond junction with Herbert Terrace, including 2 disabled bays. Narrow two-way carriageway along length.

	Active frontages with seating areas and shops on eastern side of road between Herbert Terrace and junction with Hickman Road. It is assumed that there are periods of high levels of pedestrian activity on the footways in the retail areas at certain times.  Cycle parking on western side of road close to newsagents (x2 cycle stands). Short southbound cycle lane on approach to traffic light junction, leading to Advanced Stop Line. Signal controlled junction with Plymouth Road and Hickman Road at south of link could be difficult to negotiate for less confident cyclists.
Length of route	0.22km
Origins and destinations connected by link	Connecting route within the town centre. Connects town centre shops and services (including the library) along Stanwell Road.
Potential improvements along link	It is considered that there is limited scope for dedicated cycling infrastructure within the town centre environment (along Stanwell Road) due to traffic movements, on-street parking and space constraints. Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings if there is sufficient width e.g. on approach to junctions. Active travel signage required throughout but ensure does not conflict/ duplicate existing directional signage. Potential to introduce a 20mph limit within the town centre to reduce traffic speeds and improve the town centre environment for pedestrians and cyclists. Potential to improve the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled junction for pedestrians and cyclists.

Known interdependencies	Directly links into a number of other proposed links i.e. Links A, C, F, and H. Both east-west and north-south routes within the INM require cyclists and pedestrians to cross Windsor Road/ Stanwell Road Roundabout – any improvements to the roundabout will need to accommodate active travel measures on all arms of the roundabout. Routes within the INM require cyclists and pedestrians to cross all arms of the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled crossing – any improvements to the junction will need to accommodate active travel measures on all arms. Greatest benefit will be achieved if this link is delivered in conjunction with other active travel proposals within the town centre to enable cyclists to safely negotiate the town centre environment and continue onto the wider network. Along a regular bus route.
Land issues	No land issues identified as proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified as proposed improvements are within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in built-up, residential/ town centre streets will have traffic management implications, particularly depending on the extent of the works undertaken within the town centre. TROs would be required for the introduction of a 20mph limit. Bus route (for services travelling north-south along road towards Barry from Windsor Terrace Junction to Hickman Road Junction, for services travelling south-north from Hickman Road junction to Rectory Road junction).

Link E – Penarth Marina Link along Penarth Portway and Terra Nova Way

INM reference number	VALE-PROP-PEN-P0020 and VALE-PEN-C0030
Existing information available	Included in INM as a 0-5 year pedestrian scheme. Included in the ERM as an existing cycle route. Stakeholder comment that previous feedback from users has indicated more signage is required along the marina and that the existing road humps cause problems for cyclists. Comment from public consultation event that cyclists do not adhere to roundabout at eastern end of link. Not included in Sustrans' INM audit work.
Existing route characteristics, observations and constraints	This route connects the end of the Cardiff Bay Barrage (and northern end of Paget Road) along Penarth Marina to the Pont-y-Werin bridge, crossing the River Ely between Cogan and the International Sports Village. There is anecdotal evidence of rat-running of motor traffic along route, particularly in AM peak to avoid queuing traffic along the A4160 Windsor Road (as priority is given at Cogan roundabout to those travelling via this route). Flat route, well used by cyclists and pedestrians completing the Bay Trail Loop. West-east description of link from Cardiff Barrage to Pont-y-Werin. **Penarth Portway (Barrage – Penarth Portway/ Terra Nova Way roundabout):** Footways on either side of roundabout, though no dedicated crossing facilities at this point (crossing opportunity available slightly off roundabout along Penarth Portway across raised traffic calming feature). Cycle signage to raise awareness of likelihood of cyclists along route. Footway on northern side of road (not on southern side). 

	Bay parking along northern side (between road and footway) at angle.  Traffic calming measures continue along route – combination of road humps and flat top features across junctions. Evidence of some traffic calming features requiring maintenance. Lighting along route, residential frontages along much of northern side of road. Narrow footways in part. Evidence of heavy vehicles manoeuvring to/from boatyard on southern side of road. No directional signage along route. **Terra Nova Way (Penarth Portway/ Terra Nova Way roundabout – Tesco roundabout):** Narrow cycle lane markings provided on one arm of roundabout (limited). Section of off-road, shared-use route provide in a westerly direction across the roundabout (only benefits cyclists travelling in a east-west directly). Cycle lane continues on-road (marked cycle lane) beyond roundabout. Marked cycle lane also provided on-road in a west-east direction but stops on approach to roundabout. Marked cycle lanes provided in both directions along length of Terra Nova Way (including coloured surfacing where cycle lane crosses side road junctions), ending on approaches to roundabouts in both directions. Link into zig-zag path provided along Terra Nova Way. No evidence of roadside parking along length of Terra Nova Way. Cycle parking available on southern side at Tesco store. Large radii of side junctions, particularly on southern side, may cause problems for pedestrians. Off-road shared use route provided on approach to Tesco roundabout to provide an off-road link (and avoids the roundabout) for pedestrians and cyclists. Traffic calming measure (raised table, forms part of shared-use route) at crossing point close to roundabout. Off-road, shared-use link crosses Marconi Avenue arm of roundabout and divides into separate off-road pedestrian and cycle links to Pont-y-Werin. Steep incline on approach to bridge via cycle route, not as steep via footway. Tactile paving and central refuges provided at roundabout if crossing to supermarket, as well as cycle parking, though narrow cycle lanes on roundabout arms may encourage overtaking.

Length of route	1.3km
Origins and destinations connected by link	Existing Active Travel network e.g. Pont-y-Werin Bridge, Zig Zag Path and Cardiff Barrage. Tesco Supermarket. Part of Cardiff Bay Trail and National Cycle Network.
Proposed improvements	Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. Additional on-road cyclist markings should be considered to mark the route as a cycle route e.g. along Penarth Portway. Active travel signage required throughout but ensure does not conflict/ duplicate existing signage e.g. improved signage to link Barrage with Zig Zag Path and Pont-y-Werin Bridge/Cogan. Future maintenance of traffic calming features along the route could give consideration to whether the features could be improved from a cycling perspective. More long-term measures may include investigating measures to discourage rat running in the AM Peak (which may incorporate improvements to existing traffic calming measures that also impede cyclists). Additional of possible crossing points, particularly at the end of Penarth Portway (close to junction with Paget Road) and adjacent to Zig Zag Path on Terra Nova Way.
Known interdependencies	Directly links into Links B and K. Along bus route (89A/89B) Suitable access would also need to be maintained to businesses including access from boat yard across Penarth Portway to the Marina.
Land issues	No land issues identified as majority of proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified for the proposed improvements that are within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in built-up, residential streets will have traffic management implications.

Link F – Cornerswell Road and Stanwell Road Link

INM reference number	VALE-PROP-PN-C100
Existing information available	Included in INM as a 5-10 year cycling scheme. Included in the ERM as an existing pedestrian route. Not included in Sustrans' INM audit work.
Existing route characteristics, observations and constraints	West-east description of route from junction with B4267 Redlands Road in the west to Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled crossing in the east. **Cornerswell Road from junction with B4267 Redland Road to mini-roundabout junction with Stanwell Road:** Long residential street – houses on both sides with no driveways at the front of the houses leading to on-street parking on both sides of the road along the length of the street. Relatively narrow, tree-lined footways with no scope to widen due to width of carriageway and extent of on-street parking. Towards the eastern end the street becomes more commercial in nature with a number of retail premises and a school. It is assumed that traffic volumes and movements are greater at this end of the street. Parking restrictions and bollards along both footways near school. Zebra crossing adjacent to school entrance. The carriageway widens at the far eastern end due to parking controls limiting parking to one side of the street. Traffic volumes would need to be considered due to retail at eastern end of the street and potential to be used as a link from the town centre to the B4267. There are a number of junctions onto Cornerswell Road. Street lighting along the length. **Stanwell Road from mini-roundabout junction with Cornerswell Road to junction with Plymouth Road:** 5-arm mini roundabout required to be crossed from Cornerswell Road to Stanwell Road. Not expected to be high traffic volumes but could be difficult to negotiate for less confident cyclists. No crossing facilities provided for pedestrians across the roundabout (i.e. to enable a direct crossing from Cornerswell road to Stanwell Road). A crossing from the north side of Cornerswell Road to the north side of Stanwell Road requires 2 separate crossings. Dropped kerbs are in place on all arms but not necessarily on the pedestrian desire line if needing to cross more than one arm of the roundabout. No directional signage at the roundabout of destinations. Resting facilities available on closed arm of the roundabout. Evidence of footway parking along both sides of Stanwell Road between mini-roundabout and junction with Victoria Avenue.

Off-road parking available for some properties along both sides of the street.
No scope to widen footways to provide a shared use route due to carriageway width and roadside parking.
Parking close to wide junction of Victoria Avenue may prove challenging to pedestrians wishing to cross junction opposite Ty Gwyn Care Home.
No dropped kerbs or tactile paving at this location.

Parking beyond junction with Victoria Avenue only along southern side of road. Parking restrictions in place on northern side.
Road surface needs review as evidence of poor surface that could create difficulties for cyclists.
Busy junction between Stanwell Road and Victoria Road, though zebra crossing provided across Victoria Road entrance/exit.
Evidence of street furniture and outside seating on southern side of route, though done in such a way that potentially enhances user experience by providing resting opportunity and doesn't impede pedestrian flow as utilises existing street furniture placement.
Directional signage provided at footpath link down towards the station.

	Evidence of queuing traffic over railway bridge on approach to Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled junction.  Carriageway is very constrained over railway bridge on approach to traffic lights. Short offside cycle lane (15m) provided on approach to Plymouth Road/Hickman Road junction to Advanced Stop Line. Cyclist awareness sign also located before junction to warn motorists of likelihood of cyclists using the junction. Street lighting along length.
Approximate length of route	1.0km
Origins and destinations connected by link	Link provides a connection for residential areas to the west of Penarth e.g. Morristown into the town centre, to the rail station and the wider active travel network. The route connects to a primary school (Victoria Primary School) and a local retail centre.
Proposed improvements	Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings if there is sufficient width e.g. on approach to junctions. Potential to improve the Cornerswell Road/ Stanwell Road mini-roundabout for cyclists and pedestrians e.g. tighten geometry of roundabout for cyclists, also consideration of options to improve crossing of roundabout along pedestrian desire lines. Active travel signage required throughout but ensure does not conflict/ duplicate existing directional signage.

	Potential to introduce a 20mph limit within the town centre to reduce traffic speeds and improve the town centre environment for pedestrians and cyclists – link also passes Victoria Primary School and Westbourne School that would benefit from a 20mph limit. Potential to improve the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled junction for pedestrians and cyclists (although limited scope for improvements on Stanwell Road approach to junction over railway bridge due to constrained nature of highway).
Known interdependencies	Directly links into other proposed links on the wider network i.e. Links D, G and H. Consideration needed of how the proposed links (F and G) join up at the Stanwell Road/ Victoria Road junction. Consideration needed of how the proposed links (D, F and H) join up at the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled crossing. Routes within the INM require cyclists and pedestrians to cross all arms of the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled crossing – any improvements to the junction will need to accommodate active travel measures on all arms. Link along Cornerswell Road provides access into the town centre – consideration should be given to an additional Active Travel link between Cornerswell Road and Hickman Road via Grove Terrace, Grove Place and Victoria Bridge (link not currently identified in the INM). This additional link would provide access to the town centre but would avoid the Stanwell Road/ Plymouth Road/ Hickman Road signalised junction. It would also join up Links F and H and provide an improved access to Dingle Road Station. Along regular bus route.
Land issues	No land issues identified as proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified as proposed improvements would be within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in a built-up, residential street will have traffic management implications, particularly depending on the extent of the works undertaken on the Cornerswell Road/ Stanwell Road mini-roundabout, the signal-controlled junction at Stanwell Road/ Plymouth Road/ Hickman Road and towards the town centre. TROs would be required for the introduction of a 20mph limit. Evidence of footway/indiscriminate/ illegal parking that could create difficulties for pedestrians and cyclists – will need to be considered during design of proposal, also need for enforcement.

Link G – Dinas Road and Victoria Road Link

INM reference number	VALE-PROP-PN-C110
Existing information available	Included in INM as a 5-10 year cycling scheme. Majority of the route included in the ERM as an existing pedestrian route. Not included in Sustrans' INM audit work.
Existing route characteristics, observations and constraints	Southwest-northeast description of route from roundabout at end of Dinas Road, along Victoria Road to junction with Cornerswell Road, including link into Penarth rail station. **Dinas Road:** Residential street with unusual dual-carriageway/one-way system along its length and a wide, grassed central reservation along the middle of the road. Scope to widen the existing carriageway to provide a cycle lane due to the availability of land on the central reservation. The majority of properties along the street have driveways but some evidence of roadside parking in the vicinity of properties without driveways. There is the potential of higher traffic speeds due to one-way traffic and straight nature of the road. A number of junctions lead onto the street along its length. Street lighting along the length of the street. Signal controlled junction at north-eastern end of Dinas Road (at junction with Lavernock Road) and road reverts to two-way traffic. Small section of cycle lane provided on approach to signals and advance stop line at the traffic signals. **Victoria Road:** Off-side cycle lane with cycling advanced stop line on approach from Victoria Road onto Lavernock Road. Signalised pedestrian crossing facilities at junction with Lavernock Road. Entrance to school on northern side of road, with bus stop waiting areas, potential to be very busy at peak school hours. Victoria Road is a long residential street with properties along both sides of the street. Street lighting along route. Also mature trees growing in the footway on both sides of the road. Wide carriageway beyond school entrance, with evidence of parking on both sides of the street, particularly around properties without off-road parking. No dropped kerbs or tactile paving for crossing of Clinton Road junction. Wheelchair/pushchair users may also struggle with a number of kerbed-driveways along Victoria Road, particularly on the southern side. Road has been narrowed at the Dyserth Road/ Archer Road junctions onto Victoria Road to enable the junctions to be built out and a zebra crossing to be provided. Zebra crossing available close to the junction of Archer Road to cross Victoria Road, though no dropped kerbs provided at junction to cross Archer Road on both the northern and southern sides.

	Similar lack of dropped kerbs for crossing of Cwrt-Y-Vil Road, Victoria Square and Westbourne Road. Level of roadside parking increases towards the northern end of Victoria Road. Parking on the northern side of road as passes Paget Rooms and shops, with tactile paving and drop kerbs provided on the southern side of road to link into Station Approach and Penarth Station. Zebra crossing also provided at top of Victoria Road, close to junction with Stanwell Road. Cycle parking recently installed at entrance to Station Approach. High levels of parking and traffic movements along Station Approach and at the station itself are likely to create an unattractive environment for cyclists.
Length of route	1.45km
Origins and destinations connected by link	Penarth Station and surrounding town centre shops. Stanwell School (rear entrance). New housing development at end of Dinas Road.
Proposed improvements	Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. (No scope to widen footways along Victoria Road to provide a shared use route due to carriageway width and roadside parking. There is scope to provide an off-road cycle route along Dinas Road but not included in proposed improvements as unlikely to be high traffic volumes). On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings if there is sufficient width e.g. on approach to junctions. Active travel signage required throughout but ensure does not conflict/ duplicate existing directional signage. Options for improvements to the access to Penarth Railway Station from Victoria Road for pedestrians and cyclists needs consideration.
Known interdependencies	Directly links into other proposed links on the wider network i.e. Links F and J. Consideration needed of how the proposed links join up at the Victoria Road/ Cwrt-y-Vil Road junction (Links G and J) and the Stanwell Road/ Victoria Road junction (Links F and G). Along bus route and school services pick-up/drop-off on Victoria Road.
Land issues	No land issues identified as majority of proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified for the proposed improvements that are within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in built-up, residential/ town centre streets will have traffic management implications, particularly depending on the extent of the works undertaken near the rail station. On bus route.

Link H – Penarth Town Centre to Railway Walk via Hickman Road and Plymouth Road

INM reference number	VALE-PROP-PN-C070 and VALE-PROP-PN-C080
Existing information available	Included in INM as a 5-10 year cycling and pedestrian scheme. Not included in Sustrans' INM audit work. Stakeholder comment that the traffic lights at the Stanwell Road/ Plymouth Road/ Hickman Road junction are a very big issue to overcome. Stakeholder comment regarding the need for a link from the Railway Walk directly into the rail station – not currently considered due to unknowns surrounding the proposal e.g. land ownership issues, proximity to the live rail line etc.
Existing route characteristics, observations and constraints	This route connects proposed Link B (Arcot Street) with the Railway Walk, and proposed further proposed routes stemming from the Stanwell Road/ Plymouth Road junction. As a main connecting link between the proposed routes spanning both north and south, improvements along this connection are viewed to be a priority. North-south description of the route from junction with Windsor Road in the north to the Railway Walk (existing active travel route – shared-use, off-road) in the south. **Hickman Road:** Lack of crossing point at northern end of Hickman Road across Windsor Road to connect with Arcot Street. Very wide mouth of junction at northern end of Hickman Road (at junction with Windsor Raod). Evidence of footway parking on eastern side of junction with Windsor Road impeding view of both pedestrians and cyclists wishing to cross.  Parallel parking along both sides of street, with businesses on eastern side of street. Little active frontages on western side of street until after Victoria Bridge junction. Lack of highway space to deliver segregated on-road cycling provision. Footway on both sides of Hickman Road along its length. Double yellow parking restrictions close to junction with Victoria Bridge.

	Street lighting along length of route. Majority of properties south of junction with Victoria Bridge have off-road parking provision. Parallel parking on eastern side of road, limited parking on western side (prohibited Mon-Sat 8am – 6pm). Supermarket delivery area close to junction with Herbert Terrace, possible LGV/HGV traffic. Time limited parking (short stay) along Hickman Road beyond junction with Herbert Terrace, with private car park access on eastern side of road. School pedestrian entrance on western side of road, close to junction with A4160 Stanwell Road. Short length of cycle lane to Advanced Stop Line at traffic light junction with Stanwell Road. **Stanwell Road/ Hickman Road/ Plymouth Road Junction:** Signalised pedestrian crossing facilities across Hickman Road, but lacking tactile paving and/or studs (similar for all crossings at this junction, apart from crossing of Plymouth Road which has tactile paving and central refuge) Two crossing movements required to cross junction diagonally (officially), though all-red phase does allow this to be done. Nature of signalised junction and road layout could be difficult to negotiate for less confident cyclists. **Plymouth Road:** Advanced stop line on approach from Plymouth Road (south) to junction with Stanwell Road. Evidence of marking 'wear and tear'. Cycle awareness sign on approach to junction from south. Wide footways along both sides of road. Parallel parking on eastern side of road, parallel parking in central reservation (unofficially in 'keep clear' area) and mixture of bay and parallel parking on western side of Plymouth Road, both time limited (2 hours). Dropped central refuge crossing point, but parking on eastern and western sides of roads limits effectiveness.  Directional signage on eastern side of road at junction of path to Windsor Gardens with key destinations. Resting facilities available on eastern side of road outside Gallery building. Wide entrance to private parking area on western side of road, dropped kerbs in place, but evidence of blockage by parked vehicles.

Link into Railway Walk on western side of Plymouth Road, close to junction of cul-de-sac.
Signage provided via street sign, but difficult to see from Plymouth Road and no directional signage of destinations provided.
No crossing available from eastern side of Plymouth Road.

Approximate length of route	0.48km
Origins and destinations connected by link	Arcot Street cycle contraflow and proposed Active Travel link (Link A). Windsor Road and Stanwell Road shops in the town centre. Westbourne School. Railway Walk existing Active Travel link (VALE-PEN-C0100).
Proposed improvements	Measures to improve the crossing of Windsor Road at southern end of Arcot Street for pedestrians and cyclists e.g. building out the junction to reduce carriageway width at junctions if feasible (also referred to in Link B). Potential to introduce a 20mph limit within the town centre to reduce traffic speeds and improve the town centre environment for pedestrians and cyclists. Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of Hickman Road. (No scope to widen footways along Hickman Road to provide a shared use route due to carriageway width and roadside parking). Improved crossing facilities across side streets e.g. dropped kerbs. On-road cyclist markings should be considered to mark the route as a cycle route and enhanced cycle lane markings if there is sufficient width e.g. on approach to junctions. Potential to improve the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled junction for pedestrians and cyclists, including formalising diagonal crossing movements. Potential to re-model layout of parking around Plymouth Road to increase road space dedicated to active modes/public realm e.g. removal of central reservation would reduce unexpected traffic movements and potential to provide on-road cycle lanes if highway space reallocated. Measures to improve access onto/ visibility of entrance to Railway Walk. Potential crossing point provided close to this location. Active travel signage required throughout but ensure does not conflict/ duplicate existing directional signage – includes improvements to signage to increase awareness of link to Railway Walk and destinations.
Known interdependencies	Directly links into other proposed links i.e. Links B, C, D and F. Consideration needed of how the proposed links (B, C and H) join up at the Windsor Road/ Arcot Street junction. Consideration needed of how the proposed links (D, F and H) join up at the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled crossing. Routes within the INM require cyclists and pedestrians to cross all arms of the Stanwell Road/ Plymouth Road/ Hickman Road signal-controlled crossing – any improvements to the junction will need to accommodate active travel measures on all arms. Links into the wider existing Active Travel network i.e. Railway Walk. Greatest benefit will be achieved if this link is delivered in conjunction with other active travel proposals within the town centre to enable cyclists to safely negotiate the town centre environment and continue onto the wider network. Desire for a link directly from the Railway Walk into the rail station – consideration should be given to an additional Active Travel link from the Railway Walk access point at Archer Terrace, along Station Road to link to the main station entrance.

Land issues	No land issues identified as the proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified as the proposed improvements would be within the highway boundary.
Other risks/ deliverability considerations	Construction of the link in built-up, residential/ town centre streets will have traffic management implications, particularly depending on the extent of the works undertaken within the town centre. TROs would be required for the introduction of a 20mph limit. Evidence of footway/indiscriminate/ illegal parking that could create difficulties for pedestrians and cyclists – will need to be considered during design of proposal, also need for enforcement.

Link I – Link from Penarth Esplanade to Railway Walk via The Esplanade, Cliff Hill and Channel View

INM reference number	VALE-PROP-PN-C140 and VALE-PROP-PN-C150
Existing information available	Included in INM as a 5-10 year cycling scheme. Not included in INM as a pedestrian scheme. Not included in Sustrans' INM audit work. Stakeholder indication of conflicting views from the public on the use of the existing pedestrian route around headland for cycling i.e. some opposition to it – gets very busy with pedestrians at certain times.
Existing route characteristics, observations and constraints	North-south description of route from the proposed Penarth Headland Link to the connection into the existing Railway Walk. **The Esplanade:** One Way traffic (southbound) along Esplanade (cyclists would need to be able to travel in both directions). Wide eastern footway along length of Esplanade apart from section in vicinity of yacht club. Western footway also quite wide but fronts onto shops and used for outside tables by restaurants. Extensive roadside parking (western edge of carriageway) along Esplanade. Restrictive/ stop-start traffic movements assumed along road due to car parking. Limited highway width due to one-way system/ roadside parking but possibly some scope for carriageway narrowing due to one-way system. High levels of pedestrian activity along Esplanade during weekends/ holidays. Some unused footway space available on western footway due to buffer between road and footway but 'feature' lighting currently installed along its length. **Cliff Hill:** One-way system continues north-south from Esplanade. Gradient increases from Esplanade (would need to consider speed of cyclists downhill on a shared use route and uphill if on-road). Wide western footway along length. Western edge of carriageway used for roadside parking but possibly some scope for carriageway narrowing. Existing footpath along coast from top of Cliff Hill (currently marked with 'no cycling' signs). Would require widening for use as a shared use route – sufficient space available to widen. Beyond link into Channel View, pedestrian footpath continues southwards along a route also within the INM. **Channel View:** Improved access point and widening required at entrance to Channel View.

	Channel View is a quiet, dead-end residential street with development only along the southern side and green space to the northern side. Some roadside parking evident along southern side of Channel View, Footway and street lighting along the length (southern side of carriageway). Road surface needs review as evidence of potholes that could cause difficulties for cyclists. **Plymouth Road:** It is considered that this southern section of Plymouth Road (to the south of the Channel View junction) would be relatively quiet as it leads to residential streets that are not through roads. Wide residential road with little evidence of roadside parking. (All properties have driveways.) Space available on-road to implement cycle lanes if considered necessary. Footways along both side of the carriageway. Street lighting along the length. **Fforest Road and The Paddocks:** The active travel route would need to cross Fforest Road before continuing onto The Paddocks. Fforest Road is a straight, dead-end residential road with good visibility at the junction/ crossing point. The Paddocks is a 'no through road' development and quiet in terms of traffic. Evidence of some roadside parking but very limited on the section from Fforest Road to the Birch Lane junction due to little frontage development. Footways on both sides. Street lighting along the length. **Birch Lane:** Birch Lane is a quiet, dead-end residential street. A section of Birch Lane (as well as Rowan Close) already forms part of the Railway Walk route that is a shared-use route on the ERM (VALE-PEN-C0100). No specific measures are provided along these sections for cyclists and cyclists are expected to cycle on road. Footway provided where there is frontage development. Street lighting along the length. **General:** It is assumed that all the above have low traffic speeds due to the nature of the roads.
Length of route	1.6km
Origins and destinations connected by link	Connects the Esplanade and proposed Penarth Headland Link (Link K) to the existing Railway Walk active travel route/ wider network. Connects to the town centre via Beach Road (Link B). Provides a direct link to Cliff Parade playground.

Potential improvements to link	Consideration of footway widening as much as feasible to implement a shared use path for the length of the Esplanade and Cliff Hill. Alternative option along The Esplanade could be to widen carriageway through removal of buffer zone on footway and implement a contra flow cycle lane. Widening of existing footpath at top of Cliff Hill to provide a 3-metre wide, shared-use route to Channel View. Improved access point and widening at entrance to Channel View. It is considered that cyclists would need to stay on-road along Channel View, Plymouth Road, Fforest Road, The Paddocks and Birch Lane. If evidence that Plymouth Road is used as a through road then cost could include provision of on-road cycle lane markings. On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings on approach to junctions if there is sufficient width. Potential need for improvements to road surface. Active travel route signage required along length of link.
Known interdependencies	Directly links into other proposed links i.e. Links C and K. Links into the existing active travel network i.e. Railway Walk (VALE-PEN-C0100). Greatest benefit will be achieved if this link is delivered in conjunction with other active travel proposals (particularly the Penarth Headland Link).
Land issues	No land issues identified as majority of proposed improvements would be within the highway boundary. Land ownership would need to be confirmed for the section of route along the off-road footpath near Cliff Parade playground (expected to be within LA ownership).
Environmental issues	No environmental issues identified for the proposed improvements that are within the highway boundary. Potential environmental considerations along the section of route on the off-road footpath near Cliff Parade playground.
Other risks/ deliverability considerations	Likely to be objection to proposals that may impact on the character of The Esplanade e.g. any proposals to remove the 'feature' lighting. Construction of the link will have traffic management implications, particularly depending on the extent of the works undertaken along The Esplanade. Could be objection to the introduction of cycling on the existing pedestrian route around the headland (adjacent to Cliff Parade). Widening of the existing footpath link along the headland would need to consider SUDs legislation.

Link J – Cwrt-y-Vil Road and Robinswood Crescent Link

INM reference number	VALE-PROP-PN-C120
Existing information available	Included in INM as a 5-10 year cycling scheme. Not included in the INM as a pedestrian scheme. Not included in Sustrans' INM audit work.
Existing route characteristics, observations and constraints	North-south route description provided from junction with Victoria Road to link into existing Active Travel route at southern end of Robinswood Crescent. **Cwrt-y-Vil Road:** Street lighting along route. Properties forward-facing road. Lack of dropped kerb or crossing facilities close to junction with Victoria Road. Parallel parking on both sides of road, with traffic in one direction able to pass at any time. Evidence suggests plenty of opportunity for vehicles to pass in parking gaps. Some off-road parking provided for residential properties.  Lack of crossing facilities across Archer Road junction to Lower Cwrt-y-Vil Road. **Lower Cwrt-y-Vil Road:** Street lighting along route. Wide carriageway with footways on either-side. Limited parallel parking along both sides of road and evidence suggests plenty of gaps between vehicles. All residential properties along the road have driveways which limits the extent of roadside parking. Evidence of poor surface. No crossing facilities (e.g. dropped kerb, tactile paving) across Clinton Road.

	No parking restrictions at junctions.  **Robinswood Crescent:** Quiet residential street (no through road). Street lighting along route. Concrete road surface. Footways along both sides of the road, western side set back after 60m behind grass verge.  Scope to widen footway into verge on western side of road if required.

	Bay parking on western side of road for first 60m, possibly to service bowling club adjacent to route.  Off-road driveway parking to houses on eastern side of route, kerbs may prove challenging to those with wheelchairs/mobility aids/pushchairs, though western side pavement is not affected by this as no properties. Western footway provides direct link into existing shared-use Active Travel route (VALE-PEN-C0070) connecting Robinswood Crescent with Lavernock Road and residential areas to the southwest.
Length of route	0.54km
Origins and destinations connected by link	Residential areas in Lower Penarth. Connects to other proposed links into the town centre. Bowls Club and Penarth RFC. Evenlode Primary School (rear). Existing Active Travel route at southern end of Robinswood Crescent (VALE-PEN-C0070).
Potential improvements to link	Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. (No scope to widen footways along Cwrt-y-Vil Road to provide a shared use route due to carriageway width and roadside parking. There is scope to provide an off-road cycle route along Robinswood Crescent and potentially scope for footway widening along Lower Cwrt-y-Vil Road but not included in proposed improvements as likely to be low traffic volumes). On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings if there is sufficient width e.g. on approach to junctions. Consideration should be given to the junction crossing points and whether any measures could be put in place for cyclists e.g. use of parking restrictions to improve visibility. Active travel signage required along link to raise awareness of Active Travel route and destinations. Consider improvements to crossing of Cwrt-y-Vil Road close to junction with Victoria Road and crossings of Archer Road and Clinton Road e.g. dropped kerbs and tactile paving.

	Improvements needed to the access onto existing shared-use route at southern end of Robinswood Crescent for cyclists.
Known interdependencies	Directly links into proposed Link G. Links into the existing active travel network i.e. VALE-PEN-C0070. Greatest benefit will be achieved if this link is delivered in conjunction with other active travel proposals (particularly Link G and routes in the town centre).
Land issues	No land issues identified as proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified for the proposed improvements as within the highway boundary.
Other risks/ deliverability considerations	TROs would be required for the introduction of parking restrictions.

Link K – Penarth Headland Link

INM reference number	VALE-PROP-PN-C240
Existing information available	Included in INM as a 10-15 year pedestrian and cycling scheme. A number of studies have been undertaken as follows: • Vale of Glamorgan Council Penarth Headland Link – Preliminary Ecological Assessment, Arcadis, 2019 • Vale of Glamorgan Council Penarth Headland Link – Environmental Planning Review, RSK, March 2019 • Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (Version 1.0), Arup, October 2018 • Vale of Glamorgan Council – Penarth Headland Link – Stage 1 Maritime and Geotechnical Review, Arup, April 2018 • Penarth Headland Link Economic Impact Study, Sustrans, April 2018 • Penarth Headland Link Feasibility Report – Issues for the Briefing of Consultants, Penarth Headland Link Group, February 2018 • Penarth Headland Link Outline Economic Impact Assessment, Arup, November 2016
Existing route characteristics, observations and constraints	There is currently no direct route between Cardiff Barrage and Penarth Esplanade, other than via the pebble beach at low tide. The available walking and cycling routes between Cardiff Barrage and Penarth Esplanade are via the existing highway network that leads into Penarth town centre. These are indirect routes that have steep gradients.
Length of route	1.0km
Origins and destinations connected by link	Cardiff Bay Barrage Penarth Esplanade (and Penarth Pier Pavilion) Connects to proposed link along Beach Road (Link C) into the town centre Connects to the proposed link along The Esplanade (Link I) Wales Coast Path
Potential improvements to link	Proposal involves the construction of a rock-fill causeway around the headland between Penarth Esplanade and the western end of the Cardiff Bay Barrage to provide a level, shared-use pedestrian and cycling link.
Known interdependencies	Directly links into a number of proposed links i.e. Links B, C, E and I. Links into the existing active travel network via the Cardiff Bay Barrage, Penarth Marina and Paget Road.
Land issues	Sufficient land access and ownership arrangements would need to be put in place to allow the delivery and future maintenance of the PHL.
Environmental issues	The 2019 RSK report has reviewed the legislation to be considered in relation to environmental planning matters. The report identifies further studies and assessments that may be required. These include an Environmental Impact Assessment (due to the location of the proposal within the Severn Estuary), Water Framework Directive (WFD) Assessment, Habitat Regulations Assessment, Marine Licence Application and

	other consents and permits that may be required such as a Flood Risk Activity Permit, Coast Protection Act 1949 (CPA) consent and consent to work in a SSSI. An initial Preliminary Ecological Assessment (Arcadis 2019) has also been undertaken that provides details of initial surveys and ecological/ environmental requirements and the processes to be undertaken.
Other risks/ deliverability considerations	Risks and deliverability considerations linked to the PHL are considered in the main WelTAG Stage Two report (refer to Section 6.3 of WelTAG Stage Two report).

Link L – Andrew Road Link to Cogan Station

INM reference number	VALE-PROP-PN-C040 and VALE-PROP-PEN-P020
Existing information available	Included in INM as a 5-10 year cycling scheme and a 5-10 year pedestrian scheme. Additional route added following stakeholder and public consultation to ensure the proposed network provided link to Cogan Station. Feedback from stakeholder/public consultation regarding difficulties for pedestrians and cyclists at the junction of Andrew Road and the A4160 Windsor Road.
Existing route characteristics, observations and constraints	East-west route description provided from junction with A4160 Windsor Road to A4055 Merrie Harrier junction. **Andrew Road:** Pedestrians crossing the entrance of Andrew Road are required to cross a junction with large turning radii. There is evidence of dropped kerbs, but not opposite one-another and without tactile paving in place to guide pedestrians who may benefit from their presence.  Evidence shown in the image above shows vehicles parking close to the junction entrance, which may impede a driver's view of pedestrians crossing the road, as well as a pedestrian's view of oncoming traffic. Also seen in the above image is a vehicle restriction (except buses) along Andrew Road, though the road is used as the access to a number of residential properties and the Penarth Leisure Centre and proposed Well-being Hub (for which a Transport and Access Statement for the centre estimates a peak hour usage of a demand for 200 spaces). Along Andrew Road parallel parking is place on the northern side, with an access to private parking for residential properties. The road narrows below the Vale of Glamorgan Railway Line, with an access to Cogan's northbound platform on the northern side of Andrew Road west of the tunnel. Andrew Road widens and accommodates parallel vehicle parking on both the northern and southern sides of the street.

	Most houses at this location are terraced and have no provision for off-road parking. Further east along the road the housing style changes, with more provision of off-road parking (though still evidence of on street parking on both sides of the road). The route rises to the western end of Andrew Road to the junction with the Merrie Harrier (A4055 Barry Road), with a bus gate provided. Evidence suggests this is used by school route S51 between Llandough and St Richard Gwynne High School in Barry. Signage appears to suggest that cycles are not permitted to use this gate (No entry except Buses). 
Length of route	0.75km
Origins and destinations connected by link	Cogan Station; Penarth Well-being Hub/Leisure Centre; Merrie Harrier; Directly links to proposed Link M.
Potential improvements to link	Due to the nature of the built environment and the proposed link following the existing road network, it is considered that cyclists would need to stay on-road for the length of the link. On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings if there is sufficient width e.g. on approach to junctions. Active travel signage required along link to raise awareness of Active Travel route and destinations e.g. Cogan Station, Llandough Hospital. The Link would benefit from improvements to the pedestrian crossing environment at the eastern end of Andrew Road (at the junction with the A4160 Windsor Road), particularly given the expected increase in journeys being made to and from the proposed Penarth Well-being Hub. To encourage journeys to be undertaken via active modes, formalising the permissions of cycles through the Andrew Road bus gate would benefit cyclists.

Known interdependencies	Consideration needed of how the route links into proposed Link M at the Merrie Harrier junction. Consideration needed of how the route links into Cogan Station. Increasing traffic movements relating to the proposed expansion of Penarth Leisure Centre/Well-being Hub.
Land issues	No land issues expected as proposed improvements would be situated along the highway network.
Environmental issues	No environmental issues expected as proposed improvements would be situated along the highway network, though the initial desktop ecological study does highlight the likelihood of wildlife utilising an adjacent railway corridor.
Other risks/ deliverability considerations	Changes to the access at the Merrie Harrier end of the route may require additional sensors to ensure cyclists are picked up via the bus-gate traffic lights. Cyclists may also require a longer green-phase in which to navigate the junction as they will be starting on an incline.

Link M – Redlands Road Link

INM reference number	VALE-PROP-PN-C210, VALE-PROP-PN-C250 and VALE-PROP-PEN-P100
Existing information available	Included in INM as a combination of a 5-10 year and 10-15 year cycling scheme. Included in INM as partly a 5-10 year pedestrian scheme (northern section), but mostly as an existing route. Additional route added following stakeholder and public consultation to ensure the proposed network provided links to Cogan Station.
Existing route characteristics, observations and constraints	North-south route description provided from junction with Andrew Road to junction with Cornerswell Road. **Merrie Harrier junction/ A4055 section (from Andrew Road junction to B4267 Redlands Road junction):** A modal filter is provided at the top of Andrew Road, though does not state that cyclists are allowed to use this (currently no entry except buses). Pedestrian crossings are provided on some arms of the Merrie Harrier junction. Advance stop lines for cyclists are also provided before traffic lights. Footway narrows close to house at end of Andrew Road terrace (wide pavement provided on western side of A4055). Busy junction and difficult to negotiate for less experienced cyclists – options for an off-road link onto Redlands Road should be considered although options are constrained by the narrow section of footway at end of Andrew Road. Advance cycle lanes provided at junction of A4055 and B4267 Redlands Road. Eastern side of pavement follows route adjacent to cul-de-sac. **Redlands Road:** No crossing facilities at B4267/A4055 traffic lights. Footways provided on both sides of highway, non-active frontages for approximately 200m of road from A4055 junction south. Tactile paving and dropped kerbs provided at crossing of Sully Road, but wide crossing and large radii may make crossing difficult. Priority currently afforded to vehicles.  No crossing facilities provided for those wishing to cross from eastern side of Redlands Road to Sully Road, though wide carriageway may provide opportunity to facilitate crossings and/or extend provision for pedestrians and cyclists.

Footway continues on both sides along Redlands Road.
Evidence of street furniture impeding footway on western side of road and footway parking on eastern side.

Crossing refuge provided close to junction of Foxglove Rise, though very narrow and no drop-kerbs/tactile paving.

	Pedestrian barriers used around junction of Redlands Road/Access to Norris Close. Crossing provided 20m from junction, likely on desire lines for travel to school sites, though not to continue along Redlands Road. Crossing refuge provided after junction with tactile paving, priority currently afforded to on-highway traffic. Grassed highway verge along western side of Redlands Road may provide scope for footway widening and provision of a shared-use route along some sections of Redlands Road. (Highway verge is not continuous along length of route).  No dropped kerbs provided on western footway for crossing of service road to properties. Priority currently afforded to traffic.  Zebra crossing facility across B4267, close to footpath emerging on eastern side of route. Evidence of speed limit and camera reminders. Pelican crossing also provided at top of hill (150m from Zebra facility). Dropped kerbs provided at crossings of Wordsworth Avenue and Redlands Avenue, but wide corner radii and lack of tactile paving.

Wide carriageway, but evidence of footway parking adjacent to properties south of Wordsworth Avenue junction.

Dropped kerbs and tactile paving across junction with Hastings Avenue.
Priority afforded to on-highway vehicles.
Zebra crossing and narrowed carriageway for crossing of Redlands Road close to junction with Hastings Avenue and St Cyres Road.

	Highway widens south of zebra crossing, though continued evidence of footway parking. Wide turning radii of Mountjoy Avenue junction and lack of tactile paving/crossing point may cause difficulty for pedestrians wishing to continue along the eastern footway (similar on western side at Elfed Avenue junction).  Zebra crossing facility provided between junction of Elfed Avenue and Cornerswell Road. No drop kerb or tactile paving provided across Cornerswell Road. Evidence of lighting along whole route. Evidence of litter bins and resting facilities.
Length of route	1.4km
Origins and destinations connected by link	Provides a link to the proposed route along Andrew Road (Link L) and into Cogan Station. Provides a link to the proposed route along Cornerswell Road (Link F) Ysgol Gymraeg Pen-Y-Garth School St Cyres School and Ysgol Y Deri Wordsworth Park Elfed Avenue United Church
Potential improvements to link	Due to the nature of the built environment and the proposed link following the existing road network, it is likely that cyclists would need to stay on-road for the majority of the link. (It is considered that the B4267 Redlands Road would benefit from more substantial off-road improvements if there is sufficient highway width available e.g. grassed highway verge available along some sections of the route, wide carriageway along some sections.) On-road cyclist markings should be considered to mark the route as a cycle route and cycle lane markings if there is sufficient width e.g. on approach to junctions. Active travel signage required along link to raise awareness of Active Travel route and destinations e.g. Cogan Station, Llandough Hospital. Consideration needed of how the route would tie into Andrew Road at the busy Merrie Harrier junction e.g. opportunity to utilise cul-de-sac close to A4055 junction for cyclists and pedestrians to avoid need to use the highway junction. Re-sign the top of Andrew Road to 'officially' allow cyclists through modal filter (depending on preferred layout may require filter lane for cyclists to turn across A4055 traffic). Consideration to improving pedestrian crossing facilities along desire lines e.g. across side roads, increase crossing opportunities across Redlands Road such as for school journeys.

Known interdependencies	Directly links into proposed Links F and L. Consideration needed of how the route links into proposed Link L at the Merrie Harrier junction. Greatest benefits from the link will be achieved if associated facilities are provided/supported by third parties (e.g. the school sites on Sully Road) and appropriate crossing facilities are provided across Redlands Road to access the school sites.
Land issues	No land issues identified as proposed improvements would be within the highway boundary.
Environmental issues	No environmental issues identified for the proposed improvements as within the highway boundary.
Other risks/ deliverability considerations	Construction of the link will have traffic management implications. Any roadworks along the A4055 Merrie Harrier junction and the B4267 Redlands Road are likely to have knock-on effects to local traffic due to the high peak hour flows of traffic along the route. TROs would be required for the introduction of parking restrictions.

Appendix 9 Summary of Proposed Active Travel Improvements

Active Travel proposals for the Penarth Cardiff Barrage Corridor (Option 1) –

Description of proposed improvements

Link	Description of proposed works	Length of route (approx.)
Link A – Link from zig-zag path to Penarth Town Centre via Royal Close and Arcot Street	- Small-scale improvements along Paget Road and Arcot Street i.e. on-highway cycle symbol markings across each side road junction (on-highway cycle markings already in place for majority of route), route signage at junctions along the route, introduction of coloured surfacing along existing contra flow cycle lane on Arcot Street, introduction of parking restrictions/ double yellows at Paget Road/ Arcot Street junction to improve visibility. - Provision of cycle stands at southern end of link (Windsor Road). - Measures to improve the crossing of A4160 Windsor Road (from Arcot Street to/from Hickman Road) for pedestrians and cyclists i.e. narrow carriageway/ build out footway/ reduce mouth of junction at the Windsor Road/ Arcot Street junction and the Windsor Road/ Hickman Road junction to improve visibility and reduce carriageway width, introduction of parking restrictions/ double yellows on eastern side of Windsor Road/ Arcot Street junction.	0.4km
Link B – Link from Cardiff Barrage to Penarth Town Centre via Paget Road, Stanwell Crescent and Albert Road	- Small-scale improvements along Paget Road, Maughan Terrace, Stanwell Crescent and Albert Road i.e. on-highway cycle symbol markings at regular intervals along route (every 20m), additional cycle symbol markings across side road junctions, route signage at junctions along the route, introduction of parking restrictions/ double yellows at Stanwell Crescent/ Maughan Terrace junction to improve visibility.	0.71km
Link C – Link from Penarth Town Centre to Penarth Esplanade via Windsor Road, Windsor Terrace and Beach Road	- Small-scale improvements along Windsor Road, Windsor Terrace and Beach Road i.e. on-highway cycle symbol markings at regular intervals along the route (every 20m), additional cycle symbol markings across side road junctions, route signage at junctions along the route.	0.8km
Link D – Penarth Town Centre link along Stanwell Road (from Windsor Road junction to Plymouth Road junction)	- Small-scale improvements along Stanwell Road i.e. on-highway cycle symbol markings at regular intervals along the route (every 20m), additional cycle symbol markings across side road junctions, route signage at start and end of the link. - Description of works proposed at the Stanwell Road/Hickman Road/ Plymouth Road signalised junction at southern end of link included in the description and cost estimate of Link H.	0.22km
Link E – Penarth Marina Link along Penarth Portway and Terra Nova Way	- Small-scale improvements along Stanwell Road Penarth Portway and Terra Nova Way i.e. on-highway cycle symbol markings at regular intervals along Penarth Portway section of the route (every 20m), additional cycle symbol markings across side road junctions, route signage at start and end of the link and at Penarth Portway/ Terra Nova Way roundabout. NB. Future maintenance of traffic calming features along the route could give consideration to whether the features could be improved from a cycling perspective – not included in cost estimate.	1.3km

Link	Description of proposed works	Length of route (approx.)
Link F – Cornerswell Road and Stanwell Road Link	- Small-scale improvements along Cornerswell Road and Stanwell Road i.e. on-highway cycle symbol markings at regular intervals along the route (every 20m), additional cycle symbol markings across side road junctions, route signage at start and end of link and at Cornerswell Road/ Stanwell Road mini roundabout. - Improvements to Cornerswell Road/ Stanwell Road mini roundabout for pedestrians and cyclists i.e. tighten geometry/ make as compact as possible. Refer to design detail DE055 (Compact Roundabout) in Active Travel Design Guidance (pages 384 and 385). Design options would need to be considered but at this stage cost estimate based on pulling in kerb lines on approach/ exit arms and increasing size of central island. Pedestrian crossing points/ dropped kerbs to be provided on all arms. - Description of works proposed at the Stanwell Road/Hickman Road/ Plymouth Road signalised junction at end of link included in the description and cost estimate of Link H.	1.0km
Link G – Dinas Road and Victoria Road Link	- Small-scale improvements along Dinas Road and Victoria Road i.e. on-highway cycle symbol markings at regular intervals along the route (every 20m), additional cycle symbol markings across side road junctions, route signage at junctions along the route, dropped kerbs, assumes no carriageway resurfacing required. - Improvements to access into/ out of Station Approach for cyclists. Design options would need to be considered but at this stage cost estimate based in coloured surfacing/ cycle lane (1.5m wide) along length of Station Approach.	1.45km
Link H – Penarth Town Centre to Railway Walk via Hickman Road and Plymouth Road	- Small-scale improvements along Hickman Road i.e. on-highway cyclist markings at regular intervals along the route (every 20m), additional cycle symbol markings across side road junctions, route signage at junctions along the route and at entrance to Railway Walk. - Improvements to the Stanwell Road/Hickman Road/ Plymouth Road signalised junction to improve facilities for on-road cycling and pedestrians crossing on all arms. Design options would need to be considered but at this stage the cost estimate is based on making the junction as compact as possible e.g. building out footways where feasible to reduce highway space. - Advisory on-highway cycle lanes (1.5m wide) with coloured surfacing on both sides of Plymouth Road from Stanwell Road/ Plymouth Road/ Hickman Road signalised junction to off-road entrance to Railway Walk - refer to design detail DE015 (Cycle lane passing car parking) in Active Travel Design Guidance (pages 304 and 305). Signage of advisory cycle route at Railway Walk entrance to alert drivers to the start/ end of cycle lane. - Improvements to entrance to Railway Walk for pedestrians and cyclists – build out footway as much as feasible and include dropped kerbs.	0.48m

Link	Description of proposed works	Length of route (approx.)
Link I – Link from Penarth Esplanade to Railway Walk via The Esplanade, Cliff Hill and Channel View	- Small-scale improvements along Channel View, Plymouth Road, Fforest Road, The Paddocks and Birch Lane i.e. on-highway cycle symbol markings at regular intervals (every 20m), additional cycle symbol markings across side road junctions, route signage at junctions along the route and at start and end of off-road section. - Provision of a two-way cycle link along The Esplanade and Cliff Hill through the introduction of a contraflow cycle lane (1.5m wide with 0.5m buffer strip) – refer to design detail DE010 (Unsegregated contraflow cycling) in Active Travel Design guidance (pages 294 and 295). Design options would need to be considered to establish whether there is sufficient highway space without the removal of parking, but at this stage the cost estimate is based on: - Removal of the existing 'buffer zone' adjacent to the footway along the length of The Esplanade to provide additional highway width and reposition the lighting columns that are positioned in the buffer zone onto the footway; - Removal of existing road narrowing at the zebra crossing and replacing with raised zebra; - Reconfiguring the parking layout along the length of The Esplanade so that drivers are required to reverse into spaces; - Contraflow cycle route signs at the start and end of the contraflow cycle lane. - Widening of existing off-road footpath between Cliff Hill and Channel View to provide a 3-metre wide, surfaced, shared-use route. - Improve/ widen access point to Channel View from off-road route.	1.6km
Link J – Cwrt-y-Vil Road and Robinswood Crescent Link	- Small-scale improvements along Cwrt-y-Vil Road, Lower Cwrt-y-Vil Road and Robinswood Crescent i.e. on-highway cycle symbol markings at regular intervals along the route (every 20m), introduction of parking restrictions/ double yellows at the Victoria Road/ Cwrt-y-Vil Road junction to improve visibility, route signage at junctions along the route. - Improve/ widen off-road link onto existing off-road route at southern end of Robinswood Crescent (approx. 20m in length).	0.54km
Link K – Penarth Headland Link	- Construction of a rock-fill causeway between Penarth Esplanade and the western end of the Cardiff Bay Barrage to provide a shared-use pedestrian and cycling link.	1.0km
Link L – Andrew Road link to Cogan Station	- Small-scale improvements along Andrew Road i.e. on-highway cycle symbol markings at regular intervals along the route (every 20m), additional cycle symbol markings across side road junctions, route signage at start and end of link.	0.75km
Link M – Redlands Road link	- Small-scale improvements along Redlands Road i.e. advisory on-highway cycle lanes (1.5m wide) on both sides of Redlands Road from Cornerswell Road junction to St. Cyres Road junction, advisory cycle route signage at start/ end of cycle lane, on-highway cycle symbol markings along route from St. Cyres Road junction to A4055 junction (every 20m), additional cycle symbol markings across side road junctions along the route. - Design options would need to consider how route links to Andrew Road – not currently included in cost estimate.	1.4km

Notes:

- Cost estimate for Option 1 also includes the introduction of a 20mph limit within the town centre – cost estimate assumes a signage only/ no vertical features scheme with gateway features. Cost estimate of whole of proposed 20mph limit within town centre included. Extent of 20mph limit to be determined and therefore a high-level cost estimate included.
- Cost estimate for Option 1 includes a package cost for the provision of dropped kerb crossing points and additional signage that may be required across the network.
- Cost estimates do not include costs for any highway resurfacing/ maintenance. It is assumed that this would need to be funded from maintenance budgets. It is recommended that a review of any resurfacing requirements and associated works are undertaken in conjunction with any active travel improvement works.

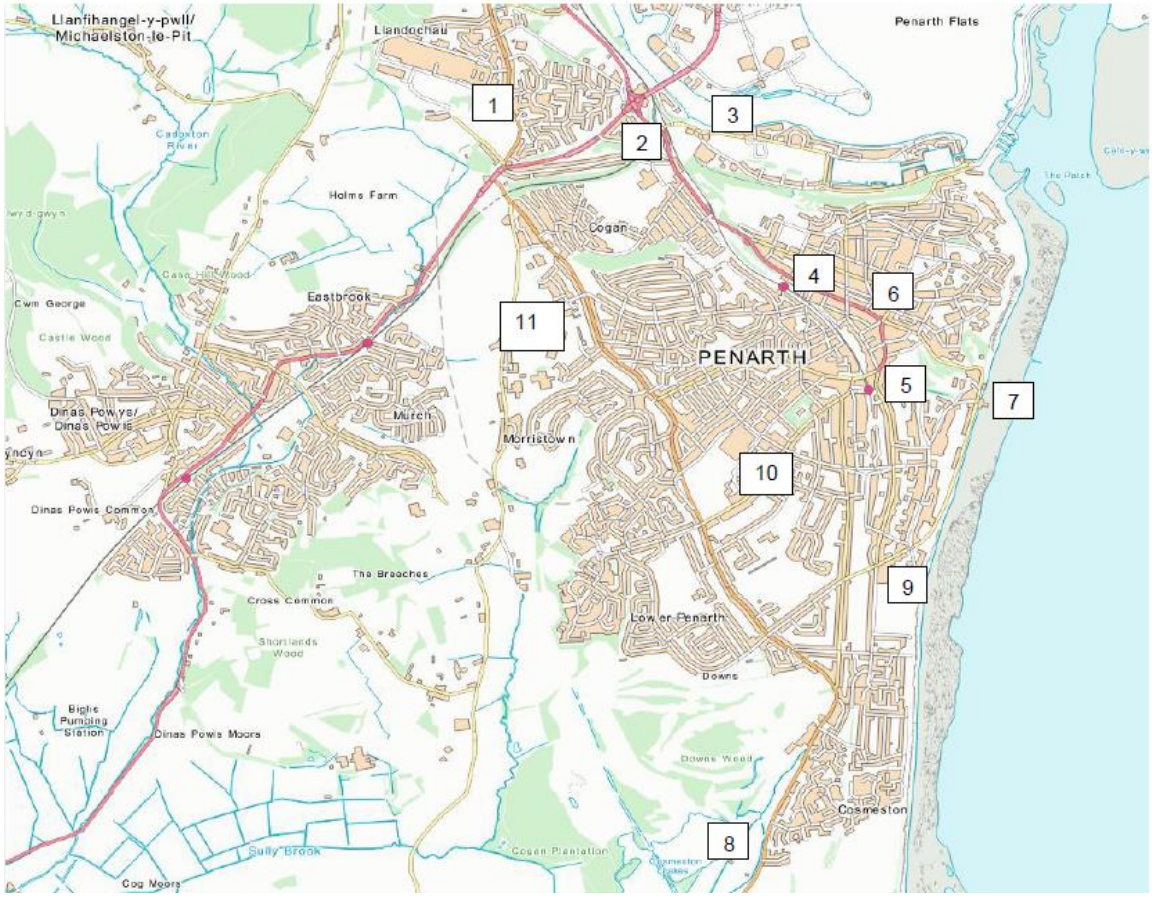
Appendix 10 Plan of Potential Bike Hire Locations in Penarth

3 Scope

The Council wishes to understand the available options for a cycle hire scheme. We therefore intend to initially operate a pilot scheme for a cycle hire facility in the Penarth area. This will include:

- a number of cycle docking stations;
- a mobile phone app to arrange the hire of the cycles;
- the ability to monitor and report on usage;
- operator provided maintenance of the cycles;
- connectivity with other cycle hire schemes in the locality;
- the option of both bicycles and e-bikes.

The map below shows indicative sites for docking stations in the Penarth area:



1. Llandough Hospital *
2. Cogan Leisure Centre/Cogan Train Station*
3. Pont-Y-Werin Bridge****
4. Dingle Road Train Station*
5. Penarth Train Station*
6. Windsor Road (Town Centre)*
7. Penarth Esplanade/Pier**
8. Cosmeston Country Park and Lake**
9. Penarth Cliff Tops**
10. Stanwell Comprehensives School***
11. St Cyres Comprehensive School***

These sites have been identified as having heavy footfall*, a tourist attraction**, key establishment in the area*** or a link between Cardiff and Penarth****.

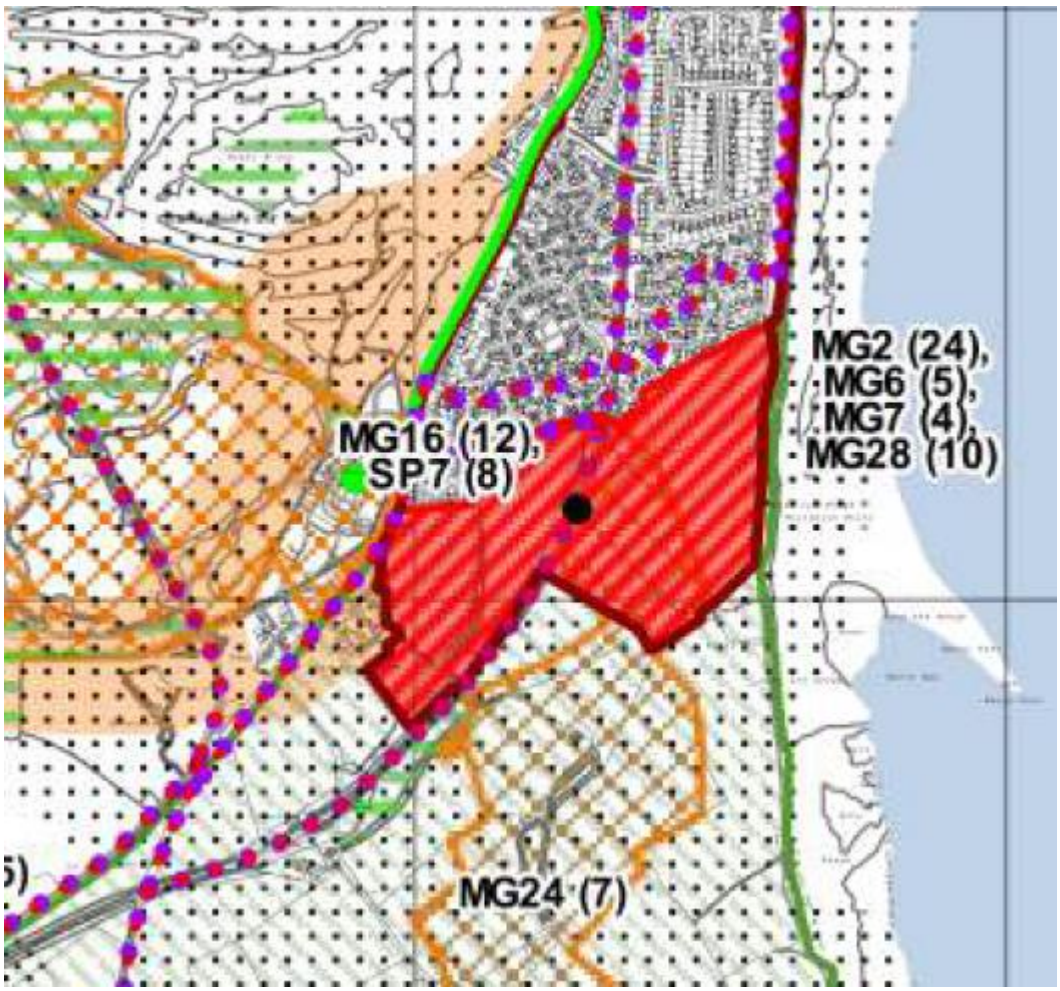
Appendix 11 Review of Cosmeston Park and Ride Sites

Location of Cosmeston Park and Ride Notes

Background

The LDP incldues as policy SP7 (8) 'Bus park and ride at Cosmeston, Penarth'. This is shown on the proposal map (snipt in Figure 1.1) – however, it is appears to just be an indicative 'dot' rather than an actual allocation of a specfic section of land at the lakes.

Figure 1.1- VOG LDP Proposals Plan showing SP7 (*) – Bus Park and Ride at Cosmeston, Penarth



The 2018 Arup report states (p18) '*Land at Cosmeston has been identified within The Vale of Glamorgan's Local Development Plan as being suitable to accommodate a large surface car park'*. It includes the plan shown in Figure 1.2. The exact area of land to be used is again unclear from the plan provided within this report.

Page 79 of the report within Appendix B states that: '*This sub-option involves a P&R facility at Cosmeston Lakes Country Park. The site currently comprises a car park with gravel surfacing. The site has good access to the adjacent B4267, with access into / out of the car park via a priority junction.*

The location of the site means that the bulk of the population within its catchment would need to travel southwards to the P&R site, prior to travelling northwards to Cardiff by bus'

Figure 1.2 – Arup 2018 Report Location of Cosmeston P&R site

It is assumed that Arup are referring to the car park shown in Picture 1.1 as the gravel area (shown as area 1 in Figure 1.4).

Current Parking Provision

A recent parking study undertaken on Cosmeston Lakes by Capita for VOG Council[1] states that '*Cosmeston Lakes Country Park has approximately 750 parking spaces, with 265 of these on hard standings and the rest provided in overflow car parking areas (used in the summertime only).*' Figure 1.3 shows the breakdown of parking areas and Capacity.

[1] Cosmeston and Porthkerry Country Parks: Car Park Study, Final Report | February 2016, Capita

Figure 1.3: Parking Areas at Cosmeston Lakes

Picture 1.1 – Gravel Car Park area at Cosmeston

Possible Locations for Park and Ride Car Park

Figure 1.4 – Possible Sites for Park and Ride Car Park

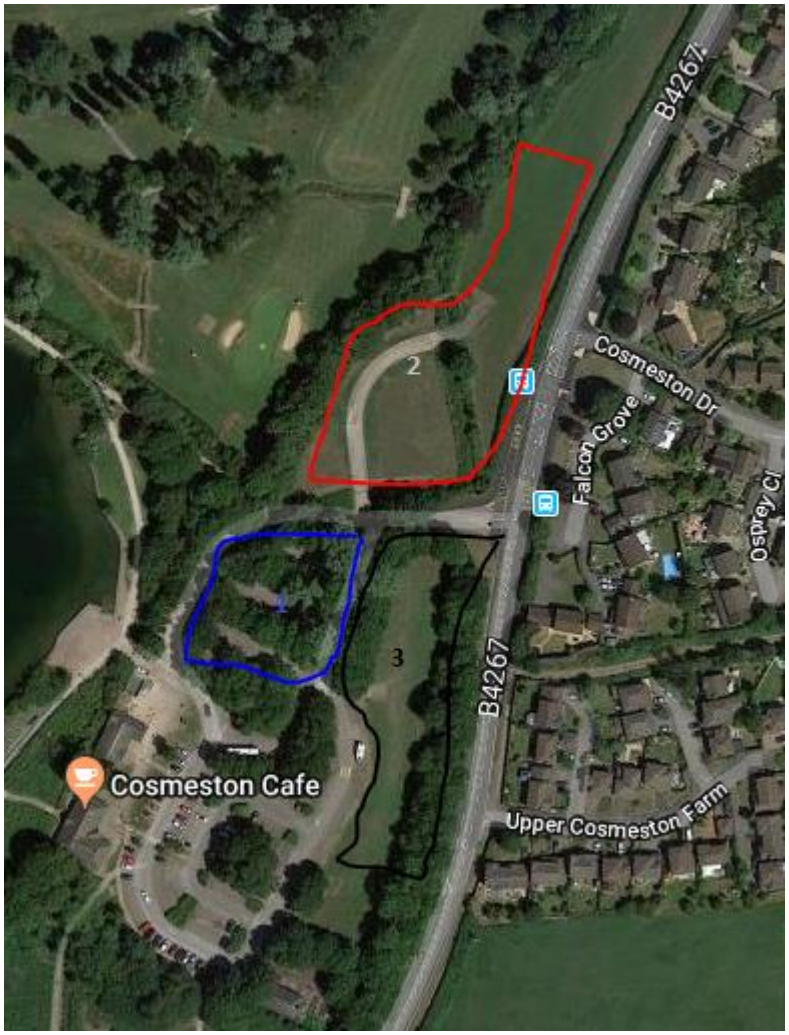


Figure 1.4 shows a very rough indication of the possible areas that a Park and Ride car park could be located at Cosmeston Lakes. All have disadvantages – as detailed in Table 1.1. Picture 1.2 and 1.3 show site 2 and 3. Site 2 and 3 are field locations used as overflow car parks during peak periods of visitors to the lake e.g summer time, bank holidays or for events.

Picture 1.2 – Site 2 Entrance to Overflow Car Parking Area

Picture 1.3 – Site 3 – Overflow Parking Area

Advantages and Disadvantages of Possible Park and Ride Parking Locations

Table 1.1: Disadvantage & Advantages of Park and Ride car park locations (assumed all locations are within VOG ownerships as operators of the Country Park):

Area	Advantages	Disadvantages
1	Existing parking area already in place – just likely need formalisation of parking bays / signing and internal access works for drop of and pick up points for buses	Currently is used by people accessing the lakes - need formalisation to ensure separation (will it take parking that is needed for everyday use of the lakes?)
		Possible conflict with users of the lake and traffic of buses / cars to Park and Ride and users of adjacent car park enjoying the country park.
		Internal layout for bus access would require checking to ensure turning circles etc to ensure feasible. As would check on whether there is space for 150 cars, with area defined.
		If a re-figured internal layout is required, this may impact upon a number of existing trees that help to define car parking bays.
2	Existing access to the site created (see picture 1.2).	Site is in a current green field so likely environmental implications of putting in urban feature such as a Park and Ride site (car park surface, lighting, signage).
	More separate area to other parking areas at the lake, so would provide better distinction between park and ride and area for use for parking for the lake and medieval village.	Access into and out of the site (turning circles) would need to be checked.

		Internal layout required to be checked such as whether area large enough for 150 spaces plus area for drop off and pick up etc .
		Although overflow area, will take away area for additional parking needed during peak times at lake (if P&R only weekdays then could be used by lake users during weekends / B/H's etc)
3		Existing internal access (see photo 1. 3) would likely require moving or widening to ensure tuning circle and sufficient flow of cars into and out of site.
		Likely conflict of vehicles accessing the lake and accessing Park and Ride as very near to lake parking area and same internal access route likely to be used.
		If new internal access into the area created likely to result in a loss of large amount of trees which could be protected or have environmental implications.
		Likely to spoil the landscape of the country park being located so close to the lake and area used by leisure visitors.
		Although overflow will take away area needed during peak times at lake and for holding events (if P&R only weekdays then could be used by lake users during weekends / B/H's etc)
		Would require check on internal layout to determine whether there is space for 150 vehicles within the defined area.

Site Access

In terms of access into and out of the site from Lavernock Road, the junction seems to be of a good standard. Using the proposed favoured route for buses to travel towards the barrage detailed in the 2018 Arup report, buses would turn right in and exit left. There appears to be sufficient space in the splitter island for the bus to wait to turn.

In terms of car access into the site from the junction it would need to be confirmed if the splitter island would be sufficient length to accommodate the potential demand for extra right turning vehicles into the site during peak periods (if Lavernock Road is busy and cars have to wait to turn right).

Picture 1.4– Access junction into Cosmeston Lakes

Internally within the site changes may be required to the road layout to accommodate the buses coming into site to access the Park and Ride pick up locations. There is likely to be lining, signing and possible widening of some access routes. This could have environmental impacts.

Site 1 is likely to require signing, lining, potential changes in parking layout to accommodate bus access and provision of bus shelters and lighting etc.

Site 2 and 3 would require a new car park surface and lighting with possible bus shelters etc with associated works to ensure secure Park and Ride parking standards. The alignment of Site 2 is likely to have the least impact on the existing trees of the site.

For the reasons outlined within this Appendix, Site 2 has been determined as the preferred location as it limits the extent of tree removal that would be required to develop the site and has sufficient space to accommodate the 150 parking spaces required and associated park and ride infrastructure, e.g. bus turning area, passenger waiting facilities.

Appendix 12 Review of Bus Priority Routes

ARUP Report Option Reference	Proposed Route	Pro	Con	Other
Sub-option A (Arup Report preferred option) – scored +7 in Arup assessment	Westbourne Road, A4160 Stanwell Road, Clive Place and Paget Terrace/Road to Cardiff Barrage	- Most direct route (of options) between Cosmeston and Barrage. - Travels via key trip generators including: • Penarth Station • Penarth Town Centre • Headlands School - Interchange opportunities available with train and bus services from Windsor Road. - Much of proposal along current bus route (Paget Rd, Paget Place, St Augustine's Crescent, Clive Place, Stanwell Rd, Victoria Road, Westbourne Road and Lavernock Road all along current routes, with associated infrastructure). - Westbourne Road priority already in place over side road junctions i.e. no junctions need to be crossed along the Westbourne Road section of the route. - Route includes relatively wide lengths of road that may have sufficient space for some bus priority measures e.g. some of Westbourne Road and Clive Place. However it is considered that the main delays for buses will be experienced at junctions along the route and in the town centre rather than along the straighter sections of the route. (Also applies to Sub-option B below).	- Would require right turn across busy B4267 (South-North) onto Westbourne Road. - Westbourne Road (north of Raisdale Road junction), evidence of increasing levels of on-street parking (some formal). - Traffic calming (raised table) across junction with Clinton Road – not expected to cause a problem for buses. - Westbourne Road (north of Clinton Road junction), parallel parking on both sides of road, less houses have off-road parking provision. Evidence shows plenty of passing opportunity, but requires 'give and take', potentially impeding flow of buses. - Victoria Road priority over Westbourne Road (right turn south-north). The following points also apply to sub-option B route below: - Stanwell Road priority over Victoria Road (right turn south-north). - Narrow approach towards Plymouth Rd/Hickman Rd junction, with evidence of queuing traffic for lights. Narrow carriageway over railway bridge – no highway space for bus priority improvements. - Evidence of delivery vehicles on Stanwell Road. Vehicles parked on both sides of Stanwell Road may also impede flow (give and take required). Note: Other routes travel via Rectory Rd and Windsor Terrace to serve bus stop on W/T. - New bus stop and associated infrastructure may be required along Albert Road as not a current bus route (current stop on Windsor Terrace/Windsor Road). Note: Other routes travel via Rectory Rd and Windsor Terrace to serve bus stop on W/T. - Limited residential off-road parking/ extensive on-road parking along Clive Place, though wide road with evidence of low traffic flow. - Steep incline travelling north-south along St Augustine's Crescent. - Sharp right turn required onto Paget Road from Paget Terrace and steep gradient along Paget Road (with road humps). - Route requires buses to travel through the town centre and be subject to traffic congestion/delays and traffic movements characteristic of a town centre environment. - Limited scope for bus priority measures within the town centre due to constrained nature of the built environment. - Signal-controlled junction along the route has little scope for bus priority improvements due to the limited highway space available. - If the bus service includes additional stops within Penarth town centre, this will increase the journey time for those using the Park and Ride.	Length of route - 4.06km (approx) Cosmeston junction – Barrage (Penarth end) Peak hour journey time by car = 12 minutes (Google Maps, 2019) Success subject to Barrage being available for buses to run across

ARUP Report Option Reference	Proposed Route	Pro	Con	Other
Sub-option B – scored +5 in Arup assessment	B4267 Lavernock Road, Victoria Road, A4160 Stanwell Road, Albert Road and Clive Place to Cardiff Barrage	- Travels via key trip generators including: • Penarth Station • Penarth Town Centre • Stanwell School (Rear) • Headlands School - No evidence of parking or blocking of carriageway on B4267 south of junction with Victoria Road. - Lavernock Road priority already in place over side road junctions i.e. no junctions need to be crossed along the Lavernock Road section of the route. - Lavernock Road (to junction with Victoria Road) along current bus route, associated infrastructure already in place (e.g. bus stop and shelter). Also northern end of Victoria Road, Stanwell Road, Clive Place, St Augustine's Crescent, Paget Place and Paget Road along current bus routes. - Traffic lights at junction with Victoria Road with right filter arrow. Relatively wide junction and some highway space and land available that would enable bus priority measures at the junction to be considered. - Wide carriageway along Victoria Road. On street parking on both sides of road, but space to allow 2 vehicles to pass at once. - Interchange opportunities available in Penarth Town Centre (both bus and rail). - May additionally benefit school services travelling to/from Stanwell School and Westbourne Prep School.	- Right turn required at Victoria Road/Lavernock Road signal-controlled junction for buses travelling south-north – currently one lane approach to signals along Lavernock Road and Victoria Road. Buses likely to experience delays at traffic signals during peak periods. - Route via Victoria Road likely to become busy at peak school hours, as main bus drop-off/pick-up of secondary school is along the northern side of Victoria Road (x4 school bus routes drop off and pick up from here, arriving approx. 08:20 and departing approx. 15:05). Number of parking bays for school buses along Victoria Road - Road narrows close to junction with Archer Road for Zebra Crossing. May be some give and take required (depending on width of buses and oncoming vehicles). - School entrance of Westbourne Prep School on Victoria Road may be busy and cause congestion of on-street parking, particularly at peak hours. - Non-priority right turn required onto Stanwell Road (south-north). - Route follows same route as Sub-option B from Westbourne Road/ Victoria Road junction – refer to detail in above section.	4.71km (approx) Cosmeston Junction – Barrage (Penarth end) Peak hour journey time by car = 12 minutes (Google Maps, 2019) Success subject to Barrage being available for buses to run across

ARUP Report Option Reference	Proposed Route	Pro	Con	Other
Sub-option D – scored +6 in Arup assessment	Bus priority measures along B4267 Lavernock Road to the Merrie Harrier junction with the A4055, the Barons Court Junction down to the Barrage via Terra Nova Way	- Travels via Key Trip Generators, including: • Cogan Station • Tesco Supermarket - Also passes close to Llandough Hospital - No evidence of parking or blocking of carriageways on B4267 south of junction with Victoria Rd. - Lavernock Road priority already in place over side road junctions. - Lavernock Road (to junction with Victoria Rd) along current bus route, associated infrastructure already in place (e.g. bus stop and shelter). - Traffic signals at junction with Victoria Road with right filter arrow. Right turning filters at Lavernock Road junction likely to benefit buses travelling across junction, as no need to wait for right-turning traffic to get past. Relatively wide junction and some highway space/ land available that would enable bus priority measures to be considered. - Signal-controlled Lavernock Road/ Stanwell Road junction – some highway spaces and verge available at the junction and on the approach to the junction that would enable bus priority measures to be considered. - B4267 Redlands Road (generally) wide north of junction with Chestnut Way, with priority over side roads. - Two-lane approach to traffic signals for south-north traffic at Merrie Harrier junction – potential to reallocate highway space/ introduce bus priority measures. - 3 traffic lanes on A4055 Barry Road, potential opportunity for bus priority measures at this location (Widens to 4 lanes at eastern end) – see Capita 2016 report. Bus priority scheme has previously been considered between Merrie Harrier and Barons Court junctions. - Route avoids Penarth town centre.	- Route crosses signal-controlled junctions at Lavernock Road/ Victoria Road junction, Lavernock Road/ Stanwell Road junction, Merrie Harrier junction and Barons Court junction) which will impact upon bus journey times. Bus priority measures would need to be considered at each of the junctions as likely to be key congestion points along the route. - B4267 narrows north of junction with Stanwell Road/Redlands Road until junction with Chestnut Way. - Evidence of on-street parking on eastern side of Redlands Road may cause obstruction. - Evidence of traffic congestion on approach to Merrie Harrier junction, particularly for right turning vehicles. 2 sets of traffic signals to pass through. - Lack of opportunity to pick-up additional passengers along A4055 Barry Road due to lack of trip origins/destinations. - Evidence of queuing on approach to Barons Court junction from both A4055 and A4160. - Narrow carriageway/ mini roundabout over the A4160 Cogan Bridge. - Road humps/ raised tables across junctions along Terra Nova Way and Penarth Portway. - Route crosses congested junctions (Merrie Harrier, Barons Court) and requires buses to negotiate the busy A4160 Cogan Hill mini roundabout.	6.32km (approx.) from Cosmeston Junction to Barrage (Penarth end) Peak hour journey time by car – 12-20 minutes (Google Maps, 2019) Success subject to Barrage being available for buses to run across

Appendix 13 Introduction of Buses on Cardiff Barrage – Existing Studies

List of studies completed to date in relation to the proposal to introduce buses onto Cardiff Barrage. (List of studies provided by Cardiff Council.)

- Cardiff Bay Barrage Transport Link Feasibility Report, Arup, October 2015
- Cardiff Bay Barrage Load Assessment Report – Bascule Bridges, Sluice Bridges and Fish Pass Bridge, WSP, June 2017
- Cardiff Barrage Geotechnical Assessment, WSP, June 2018
- Cardiff Bay Barrage Pavement Technical Note, WSP, June 2018
- Extract from Cardiff Bay Barrage Transport Link Feasibility Report, Arup, October 2015 (see details overleaf)

Cardiff Council
Arup Feasibility Report | Oct 2015

Cardiff Bay Barrage Transport Link

ARUP

8.3 Route Option Indicative Costs

Preliminary assessments have been made of infrastructure costs for the bus route options A and B, and are shown in Table 8.1. All the cost estimates in this Study are preliminary in order to identify a scale of cost and will be subsequent to further review at the detailed design stage. As can be seen, depending on the road alignment option between Discovery Quay and Queen Alexandra House, the overall cost is estimated at between £1.9M and £3.2M.

A contingency of 20% has been included within the cost estimation. A further specific contingency cost has also been identified for overlaying the embankment road, and for provision of bus priority measures elsewhere on the bus route (to ensure that the bus arrival time at the barrage is reliable in respect of co-ordination with the lock and bridge opening schedule). It is estimated that these two items, if required, could add a further £1.2M.

It should be noted that a significant proportion of the scheme costs have benefits beyond the 'bus project'; for example:

- improved management of vehicle and pedestrian interaction on the barrage,
- the new busway from Alexandra Head to Heol Porth Teigr could also serve as a development access road.

Table 8.1: Indicative Assessment of Infrastructure Costs of Route Options

Element	Description	Option A:Bus Route on Cargo Road (ABP Land)	Option B:New Bus Route on Welsh Government Land
Lock/Bascule Bridge Section	Bascule Bridge / Sluice shared space (Signage/Paving/Pedestrian Crossing)	£100,000	£100,000
	New Automated Bollard Systems	£120,000	£120,000
	Upgraded Bascule Bridge Barrier Control	£200,000	£200,000
	Sub-total Costs	**£420,000**	**£420,000**
Embankment Section	Pedestrian crossing / minor improvements	£10,000	£10,000
	Cycle Lane Segregation	£25,000	£25,000
	Low level Pedestrian Lighting / Cabling	£150,000	£150,000
	Sub-total Costs	**£185,000**	**£185,000**
Alexandra Head - Heol Porth Teigr Section	Site Clearance	£19,500	£199,250
	Traffic Management	£34,000	£49,000
	New road and footway	£322,000	£684,500
	Lighting/Electrical	£38,500	£110,000
	New Bus Gates	£50,000	£0
	Highway Drainage	£79,000	£209,500
	Earthworks	£49,900	£127,000
	Contractors Preliminary Items	£118,500	£275,800
	Utilities Provision	£12,500	£25,000
	Sub-total Costs	**£723,900**	**£1,680,000**
Infrastructure Sum Total		**£1,328,900**	**£2,285,050**
Other Project Costs and Contingency	Consultants Design Fee (10%)	£132,890.0	£228,505.0
	Local Authority Fees (5%)	£66,445.00	£114,252.50
	Statutory Body Approval Fees (5%)	£66,445.00	£114,252.50
	Overall Project Contingency (20%)	£265,780.00	£457,010.00
Project Total (excl. VAT)		**£1,900,000**	**£3,200,000**

Specific Additional Contingencies	Overlay of Embankment Road	£700,000	£700,000
	Additional bus priority elsewhere	£500,000	£500,000
	Sub-total Costs (excl. VAT)	**£1,200,000**	**£1,200,000**

The following caveats should be noted in respect of the cost estimation (which are preliminary in order to identify a scale of cost):

1) Costs are current at second quarter 2015 and does not allow for: demolition; land costs; inflation; non highways clearance or VAT.
2) The cost estimate allows for: removal of existing highway, new highway over 'greenfield' section. Allowances have been made for lighting / drainage / ITS equipment however this is subject to detail design by appropriate engineers.
3) Costs include preliminary assessment of Consultants and Local Authority Fees or statutory bodies associated with Detailed Design, Approvals and an overall project contingency allowance.
4) No Allowance has been made for the removal costs associated with contaminated material believed to be in the existing mound within Igloo developable land. (Bus Route Option B).

9 Summary and Next Steps

9.1 Addressing the Brief

As part of this feasibility study a number of consultation meetings and workshops have been held with key stakeholder from local authorities to bus operators. Investigations have identified that there is technical feasibility for providing a new bus route over the barrage. A review of the risks, together with planning, environmental or health and safety requirements have not highlighted any major obstacles for the implementation of the scheme. A summary of the findings and recommendations for each of the specific project objectives is presented in Table 9.1.

Table 9.1: Project Objectives and Findings / Recommendations

Project Objectives	Summary of Findings / Recommendations
Investigate whether the existing barrage infrastructure facilities can safely accommodate a new bus link, taking account of road construction, current road widths, street lighting, cyclists & pedestrian links and the open space recreational parks	The barrage infrastructure has been investigated in respect of the Bascule Bridge and sluice structure, the road construction on the barrage embankment. In summary, the bridge structure requires detailed study to assess its suitability for bus movements (since the design details are not available), the road section requires some investigation of its construction cross-section to confirm its suitability. Investigation of other issues (cyclist, pedestrians, lighting) indicate that a shared space environment on the Bascule Bridge section would provide an appropriate and safe means to carry bus traffic and pedestrian / cycle movements.
Identify if there are any planning, environmental or health and safety requirements to implement the options	Environmental issues have been investigated and no major risk items have been identified. Although road drainage on the barrage currently empties to the adjacent sea/bay the impact of additional bus traffic is not considered to be a significant risk in respect of accidental oil/petrol spillage. CDM and Road Safety Audit processes should proceed if the project is progressed from the outline design set out in this Report.
Determine possible implications for the structure after 5 years of bus service over the bascule bridge	A technical review of the bascule bridges found no significant visual defects to the paintwork or areas of corrosion. However, no information has been provided that either states the design carrying capacity of the bridges or fatigue loading conditions and therefore further structural investigations (involving installation of strain gauges) are recommended to enable the ability of

Project Objectives	Summary of Findings / Recommendations
	the bridges to carry bus traffic to be firmly established. This would include detailed inspections of all bridges to record their condition and identify the deck details.
Investigate management/controls systems which will need to be in place to allow buses, cycles, pedestrians and boats to navigate safely over and through the lock gates and/or Harbour Authority land during operational hours	The proposed arrangement for bus movements at the lock section is to operate the buses on a 30 minute schedule such that their arrival matches the opening/closing schedule of the bascule bridges. The lock/bridge schedule (which has an Out vessel movement at 00 and 30 minutes past the hour, and an In movement at 15 and 45 minutes past the hour) provides a theoretical 'window' of 10—15 minutes every 30 minutes for passage of vehicles.
Determine whether existing bascule bridge can accommodate buses driving over the structure (48 buses per day), taking account of pedestrian and cycle movement	Operating a bus service will require improved management of bus, car, pedestrian and cycle movements across barrage roadway – and in the vicinity of the lock / sluice roadway in particular. It is proposed to: • Establish the roadway as a Shared Space area (for pedestrians, cyclists and vehicles) with appropriate signage and road markings • Install rising bollards at both ends of the lock/sluice section, to control vehicle movement into the bascule bridge area; this will allow greater control of vehicle access and interaction with bridge raising/lowering operations. Usage of the bascule bridge area by pedestrians and cyclists would be similar to the present situation – but with improved signage and management of the roadspace. In particular, the bunching of pedestrians and waiting vehicles at the bascule bridge barriers will be avoided – as the control centre will be able to block vehicle access to the bridges for a period before the barriers are raised. It will be important that buses are driven slowly through this area.
Investigate operational arrangements that will need to be put in place for bus services, when barrage/bascule bridge is	It is recommended that an alternative bus service route is operated (and included on the published bus service timetable) at periods of busy pedestrian activity, likely to be during the 10am – 4pm period on Sundays.

Project Objectives	Summary of Findings / Recommendations
closed for maintenance work, poor weather and events etc.	For events, when the locks are closed for periods or vehicle access is restricted, the alternative bus service would operate for an appropriate period. The service would be routed such that it would be routed close to both ends of the barrage in both directions (and could thus would provide a service to the barrage during events). Instigating the alternative service will require appropriate publicity to ensure passengers are aware of the arrangement.
Provide outline design options with indicative costs for how buses can safely travel on to and stop at the barrage from Paget Road/Penarth Marina end including any infrastructure works necessary to improve the route(s) to the Barrage at the Penarth end	Infrastructure design options have been devised for the Barrage roadway and bridge sections, as set out above. For the prospective bus route to Penarth, the current '89' service (operated by Watts Coaches) travels via Paget Road and through Penarth Marina. This indicates that the relatively steep incline of Paget Road is able to be negotiated by buses. It can thus be concluded that it is feasible for buses to travel from Penarth to the western end of the barrage – with no new infrastructure needed.
Provide road alignment options and indicative costs for connecting the bus link from Queen Alexandra House to Discovery Quay	An infrastructure assessment was made for the highway section from the Barrage through to the existing highway network at Heol Porth Teigr. There have been two separate options investigated which are as follows: • Route Option A via Cargo Road, with a short new section of road linking the Heol Porth Teigr / Harbour Road roundabout with Cargo Road (with an approximate £1.9M cost), and • Route Option B, via a new busway (of approximate £3.2M cost) through land currently owned by Welsh Government but subject to future development plans. On review of both scheme options, including indicative costs, Option B would have the greater project capital cost but Option A's deliverability is subject to agreement with ABP and the land acquisition requirement and financial arrangements are unknown. Whilst the Option A route through ABP land would appear to provide the least cost option,

Project Objectives	Summary of Findings / Recommendations
	there are several high-level Cardiff Bay masterplanning decisions and agreements to be undertaken which would affect the programme deliverability. In respect of deliverability, Option B is the preferred option. However, as part of the early phasing of a new bus route, it could be agreed with ABP to use part of Cargo Road as temporary route while awaiting construction of the new bus route carriageway. Option B's precise alignment would be subject to detailed design considerations, and the location would ideally be situated close to the ABP land boundary to ensure as much developable land is available close to the Cardiff Bay water edge.
Quantify operational and management risks for introducing a bus link over the barrage	The preliminary risk assessment above indicates that the most significant risks can be addressed as follows: • Minimising operational risk will require that bus traffic management is included within the barrage operational duties. Installation of an upgraded vehicle access control system (with automatic bollards on both ends of the Bascule Bridge / Sluice roadway) will ensure that the barrage operation can manage boat and vehicle movements efficiently. • Risks associated with pedestrians and cyclists using the barrage can be minimised by instituting a 'shared space' roadway, and by installing automated vehicle access control bollards at both ends of the Bascule Bridge / Sluice roadway to enable vehicles to be held back from the Bascule Bridge area prior to raising the bridges • The risks to the reliability of the bus service being affected by busy pedestrian activity or events in Cardiff Bay can be addressed by re-routing the bus service (on a planned basis) to an alternative route which avoids the Barrage e.g. on Sundays between 10am and 4pm.
Identify any costs for upgrading or improving the bascule	In respect of the ability for the Bascule Bridge structure to carry additional bus traffic, further fatigue bridge analysis is recommended to provide

Project Objectives	Summary of Findings / Recommendations
bridge/structure to accommodate buses	quantitative evidence to confirm the bridges' structural capacity.
Provide details including any associated costs to bring up the carriageway over the barrage to an acceptable standard for a bus link	The existing road over the embankment section is considered likely to be able to accommodate bus traffic since it already carries traffic including heavy vehicles. At the detailed design stage we would recommend highway cores be undertaken to establish roadbase thicknesses which will confirm any need for overlay or not. It is recommended that monitoring of the barrage roadway is increased in frequency from every 6 months to every 3 months. This will ensure that any problems with the road surface or the emergence of additional voids in the road construction are addressed quickly. Additional high-level street lighting on the bridge/sluice/embankment is not proposed, however, low level lighting alongside the on-road cycleway on the embankment section is recommended to be installed to increase general visibility of cyclists. This will require new cabling for power supply.
Liaise with Cardiff Council's Economic Development, ABP and Harbour Authority to investigate and agree the specification for the design and to understand the constraints and issues in the area as well as statutory undertakings	Consultation with stakeholders has been undertaken throughout the course of the Study – and meeting notes are presented in Appendix B.
Liaise with the Vale of Glamorgan to identify appropriate routes and bus priority and/or bus stop improvements	Liaison has been undertaken with Vale of Glamorgan Council staff – and established that the Council is supportive of the bus proposal (see Appendix B). It has been established that buses are able to travel between Penarth Centre and the barrage without the need for new bus infrastructure.

9.2 Operations and Management Summary

The key aspects of operational control and management to accommodate a bus service are set out in Table 9.2.

Table 9.2: Operations and Management Recommendations

Element	Recommendation
Bascule Bridge and Bus Service Scheduling	The sequencing of a scheduled bus service will need full co-ordination with barrage operations – which who control the timing of vessels entering and exiting Cardiff Bay. A review of the existing bascule bridge operation, relevant for a scheduled bus service, has identified that the 'maximum' practical bus service that could theoretically be operated robustly is a 30 minute frequency service, with a 'window' of opportunity' for vehicle movement across the lock/bridges structure of around 15-20 minutes every 30 minutes. For this schedule the roadway would be closed to traffic in line with the 'fixed' schedule for boat movement. It is clear however that there are likely to be occasions when vehicular access across the bascule bridges would be subject to delay due to unscheduled occurrences such as higher than normal boat movement, slow movement of boats through the locks, and reduced capacity of the locks during maintenance periods. It is therefore essential that the barrage operation includes for pro-active management of the movement of buses – although the schedule for boat movements will continue to take precedence. A revised operational H&S Plan will be required for the bridge / sluice operation.
Bus Service	A bus service operating twice every hour is considered to be the maximum feasible service. Maximising its usage and commercial viability would require the service to connect Penarth town centre and Cardiff City Centre. The provision of this service may require some re-organisation or revision to existing services e.g. bus services to Penarth and Cardiff Bay. The bus services timetable should be arranged such that buses in both directions reach the bascule bridges at approximately the same time. This should be feasible to arrange but may have an impact on the number of buses needed. It is recommended that the bus service schedule includes an alternative service route which avoids the barrage at periods when the barrage area is typically

Element	Recommendation
	very busy with pedestrians. This service would be operated on a pre-planned basis such that passengers are aware of the route to be taken prior to planning their journey (and would be shown on printed timetables). A suggested arrangement is that the alternative service diverts from the normal route at the Penarth end of the barrage, and then travels via Penarth Marina and the A4232 to Cardiff Bay, re-joining the normal route in the vicinity of Heol Porth Teigr. It may be necessary to operate this service on an hourly basis to allow the service to be operated with the same number of buses and drivers. It is noted that this alternative service route would provide a public transport link from Penarth and Cardiff for visitors to the barrage (even though it would not cross the barrage). It is recommended that the feasibility of operating a 4-bus / hour frequency is considered in future after a period of operating a 2-bus/hour service, at which time the operational interactions between the lock operations and bus services will be clearly understood. However, based on current lock operations, it is considered unlikely that a reliable 15 minute service would be feasible.
Barrage Operational Control Systems	The introduction of a scheduled bus service over the barrage provides an impetus to upgrade the control systems at the bascule bridges in particular, which could improve general operational capability as well as providing the means to manage movement of buses across the barrage. The control system upgrade would include incorporating automated access control bollards on the approaches to the bascule bridges – which provides an ability to hold all vehicles away from the bascule bridges prior to raising the bridges. A review of the current control systems should be undertaken to identify any shortfalls or upgrades required in their current systems, such as pedestrian warning devices, communication systems, vehicle identification systems etc. Undertaking an upgrade of the barrage control systems at the same time as introduction of the bus service is considered an essential component of de-risking the barrage bus proposal.

9.3 Key Next Steps

There are a number of recommended key next steps to enable the viability of a bus service over Cardiff Bay barrage to be further established.

9.3.1 Bridge and Embankment Structure Investigation

Structural investigations of the bascule bridges are necessary to confirm feasibility of the bus proposal. This would involve detailed inspections of the bridges to record their condition and identify the deck details. Strain gauges could then be installed at the critical locations, and the results from the strain gauges would be used to assess for both the fatigue and ULS capacity of the bridge decks.

It is also recommended that further efforts are made to locate the Health and Safety File for the bridge design, as this would provide information on the designed loads and design life of the structures, as well as a record of the inspections undertaken and a full set of as-built drawings. This could involve seeking to interview design staff involved in the original design work to gain background information which could assist in a risk assessment process.

In respect of the roadbase structure, it is possible that the road construction is not suitable for the level of use by heavy traffic which a bus service would entail. Hence, at the detailed design stage it will be is likely to be necessary to undertake some targeted roadbase cores to establish road construction thicknesses which will confirm any need for reconstruction or overlay or not.

At detailed design stage it will be necessary to review the embankment cross-section and the implications for vehicle containment in more detail (including undertaking a topographical survey of the embankment).

9.3.2 Bus and Lock Operation Virtual Test

It is recommended that a ‘virtual test’ is undertaken at the next stage in the development phase of the barrage bus project. For the test, pro-active management of the movement of ‘virtual’ buses would be undertaken while adhering to the normal lock opening schedule (that is, the test should not be based on a laissez-faire approach). The test should be undertaken for a whole day (or part of day) – ensuring that the boat movement on the day (or days) chosen is sufficient to enable conclusions to be drawn. This test could be based on either:

- Opening and closing the bridges to allow boats to pass through according to the standard lock schedule, and at the same time seeking to ensure that ‘virtual’ buses can pass through the bascule bridge section every half-hour according to a notional timetable.
- Operating a bus (without passengers) over the barrage according to a fixed notional timetable, while opening and closing the bridges to allow boats to pass through according to the standard lock schedule.

The test should be recorded in respect of timings and any delays, and a short report produced. A pre-cursor to on-site tests could be to produce a micro-simulation (using VISSIM software or similar) to simulate the current and future bascule bridge roadway operations (with buses and automated bollards).

9.3.3 Development and Land Use

It is important that steps are taken to integrate the barrage bus proposal in ongoing planning and negotiations in respect of development. It will be important to engage further with ABP in respect of the potential for buses to travel through ABP land.

9.3.4 Development of Preliminary Design to Detailed Design

In parallel to (or following) the above processes, it is recommended that elements of detailed design are progressed – with an initial need to prepare a topographical survey of the embankment and bridge sections. A detailed layout should then be prepared which sets out in detail the bollard control layout, shared space arrangement and associated signage (including rationalisation of all other signs), and modifications to cycle and pedestrian facilities – and lighting arrangements. This will enable cost estimations to be confirmed in more detail. In parallel to detailed design work, CDM and Road Safety Audit processes should proceed if the project is progressed from the outline design set out in this Report.

9.3.5 Development of Proposals for Bus Route

Following approval / acceptance of this Report, consideration should be given to investigating the route of a bus service and procurement method for a 30 minute frequency service e.g. how it connects to Cardiff City Centre, duplication with other services. This will enable a financial plan to be developed for operating the service, in particular in respect of operating costs. Fare revenue estimation will require an assessment of new passenger demand and demand transferred from existing services.

There will be a need to liaise with event operators to assess likely periods of ‘closure’ of the barrage to bus services – to both ensure that the need to implement the ‘alternative service’ route is minimised, and that periods of operating the alternative route are incorporated in a costed financial plan.

Appendix 14 Transport for Wales – Planned Future Works

Transport for Wales: Planned Future Works

The following details of planned future works is based on information received from Transport for Wales in May and July 2019.

Cogan Railway Station

Cogan is included in the Core Valley Lines (CVL) Transformation area and therefore a number of station improvements due to take place between October 2021 and June 2022, including:

- Painting and re-fresh & minor works
- shelter 'light' refurbishment
- Lighting
- CCTV
- Cycle racks
- CIS renewal
- CIS control
- help points
- PA system refurbishment
- cabling for customer information systems
- ticket validators

Dingle Road Railway Station

- New platform to be constructed- platform 2- down side
- Platform 1 improvements
- Full level boarding
- Painting and refresh, light shelter refurbs, CCTV, cycle racks, CIS renewals, help point renewals, PA equipment renewals, wi-fi

Penarth Railway Station

- New platform to be constructed- platform 2 down side
- Level boarding
- Painting and refresh, light shelter refurb, waiting room refurb, lighting units, CCTV, cycle racks, CIS renewals, help point renewals, PA equipment renewals, wi-fi

Vale of Glamorgan/Penarth Branch Lines

Retain the link from Penarth, Barry and Bridgend to destinations north of Cardiff Central using new tri-mode trains (overhead electric, battery and diesel) from December 2023, with a frequency of 2tph between Cardiff and Bridgend via Vale of Glamorgan from December 2023.

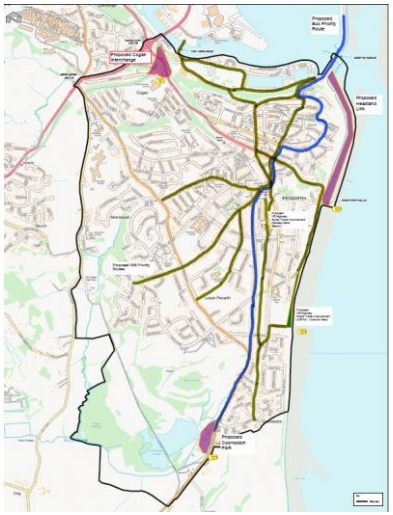
Appendix 15 Penarth Ecology Overview

Penarth - Ecological overview

Note.

This is an initial overview and any **habitats /** species potential can only be confirmed **during survey visits**. **Protected species records** will need to be acquired from the local biodiversity record centre and consultation with the Vale of Glamorgan County ecologist **/ Natural Resources Wales** will be required.

Figure 1. Proposed Penarth improvements.



Statutory site

There are two Nationally or Internationally important site (e.g. Sites of Special Scientific Interest (SSSIs)), Special Areas of Conservation (SACs)) lie within the 2 km search area. This includes the Severn Estuary and Cosmeston Lakes.

Severn Estuary - RAMSAR (Convention on Wetlands of International Importance especially as Waterfowl Habitat)

SEVERN ESTUARY (GLOUCESTERSHIRE, AVON, SOMERSET, SOUTH GLAMORGAN, MID GLAMORGAN, GWENT)

The Severn Estuary is one of the largest estuaries in Britain and it has the second largest tidal range in the world. Its classic funnel shape and south-west orientation makes it susceptible to extreme weather conditions in the east Atlantic. There are large urban developments on the estuary including the cities of Bristol and Cardiff.

The Severn Estuary qualifies under Criterion 1 of the Ramsar convention due to its immense tidal range exceeded only by that occurring in the Bay of Fundy, Canada. This tidal regime affects both the physical environment and the biological communities present in the estuary.
The Severn Estuary qualifies under Criterion 2b due to its unusual estuarine communities, reduced species diversity and high productivity. The high tidal range leads to strong tidal streams and high turbidity, producing communities characteristic of the extreme physical conditions of liquid mud and tide-swept sand and rock.

The estuary qualifies under Criterion 2c, as it is particularly important for the run of migratory fish between the sea and rivers via the estuary. Species using the estuary include salmon *Salmo solar,* sea trout *S. trutta,* sea lamprey *Petromyzon marinus,* river lamprey *Lampetra fluviatilis,* allis shad *A losa alosa,* twaite shad *A. fallax* and eel *Anguilla anguilla.* The population of the sea lamprey and twaite
shad are considered to be larger than in any other UK estuary. The rare and endangered allis shad is now only an occasional visitor although formerly a substantial spawning population was present.

The estuary also qualifies under Criterion 2c as it is particularly important for migratory birds during passage periods in spring and autumn. These large bird populations are supported by the rich food resources available in the tidal flats and nearby freshwater wetlands. During the five year period 1987/88 to 1991/92 the estuary supported nationally important numbers of ringed plover *Charadrius hiaticula* (spring migration: 442 birds (1.4% British passage), autumn migration: 1,573 birds (5.2% British passage)) dunlin *Calidris alpina* (spring: 3,510 birds (1.7% British passage), autumn 5,500 birds (2.7% British passage)) whimbrel *Numenius phaeopus* (spring: 246 birds (4.9% British
passage), autumn: 66 birds (1.3% British passage) and redshank *Tringa totanus* (autumn: 2,456 birds (2% British passage)).

The Severn Estuary qualifies under Criterion 3a by regularly supporting in winter over 20,000 waterfowl. In the five-year period 1988/89 to 1992/93 the average peak count was 68,026 waterfowl comprising 17,502 wildfowl and 50,524 waders.

The Severn Estuary qualifies under Criterion 3c by regularly supporting, during the same period, internationally important populations of five species of waterfowl. During the period the following average peak counts were recorded: 3,002 European white-fronted goose *Anser albifrons albifrons* (1.0% north-west European, 50.0% British wintering population), 2,892 shelduck *Tadorna tadorna* (1.2% NW European, 3.9% British), 330 gadwall *Anas strepera* (2.8% NW European, 5.5% British), 41,683 dunlin *Calidris alpina* (2.9% east Atlantic flyway (EAF), 9.6% British) and 2,013 redshank *Tringa totanus* (1.3% EAF, 2.6% British).

Notable also are nationally important wintering populations of wigeon *Anas penelope,* teal *Anas crecca,* pintail *Anas acuta,* pochard *Athya ferina,* tufted duck *Athya fuligula,* ringed plover, grey plover *Pluvialis squatarola,* curlew *Numenius arquata* and spotted redshank *Tringa erythropus.* Lesser black-backed gulls *Larus fuscus* breed within the proposed Ramsar site in nationally important numbers.

Severn Estuary - Sites of Special Scientific Interest (SSSI)

The Severn Estuary lies on the south west coast of Britain at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers. The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. The estuarine fauna includes: internationally important populations of waterfowl; invertebrate populations of considerable interest; and large populations of migratory fish, including the nationally rare and endangered Allis Shad (Alosa alosa). The SSSI forms the major part of a larger area of estuarine habitat, which includes the Upper Severn Estuary, the Taf/Ely Estuary and Bridgwater Bay.

The estuary has a diverse geological setting and a wide range of geomorphological features, especially sediment deposits. It is important for the interpretation of coastline dynamics and land-forms, and also past changes, in sea level, sediment supply, climate and river flow. The estuary's overall interest depends on its large size, and on the processes and inter-relationships between the intertidal and marine habitats and its fauna.

Beds of eel-grass *Zostera spp* occur on the more sheltered mud and sand banks. The estuary fringes have large areas of saltmarsh. These are generally grazed by sheep and/or cattle, a significant factor determining the plant communities. A range of saltmarsh types is present, with both gradual and stepped transitions between bare mudflat and upper marsh. Glassworts *Salicornia spp* and Annual Sea-blite *Suaeda maritima* colonise bare mud on the lower saltmarshes, and disturbed areas at higher levels. Common Cord-grass

Spartina anglica is abundant on the seaward fringes of marshes, where it occurs as dense monocultures, or with other species, such as Sea Aster *Aster tripolium*, Greater Sea-spurrey *Spergularia media* and Common Saltmarsh-grass *Puccinellia maritima*. The middle marsh is mainly dominated by Common Saltmarsh-grass, and frequent associates include Sea-milkwort *Glaux maritima*, English Scurvygrass *Cochlearia anglica* and Sea Arrowgrass *triglochin maritima*, together with two nationally scarce plants Bulbous Foxtail *Alopecurus bulbosus* and Slender Hare's-ear *Bupleurum tenuissimum*. There are a few localities for an uncommon middle marsh community, which is characterised by Sea-lavendar *Limonium vulgare* and Thrift *Armeria maritima*. Prominent species on the upper marsh are Red Fescue *Festuca rubra* and Saltmarsh Rush *Juncus gerardi*. Nationally scarce species occurring on the upper marshes include Sea Clover *Trifolium squamosum* and Sea Barley *Hordeum marinum*. Highly saline drying pans on the upper marsh support a community with abundant Reflexed Saltmarsh-grass *Puccinellia distans* and Lesser Sea-spurrey *Spergularia marina*. The highest saltmarsh around the driftline is usually dominated by Sea Couch *Elymus pycnanthus*, with Spear-leaved Orache *Atriplex prostrata*. Some brackish pools and depressions on the upper marshes have small stands of Common Reed *Phragmites australis* or Sea Club-rush *Scirpus maritimus*. Corn Parsley *Petroselinum segetum*, a European rarity, occurs within the site.

The fluctuating salinity and highly mobile sediments with consequent high turbity limits the benthic invertebrates to relatively few species. Those which are tolerant of such conditions occur in very high densities on the more stable mudflats. The most prominent species are ragworm *Nereis spp*, Lugword *Arenicola marina*, Baltic Tellin *Mocoma balthica* and the spire shell *Hydrobia ulvae*. A greater variety of invertebrates tend to occur on the intertidal rock platforms, a more stable habitat with rock pools and a relatively high cover of seaweeds.

Seven species of migratory fish move through the Estuary between the sea and rivers. There are particularly large numbers of Atlantic Salmon *Salmo salar* and Common Eel *Anguilla anguilla*. The other species are Allis Shad, the nationally rare Twaite Shad *Alosa fallax*, the Sea Trout *Salmo trutta*, Sea Lamprey *Petromyzon marinus* and the Lampern or River Lamprey *Lampetra fluviatilis*.

The SSSI is of international importance for wintering and passage wading birds, with total winter populations averaging about 44,000 birds. Numbers can be considerably higher during severe winters when owing to its mild climate, the Severn supports wader populations that move in from the colder coasts of Britain. The SSSI holds most of the estuary's internationally important Curlew *Numenius arquata* and Redshank *Tringa totanus* populations, and most of its nationally important Ringed Plover *Charadrius hiaticula* and Grey Plover *Pluvialis squatarola* populations. Other waders which occur in significant numbers within the SSSI are Common Snipe *Gallinago gallinago*, Knot *Calidris canutus*, Whimbrel *Numenius phaeopus* and Turnstone *Arenaria interpres*. The SSSI is internationally important for Dunlin *Calidris alpina* and supports about 7.5% of the British wintering population of this species. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of Dunlin in Britain.

In late winter and early spring the SSSI supports nationally important numbers of Shelduck *Tadorna tadorna*, following the partial dispersal from their moulting grounds in Bridgewater Bay. There are also significant numbers of Wigeon *Anas penelope*.
Remarks

The Severn Estuary SSSI forms part of a larger area which includes the Upper Severn Estuary SSSI and Bridgwater Bay SSSI. The larger area of the Severn Estuary is designated a Special Protection Area under the 'EEC Wild Birds Directive' and a Wetland of International Importance under the Ramsar Convention

Severn Estuary - Special Area of Conservation (SAC)

SEVERN ESTUARY HABITAT TYPES AND/OR SPECIES FOR WHICH THE SITE IS DESIGNATED (SAC)		
	Common Name	**Scientific term**
1	Twaite shad	*Alosa fallax*
2	Atlantic salt meadows	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
3	Estuaries	Estuaries
4	River lamprey	*Lampetra fluviatilis*
5	Intertidal mudflats and sandflats	Mudflats and sandflats not covered by seawater at low tide
6	Sea lamprey	*Petromyzon marinus*
7	*Reefs*	*Reefs*
8	Subtidal sandbanks	Sandbanks which are slightly covered by sea water all the time

Severn Estuary – Special Protection Area (SPA)

See RAMSAR description above.

EC Directive 79/409 on the Conservation of Wild Birds.

Cosmeston Lakes SSSI

Cosmeston Lakes is situated 2km south of Penarth. It includes two lakes, created from flooded limestone quarries, which are connected by a narrow channel. These are deep (up to 10m), eutrophic water bodies, which support a range of submerged plants. One of the lakes is of special interest as the only known site in Wales for the presence of starry stonewort *Nitellopsis obtusa*. This species usually grows in lakes of between 1m and 6m in depth. Elsewhere in Britain it occurs in the Norfolk Broads and in Gloucestershire, where it is found in calcareous lakes near the sea. This suggests that the species prefers slightly brackish conditions. The lakes at Cosmeston Park are less than 1.5km from the Bristol Channel. The site also includes areas of swamp, ponds and grassland that form part of the water catchment area for the lake.

Non-statutory Sites

Site of Importance for Nature Conservation (SINC)

There is no SINC information at this stage. SINC information should be obtained **through the local biological records centre / consultation with the VoG ecologist.**

Local Nature Reserve

In addition to being a SSSI Cosmeston lakes and Country Park also holds a Local nature reserve status. This area is known to support bats, otters, a variety of birds, great crested newts, reptiles, fish and invertebrates. It may have the potential to support species such as dormice and badger.

Ancient and semi natural woodland

Areas of Ancient and semi natural woodland including Downs Wood (ST 17774 69740) and Cogans plantation (ST 16944 69364). These wooded areas have the potential to support bats, breeding birds, badgers, dormice (and great crested newts during terrestrial periods).

Historic parks, gardens and quiet areas

The following green spaces have the potential to provide shelter and foraging for bats, hedgehogs, birds, amphibians, reptiles and possibly badgers.

- Victoria playing fields (ST 17778 71579)
- Golden Gates, Coleridge Avenue quiet area (ST 17868 71727)
- Windsor Gardens (ST 18807 71042)
- Alexandrea Park (ST 18660 71413)
- Belle Vue Park (ST 18686 71986)
- Penarth Head Park (ST 19071 71865)
- Windsor Road Dingle (ST 17885 72065)
- St Josephs Park (ST 18095 72321)
- Penarth Marina Park (ST 18084 72487)

Other Sites

Railway Walk

The railway walk is located at the southern part of the site between Birch Lane and Cosmeston Drive (central grid reference: ST 18351 69696).

This location has potential to provide shelter and foraging opportunities for bats, birds, badgers, hedgehogs and possibly reptiles and amphibians.

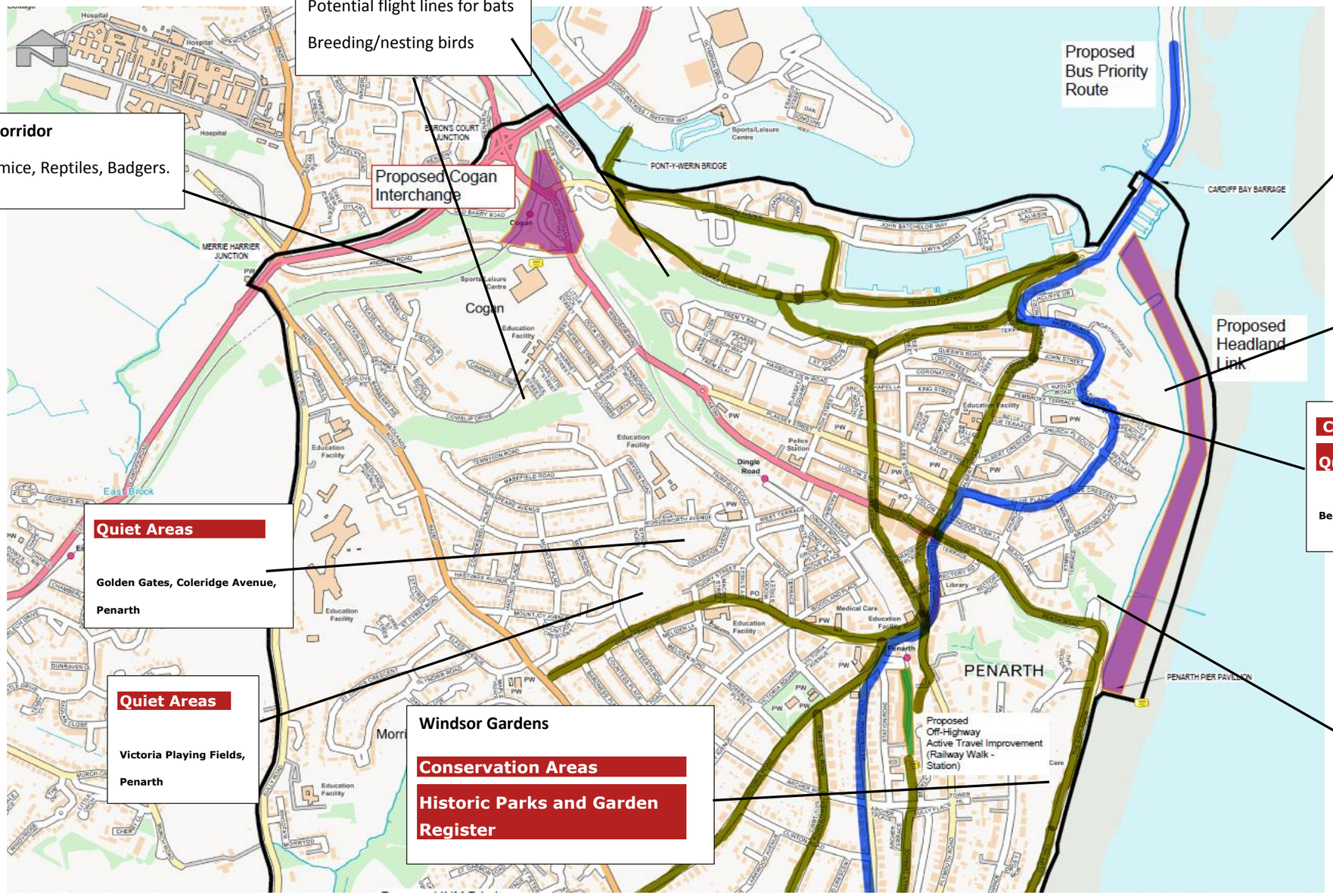
Railway corridor

The railway corridor located to the northern part of the site has the potential to provide shelter and foraging opportunities for bats, birds, dormice, badger and reptiles.

Recommendations

- Desktop study
- Preliminary Ecological Assessment (PEA) **(to inform the requirement for targeted ecological surveys).**
- Any proposed works or plans that could potentially affect the Severn Estuary SAC/SPA/RAMSAR will need to undergo a Habitats Regulations Assessment in accordance with the Conservation of Habitats and Species Regulations 2017.

Penarth – Ecological overview



Tree line

Potential flight lines for bats

Breeding/nesting birds

Railway corridor

Bats, Dormice, Reptiles, Badgers.

Severn Estuary

RAMSAR, SSI, SAC, SPA

Coastal birds

Marine life

Conservation Areas

Penarth

Quiet Areas

Penarth Head Lane

Conservation Areas

Quiet Areas

Belle Vue Park, Penarth

Quiet Areas

Golden Gates, Coleridge Avenue, Penarth

Quiet Areas

Victoria Playing Fields, Penarth

Windsor Gardens

Conservation Areas

Historic Parks and Garden Register

Conservation Areas

Historic Parks and Garden Register

Quiet Areas

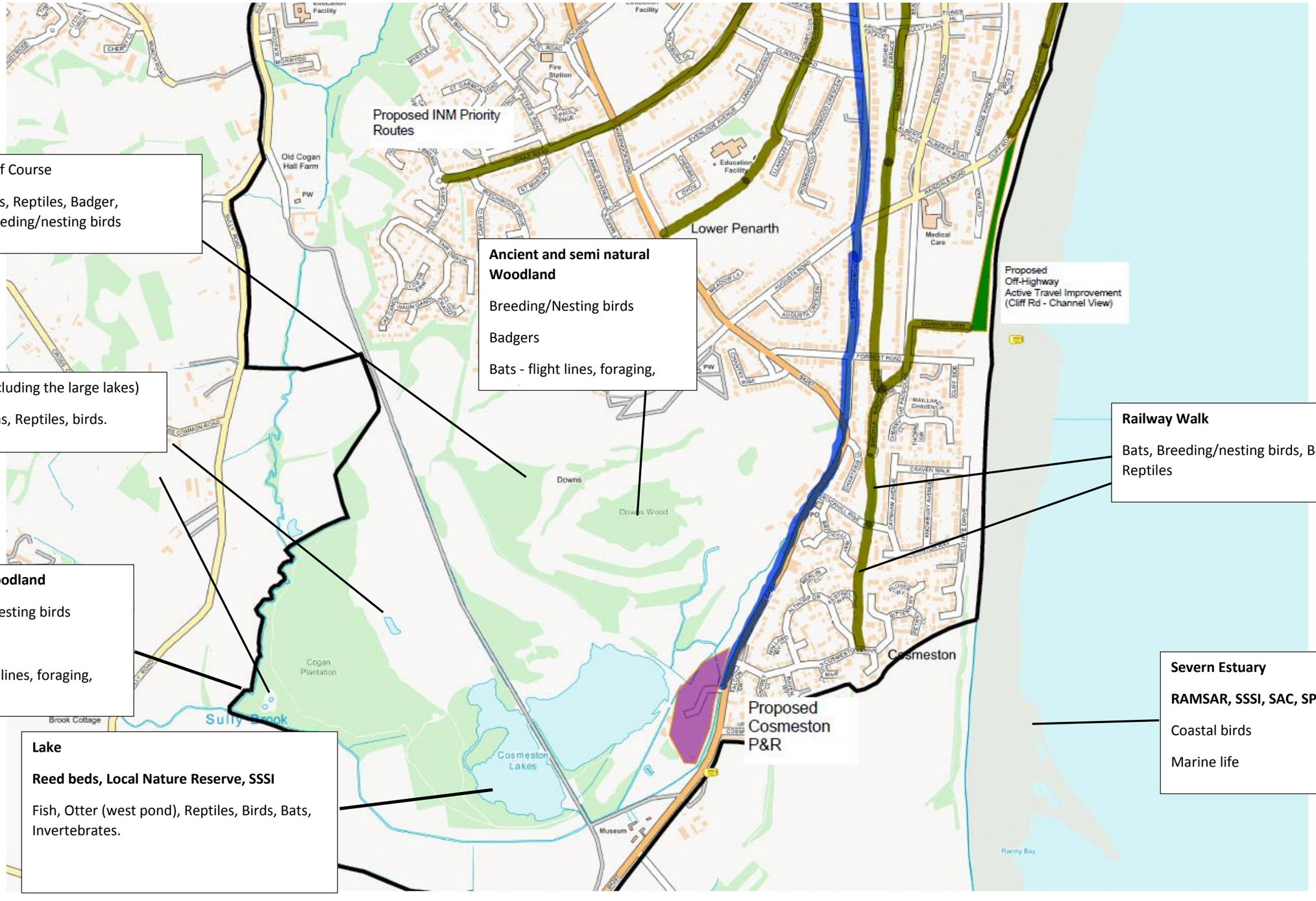
Alexandra Park, Penarth

Note

This is an initial overview and any habitats **/** species potential can only be confirmed **during survey visits**.

Protected species records will need to be acquired from the local biodiversity record centre and consultation with the Vale of Glamorgan County ecologist / Natural Resources Wales will be required.

Penarth – Ecological overview



NRW Water Vole Press Release. Retrieved 16th August 2019, from:

Water vole release marks end of four year project

11 Jun 2019

Natural Resources Wales (NRW), along with Vale of Glamorgan County Council, has completed a four year reintroduction project after recently releasing the last batch of water voles to a lake.

Water voles are a protected species in the UK and in 2015 a programme began to re-introduce them around Cosmeston Lakes, Penarth, to turn the tide against extinction in the Vale of Glamorgan.

NRW started releasing captive bred water voles in 2017 after two years of planning and work to reduce their number one predator, mink.

Since then 400 voles have been released at Cosmeston with their population expected to flourish.

Water voles are an important species in the food chain, supporting many predators, such as birds of prey, stoats and herons. Their burrowing activity also boosts the nitrogen cycle, improving plant growth.

The voles have been bred at NRW's hatchery in Cynrig and released into the wild once they're old enough to fend for themselves.

Sibling groups of water voles are placed in temporary pens in the new habitat for up to five days to become accustomed to the new smells, sounds and sights.

The voles can then move out when they're ready.

However, some larger animals separated from their siblings in captivity are often released straight into the wild.

Richard Davies, fish culture officer for NRW, said:

"Wildlife is an important part of our environment, our heritage and our culture in Wales, which is why protecting Wales' most endangered species is so important.
"Water vole habitat in South Wales is quite fragmented, however there are pockets of excellent habitat like Cosmeston. Unfortunately, sites like this are unlikely to be colonised naturally which is why reintroduction projects are so important.
"Cosmeston receives up to 300,000 visitors a year, each of which have every chance of spotting our water voles in the wild, making these the most viewed water voles in Wales.
"I'd like to give a big thanks to our project partner, the Vale of Glamorgan Council and the volunteers who have helped us over the years, creating great habitat and providing protection for this wonderful species."
As a protected site, Cosmeston Lakes benefits from a joint effort from NRW and Vale of Glamorgan Council to managing its natural resources to create a healthier and more resilient environment for the rich and diverse wildlife that lives there.

The water voles are expected to disperse out of Cosmeston Lakes as their numbers grow, potentially populating sections of the Sully Brook, Sully moors and any habitable stretches of the Cadoxton river catchment.

Appendix 16 Review of Environmental Considerations

Review of Environmental Considerations

Option 1 – Active Travel Proposals for the Penarth Cardiff Barrage Corridor

Penarth Headland Link (other Active Travel proposals considered separately)			**Source**
Air Quality	Air Quality Management Areas (AQMAs)	There are no AQMAs within 1km of the proposed Headland Link.	DEFRA
	Sensitive Receptors within the area	Within the vicinity of the proposed Headland link, there are a number of receptors that may be sensitive, including: • The Custom House restaurant (Paget Rd); • Residential dwellings at Penarth Marina; • Boats (if used for accommodation) at Penarth Marina; • Residential dwellings around Penarth Head; • Headlands School; • Saint Augustine's Church; • The Kymin; • Penarth Pier Pavillion; • Residential dwellings around Penarth Esplanade; and • Restaurants/Cafes at Penarth Esplanade (it is likely any active travel improvements may benefit the air quality of these receptors).	Desktop study
Cultural Heritage	World Heritage Sites	There are no World Heritage Sites within 1km of the proposal.	CADW
	Scheduled Monuments	Within 1km of PHL: • Penarth Churchyard Cross (now in St Augustine's Church).	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Listed Buildings	Within 1km of PHL: • Customs House; • Marine Buildings; • Headlands School; • St Augustine's Church; • Telephone Call-Box at junction with Church Avenue; • Cenotaph (Alexandra Park); • Penarth Pier (including Pavilion and Shops); • Telephone call-box in front of Pier; • Former Penarth Baths and Supervisor's Office; • Piermaster's Lodge; and • Penarth Yacht Club House.	CADW
	Historic Parks, Gardens and Quiet Areas	The Penarth Headland Link does not run through any Historic Parks and/or Gardens. Consideration may have to be given to an area identified within a high-level study as a green space that may have potential to provide shelter and foraging for bats, hedgehogs, birds, amphibians, reptiles and possibly badgers. Relevant identified area: • Penarth Head Park It is noted that there is a significant levels difference between the Head Park and the proposed Penarth Headland Link.	Desktop study. Initial ecological overview.
	Conservation Areas	The Penarth Headland Link runs across an area covered under the Penarth Conservation Area Boundary (part of the proposed route).	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
Landscape	National Parks	The proposal is not within the vicinity of any national park.	Ordnance Survey

	Areas of Outstanding Natural Beauty (AONB's)	The proposal is not within the vicinity of any AONB.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Visual Receptors	• View from Penarth Pier/Cliff Parade Walk; • View from properties on Headland (would be significant difference in levels); • Vessels in the Bristol Channel; and • View from Barrage across to Penarth Headland.	Desktop study
	Topography	The PHL route travels around a cliff and is therefore considerably lower than surrounding properties located around Penarth Head (according to the ESRI ArcGIS layer, properties around Penarth Head closest to the cliff are 60m above sea level. The route itself likely to be flat although the projection would require consideration of potential debris from cliff-fall (which has been taken into account in previous Headland Link studies).	Desktop study
	Features of Local Importance	The Penarth Headland Link may significantly alter the current view from Penarth Pier and Esplanade (if facing North), and the view of Penarth Head if viewed from the Barrage.	Desktop study
Nature Conservation	European Designated Sites	The proposed PHL route runs close to/through (depending on exact routing) a Habitats Directive Site (pSCI/SCI or SAC), as well as a Bird Directive Site (SPA). The area is also a Habitat/Species Management Area.	European Environment Agency
	Sites of Special Scientific Interest	The proposed PHL route runs through the Severn Estuary SSSI.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	National/Local Nature Reserves	The proposed PHL route is not within an area designated as a national or local nature reserve.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Sites of Importance for Nature Conservation	There is no SINC information at this stage. SINC information should be obtained through the local biological records centre/consultation with the Vale of Glamorgan Ecologist.	Initial ecological overview
	Potential Habitat constraints/opportunities	No particular constraints/opportunities were identified in respect of this option at this stage, though it is recommended that a Desktop Study, Preliminary Ecological Assessment and, if applicable, a Habitats Regulation Assessment in accordance with the Conservation of Habitats and Species Regulations 2017 for any of the progressed options.	Initial ecological overview
Geology and Soils	Geological Designations	According to a previous Geotechnical Study, the upper sections of the beach are made up of sand, gravel, cobbles and boulders (mostly from the adjacent cliff). Along the proposed link route, the underlaying geology is mostly Mercia Mudstones and at the Penarth Fault where the Blue Anchor Formation outcrops. A Cliff Stability Assessment highlights an evidence of build up of debris along the cliff extending a few metres from the base of the cliff, as well as evidence of larger slips to the area South of Penarth Head.	Previous geotechnical study (ARUP, 2018)
	SSSI's designated for geological attributes	No information available at present.	

Noise and Vibration	Sensitive Receptors	Receptors that may be sensitive to works include: • Properties along route to/from Barrage required for construction; • Custom House Restaurant; • Penarth Pier Pavilion; • Residential Properties at Penarth Esplanade; • Headlands School; and • Residential Properties on Penarth Head.	Desktop study
Road Drainage and the Environment	Watercourses and Waterbodies	Bristol Channel; River Taff; and River Ely.	Natural Resources Wales
	Flood Zones, Aquifers and Source Protection Zones	The proposed PHL route is entirely located within flood zone C2. No information on aquifers or source protection zones is available at present.	Natural Resources Wales
Other Considerations	Stakeholder consultation has highlighted the potential impact of a future drift reversal (most recently occurred in late 1990s), which will impact on coastal area/beach to the west of the PHL and have coastal protection/cost implications. Need to ensure any modelling forecasts that have been developed include current climate change/sea level forecasts. Risk and timescales involved in obtaining NRW consent. PHL could benefit the protection of a Welsh Water structure/asset that requires coastal protection. Stakeholder consultation has highlighted that the PHL could be viewed as going against the Shoreline Management Plan policy of 'Hold the Line' for the area (i.e. no active intervention where there are no defences). If considered as going against the policy, then could require Minister sign-off (potential impact on timescale).		WelTAG Stage One and Two public and stakeholder workshops. Existing studies.

Active Travel Improvements (not including Penarth Headland Link)			**Source**
Air Quality	Air Quality Management Areas (AQMAs)	There are no AQMAs adjacent to any proposed improvements (although an AQMA has previously been in place along the A4160 Windsor Road)	DEFRA/VOG informed AQMA lifted
	Sensitive Receptors within the area	Proposed routes are adjacent to a mix of land use types, including retail, residential and schools. Some of the proposed routes pass through the Town Centre.	Desktop study
Cultural Heritage	World Heritage Sites	There are no World Heritage Sites within 1km of the proposals.	CADW
	Scheduled Monuments	Adjacent to any proposed Active Travel improvement (note: works are expected to be minor and may benefit Scheduled Monuments in the longer term): • Penarth Churchyard Cross (now in St Augustine's Church); and • Cogan Deserted Medieval Village.	Lle Geo-Portal (Welsh Government)
	Listed Buildings	Adjacent to any Proposed Active Travel Improvement: • School House (Albert Road); • County Infants School (Albert Road); • Telephone call-box on Albert Road Gardens; • Pillar Box (Albert Road); • Post Office (Albert Road); • Windsor Arcade Building; • Bank on corner of Albert Rd & Windsor Road; • Public Library (Stanwell Rd); • Marine Buildings; • Customs House; • Telephone call box Stanwell Rd/Plymouth Rd junction; • Turner House Art Gallery; • 1 – 10 Plymouth Road; • Telephone call box (outside Royal Buildings); • Paget Rooms; • All Saints Parish Hall; • St Anne's, Victoria Road; • St Margaret's, Victoria Road; • 24/25 Archer Road; • The Red House, Victoria Road; • Sea Roads, Cliff Parade; • Penarth Pier/Pavillion; • Telephone box outside Pier; • Piermaster's Lodge; and • Penarth Baths and Supervisor's Office.	CADW
	Historic Parks, Gardens and Quiet Areas	There are no parks or gardens listed as having historical significance in the study area. However, the desktop ecological study has identified a number of green spaces have the potential to provide shelter and foraging for bats, hedgehogs, birds, amphibians, reptiles and possibly badgers. Relevant areas to this part of the proposals include: • Victoria Playing Fields; • Alexandra Park; • Windsor Gardens; • Penarth Marina Park; and • St Joseph's Park. As most proposals are on-highway, it is not expected that any of the interventions would negatively impact upon these green spaces.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)

	Conservation Areas	Some of the proposed Active Travel improvements run within an area covered under the Penarth Conservation Area Boundary.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
Landscape	National Parks	The proposal is not within the vicinity of any national parks.	Ordnance Survey
	Areas of Outstanding Natural Beauty (AONB's)	The proposal is not within the vicinity of an AONB.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Visual Receptors	Many of the proposed routes are lined by properties of a variety of land uses, including residential, retail, education and leisure.	Desktop study
	Topography	Topographical constraints. Choice of 2 routes between Paget Rd and Penarth Town The routes along Beach Road and Paget Road may prove challenging for Active Travel users due to the steep gradients.	Desktop study/WelTAG Stages 1 and 2 stakeholder and public workshops.
	Features of Local Importance	Features of local importance that should be considered as part of any highway improvements include: • Trees adjacent to highway at various locations within Penarth; • Statue located on roundabout at north end of Paget Road; • Clock located on roundabout at junction of Windsor Rd/Albert Rd/Windsor Terrace/Stanwell Road junction; and • Victorian lampposts adjacent to highway (locations, if still in use, to be determined).	Desktop study/WelTAG Stages 1 and 2 stakeholder and public workshops.
Nature Conservation	European Designated Sites	The proposed Active Travel improvements do not run through any European Designated Sites.	European environment agency
	Sites of Special Scientific Interest	The proposed Active Travel improvements do not run through an area designated as a SSSI.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	National/Local Nature Reserves	The proposed Active Travel routes are not within an area designated as a national or local nature reserve.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Sites of Importance for Nature Conservation	Not available at present. SINC information should be obtained through the local biological records centre and consultation with the Vale of Glamorgan ecologist.	Initial ecological overview
	Potential Habitat constraints/opportunities	No particular constraints/opportunities were identified in respect of this option at this stage, though it is recommended that a Desktop Study, Preliminary Ecological Assessment and, if applicable, a Habitats Regulation Assessment in accordance with the Conservation of Habitats and Species Regulations 2017 for any of the progressed options.	Initial ecological overview
Geology and Soils	Geological Designations	No information at present.	N/A
	SSSI's designated for geological attributes	No information at present.	N/A
Noise and Vibration	Sensitive Receptors	Sensitive Receptors adjacent to any proposed improvements include: • Properties of various uses alongside the routes • Loading movements for retail/leisure uses, particularly along Hickman Rd/Stanwell Rd/Windsor Road	Desktop study
Road Drainage and the Environment	Watercourses and Waterbodies	No new direct crossings of waterbodies as part of the proposed INM improvements within the study area (for routes not including the Headland Link).	Desktop study

	Flood Zones, Aquifers and Source Protection Zones	Part of the proposed improvements to routes are within flood zone B. The majority of routes follow the existing highway network with existing drainage provision. Any new construction will take SUDs regulations into account. No information on aquifers or source protection zones is available at present.	Natural Resources Wales
Other Considerations	The majority of proposed routes follow the existing highway network, only small sections of the proposed routes will require new construction outside the existing highway boundary. The proposed routes aim to increase levels of walking and cycling and have a positive impact on the Town Centre environment.		N/A

Option 2 – Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

Cosmeston Park and Ride			**Source**
Air Quality	Air Quality Management Areas (AQMAs)	There are no AQMAs within the vicinity of the proposed Park and Ride site at Cosmeston.	DEFRA
	Sensitive Receptors within the area	• Cosmeston Lakes Visitor Centre and Café; • Visitors to Cosmeston Lakes; and • Properties adjacent to Lavernock Road.	Desktop study
Cultural Heritage	World Heritage Sites	There are no World Heritage Sites within 1km of the proposal.	CADW
	Scheduled Monuments	There are no Scheduled Monuments within vicinity of the site.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Listed Buildings	There are no Listed Buildings within vicinity of the site.	CADW
	Historic Parks and Gardens	Not designated as a historic park or garden (please also see features of local importance).	Desktop study
	Conservation Areas	The proposed Cosmeston Park and Ride is not currently within a conservation area.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
Landscape	National Parks	The proposal is not within the vicinity of any national park.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Areas of Outstanding Natural Beauty (AONB's)	The proposal is not within the vicinity of any AONB.	Lle Geo- Portal (Welsh Government/Natural Resources Wales)
	Visual Receptors	Cosmeston Visitor Centre & Café Properties adjacent to Lavernock Road & along Falcon Grove.	Desktop study
	Topography	The topography of the current and proposed Cosmeston Park and Ride site is fairly level (with the site being between approximately 36ft and 44ft above sea level).	Desktop study (via http://en-gb.topographic-map.com/places/Wales-78899/)
	Features of Local Importance	Cosmeston Lakes is regularly used for leisure and recreational purposes. The park and medieval village are also important for wildlife, local history and educational opportunities.	Vale of Glamorgan Council
Nature Conservation	European Designated Sites	The proposed Cosmeston Park and Ride site sits within an area covered under the maps.eea.europa.eu site as "Other (not assigned, not applicable or not reported)"; the area immediately around and including the nearby lakes is designated as a habitat/species management area.	European Environment Agency
	Sites of Special Scientific Interest	The proposed Cosmeston Park and Ride site is not within an area designated as an SSSI, though the Cosmeston Lakes is a designated SSSI area.	Lle Geo- Portal (Welsh Government/Natural Resources Wales)
	National/Local Nature Reserves	The proposed Park and Ride site is within an area designated as a Local Nature Reserve.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Sites of Importance for Nature Conservation	Not available at present. SINC information should be obtained through the local biological records centre and consultation with the Vale of Glamorgan ecologist.	Initial ecological study
	Potential Habitat constraints/opportunities	Cosmeston Lakes Country Park, the location for the proposed Park and Ride, is designated an SSSI. Within the park's boundaries there is an area of ancient and semi natural woodland, large lakes (which are likely to house fish, otters, reptiles, birds, bats and invertebrates) and ancient and semi-natural woodland, likely to house breeding/nesting birds, badgers and bats. In addition to the above, Water Voles have recently	Initial ecological study

		been re-introduced at Cosmeston Lakes. The initial ecological study also recommended that an ecological desktop study, Preliminary Ecological Assessment and, if applicable, a Habitats Regulations Assessment is undertaken for any progressed options.	
Geology and Soils	Geological Designations	No information present	N/A
	SSSI's designated for geological attributes	No information present	N/A
Noise and Vibration	Sensitive Receptors	• Cosmeston Lakes Medieval Village; • Cosmeston Lakes Visitor Centre & café; • The Glamorganshire Golf Club; and • Residential properties adjacent to Lavernock Road.	Desktop study
Road Drainage and the Environment	Watercourses and Waterbodies	Cosmeston Lakes; and Local drainage within the vicinity of the current car park area.	Desktop study
	Flood Zones, Aquifers and Source Protection Zones	The proposed site of the Park and Ride is located within either flood zone C2, or flood zone B (depending on layout of car park). No information on aquifers or source protection zones is available at present.	Natural Resources Wales
Other Considerations	Importance of the site as a leisure and tourism destination.		WelTAG Stages One and Two public/stakeholder workshops

Bus Priority Route (via Westbourne Road)			**Source**
Air Quality	Air Quality Management Areas (AQMAs)	There are no AQMAs adjacent to any proposed bus priority improvements.	DEFRA
	Sensitive Receptors within the area	• Residential properties line much of route proposed (particularly north and south of the Town Centre); • Shops/Restaurants along Victoria Road; • Westbourne School; • Shops along Stanwell Road; • Penarth Library; • Headlands School; and • Custom House Restaurant at Barrage.	Desktop study
Cultural Heritage	World Heritage Sites	There are no World Heritage Sites within 1km of the proposal.	CADW
	Scheduled Monuments	Adjacent to proposed bus priority route (via Westbourne Road): • Penarth Churchyard Cross (now in St Augustine's Church).	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Listed Buildings	Adjacent to proposed bus priority route (via Westbourne Road): • Paget Rooms; • Telephone call-box outside Royal Buildings; • Library (Stanwell Road); • Bank (at junction of Windsor Road & Albert Road); • Post Office (Albert Road); • Pillar Box outside Post Office; • Telephone call-box at corner of Church Avenue; • St Augustine's Parish Church; • Headlands School; • Customs House; and • Marine Buildings.	CADW
	Historic Parks, Gardens and Quiet Areas	The route does not run adjacent to any historic parks or gardens.	Desktop Google Maps
	Conservation Areas	Some of the proposed bus priority route runs within the Penarth Conservation area.	Lle Geo-Portal
Landscape	National Parks	The proposal is not within the vicinity of any national park.	Ordnance Survey
	Areas of Outstanding Natural Beauty (AONB's)	The proposal is not within the vicinity of any AONB.	Lle Geo-Portal
	Visual Receptors	A number of properties, with various land usage (including education, residential and retail) line the proposed route and may be affected visually by features built as part of engineering features implemented as part of bus priority measures.	Desktop study
	Topography	The Bus Priority route is proposed to travel from Cosmeston (approx. 40ft above sea level) to the Barrage (approx. 15ft above sea level). The highest point of the route is approximately 220ft around Penarth Head. This geography requires a steep climb for buses travelling from the Barrage up Paget Road, but is currently used by an operating service so is deemed suitable for use by buses. There is anecdotal evidence received from bus operators that an alternative route is not suitable due to driver's positioning within the cab restricting views of a junction in the Paget Road area (exact location to be determined).	Desktop study (via http://en-gb.topographic-map.com/places/Wales-78899/) Cardiff Bus operator
	Features of Local Importance (Other)	Features of local importance that should be considered as part of any highway improvements include: • Trees adjacent to highway at various locations within Penarth; • Statue located on roundabout at north end of Paget Road; • Clock located on roundabout at junction of Windsor Rd/Albert Rd/Windsor Terrace/Stanwell Road junction; and • Victorian lampposts adjacent to highway (locations, if still in use, to be determined).	Desktop study & WelTAG Stages 1 and 2 public/stakeholder workshops
Nature Conservation	European Designated Sites	The proposed Bus Priority route (with the exception of Cosmeston access/egress) does not run through any European Designated Sites.	European Environment Agency

	Sites of Special Scientific Interest	The proposed Bus Priority route does not run through an area designated as an SSSI.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	National/Local Nature Reserves	With the exception of Cosmeston Lakes ingress/egress, the proposed bus priority routes are not within any area designated as a local or national nature reserve.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Sites of Importance for Nature Conservation	Not available at present. SINC information should be obtained through the local biological records centre and consultation with the Vale of Glamorgan ecologist.	Initial ecological overview
	Potential Habitat constraints/opportunities	No particular habitat constraints/opportunities were identified in respect of this option at this stage, though it is recommended that a Desktop Study, Preliminary Ecological Assessment and, if applicable, a Habitats Regulation Assessment in accordance with the Conservation of Habitats and Species Regulations 2017.	Initial ecological overview
Geology and Soils	Geological Designations	No information at present.	
	SSSI's designated for geological attributes	No information at present.	
Noise and Vibration	Sensitive Receptors	Properties adjacent to proposed bus priority routes, particularly sensitive receptors may include Headlands School, Victoria Road shops, Stanwell Road shops and Penarth Library.	Desktop study
	Community and Private Assets	Adjacent land uses along route include: • Residential (primarily); • Educational; • Retail; and • Leisure.	Desktop study
Road Drainage and the Environment	Watercourses and Waterbodies	It is not envisaged that any waterbodies/courses will be affected by the proposed route between Cosmeston and the Barrage as the proposed bus routes run along the existing road network, and associated drainage is already in place.	Natural Resources Wales
	Flood Zones, Aquifers and Source Protection Zones	Access/egress to/from Cosmeston Lakes is within a flood zone (with different points of the access route covered by zones B and C2). No other part of the route through Penarth is covered by a flood risk zone. No information on aquifers or source protection zones is available at present.	Natural Resources Wales
Other Constraints	There would be limited construction impact outside of the highway boundary and the majority of changes to the network would be required within the existing highway.		Desktop study

Bus route across Cardiff Barrage			**Source**
Air Quality	Air Quality Management Areas (AQMAs)	There are no AQMAs adjacent to the proposed bus route across the Barrage.	DEFRA
	Sensitive Receptors within the area	• Current/Potential users of Barrage; • Events held on the Barrage; • Shipping movements into/out of/around Barrage; • Custom House; and • Businesses in Cardiff Bay.	Desktop study
Cultural Heritage	World Heritage Sites	There are no World Heritage Sites within 1km of the proposal.	CADW
	Scheduled Monuments	Within 1km of Cardiff Bay Barrage: • Penarth Churchyard Cross (now in St Augustine's Church); • Ely Tidal Harbour Coal Slaithe Number One; and • Queen Alexandra Dock Harbour Defense Gun Emplacement.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Listed Buildings	Adjacent to Barrage: • Custom House; and • Marine Buildings.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Historic Parks, Gardens and Quiet Areas.	The route does not run adjacent to any historic parks, gardens or quiet areas identified within the initial ecological overview (see 'Potential Habitat constraints/opportunities' for ecological recommendations).	Initial ecological overview
	Conservation Areas	The Barrage Bus Route does not currently intercept any conservation area.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
Landscape	National Parks	The proposal is not within the vicinity of any national park.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Areas of Outstanding Natural Beauty (AONB's)	The proposal is not within the vicinity of any AONB.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Visual Receptors	Visual receptors along the route include: • Existing users of the Barrage (e.g. walkers/cyclists); • Vessels using the Bay; and • Associated British Port Buildings.	Desktop study
	Topography	The topography of the Barrage route is flat.	Desktop study (via http://en-gb.topographic-map.com/places/Wales-78899/)
	Features of Local Importance	The Barrage is viewed as a locally significant landmark, running buses across the Barrage may impact upon the attractiveness of this feature.	Desktop study, WelTAG Stages 1 and 2 public/stakeholder workshops.
Nature Conservation	European Designated Sites	The proposed Barrage Bus route does not run through any European Designated Sites.	European Environment Agency
	Sites of Special Scientific Interest	The proposed Barrage Bus route does not run through any areas designated as a SSSI.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	National/Local Nature Reserves	The proposed Barrage Bus route does not run through any national or local nature reserves.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Sites of Importance for Nature Conservation	Not available at present. SINC information should be obtained through the local biological records centre and consultation with the Cardiff Council ecology department.	Initial ecological overview
	Potential Habitat constraints/opportunities	No particular constraints/opportunities were identified in respect of this option at this stage, though it is recommended that a Desktop Study, Preliminary Ecological Assessment and, if applicable, a Habitats	Initial ecological overview

		Regulation Assessment in accordance with the Conservation of Habitats and Species Regulations 2017.	
Geology and Soils	Geological Designations	Likely not an issue for the part of the route that follow the existing highway network, though the exact route is still to be determined.	Desktop study
	SSSI's designated for geological attributes	No information at present.	N/A
Noise and Vibration	Sensitive Receptors	Sensitive Receptors may include: • Existing Barrage users (e.g. walkers/cyclists); • Vessels using the Bay; • Marine life within the Bay/Channel; and • Associated British Ports movement(s).	Desktop study. WelTAG Stages 1 and 2 public/stakeholder workshops.
Road Drainage and the Environment	Watercourses and Waterbodies	Watercourses/Waterbodies in the vicinity include: • Bristol Channel; • River Taff; • River Ely; • Roath Dock; • Queen Alexandra Dock; • Drain adjacent to Cargo Road; and • Drain adjacent to Locks Road.	Natural Resources Wales
	Flood Zones, Aquifers and Source Protection Zones	The Cardiff Bay Barrage - as well as access via Penarth Marina – is within flood zone C2. Access on the Cardiff side of the Barrage is within flood zone B. No information on aquifers or source protection zones is available at present.	Natural Resources Wales
Other Constraints	Under the Barrage Act, shipping movements have priority; Cardiff Council have identified that an Environmental Impacts Assessment would be required.		Desktop study. WelTAG Stages One and Two public/stakeholder workshops.

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange

Option 3: Cogan Interchange			**Source**
Air Quality	Air Quality Management Areas (AQMAs)	There are no AQMAs adjacent to any proposed improvements (a previous AQMA along Windsor Road has now been lifted)	Cogan Railway Station Masterplan for Development and Regeneration Opportunities (WSP/Transport for Wales)
	Sensitive Receptors within the area	• Residential apartments within 30m of the site along Andrew Road; • Commercial businesses including Penarth Leisure Centre, Oystercatcher Restaurant and Tesco Supermarket within 10om of the site; and • Residential properties on Old Barry Road.	Cogan Railway Station Masterplan for Development and Regeneration Opportunities (WSP/Transport for Wales)
Cultural Heritage	World Heritage Sites	There are no World Heritage Sites within 1km of the proposal.	CADW
	Scheduled Monuments	Within 1km of proposed interchange: • Ely Tidal Harbour Coal Slaithe Number One.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Listed Buildings	Within vicinity of proposed Cogan Interchange: • Cogan Station Footbridge; and • Baron's Court Public House.	CADW
	Historic Parks, Gardens and Quiet Areas	There are no historic parks or gardens within the vicinity of the proposed Cogan Interchange site. An initial ecological overview has highlighted the potential for bats, dormice, reptiles and badgers along the railway corridor.	Initial ecological overview
	Conservation Areas	The proposed Cogan Interchange is not currently within any conservation area.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
Landscape	National Parks	The proposal is not within the vicinity of any national park.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Areas of Outstanding Natural Beauty (AONB's)	The proposal is not within the vicinity of any AONB.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Visual Receptors	Visual receptors include residential properties surrounding Cogan interchange.	Cogan Railway Station: Masterplan for Development and Regeneration Opportunities (WSP/TfW)
	Topography	There are many topographical constraints within this site, notably the difference in levels between the Cogan Station car park and A4160 Cogan Hill roundabout junction. The area immediately west of the northbound platform is a steep incline supported by a wall feature.	Desktop study. WelTAG Stages 1 and 2 stakeholder/public workshops.
Nature Conservation	European Designated Sites	The proposed Cogan Interchange location is not within a European Designated Site.	European Environment Agency
	Sites of Special Scientific Interest	The proposed Cogan Interchange is not within an area designated as a SSSI.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	National/Local Nature Reserves	The proposed Cogan Interchange is not within an area designated as a local or national nature reserve.	Lle Geo-Portal (Welsh Government/Natural Resources Wales)
	Sites of Importance for Nature Conservation	Not available at present. SINC information should be obtained through the local biological records centre and consultation with the Cardiff Council ecology department.	Initial ecological overview

	Potential Habitat constraints/opportunities	The Railway Corridor between Cogan and Eastbrook (via Cogan Tunnel) is highlighted as an area that may require further study, due to the possibility of bats, dormice, reptiles and badgers which may be impacted by an increase in service frequency. The initial ecological review has recommended that a Desktop Study, Preliminary Ecological Assessment and, if applicable, a Habitats Regulation Assessment in accordance with the Conservation of Habitats and Species Regulations 2017 for any of the progressed options.	Initial ecological overview
Geology and Soils	Geological Designations	No information at present.	N/A
	SSSI's designated for geological attributes	No information at present.	N/A
Noise and Vibration	Sensitive Receptors	• Residential dwellings within 30m of the site along Andrew Road; • Commercial Businesses including Penarth Leisure Centre, Oystercatcher Restaurant and Tesco Supermarket within 100m of the site.	Cogan Railway Station Masterplan for Development and Regeneration Opportunities (WSP/Transport for Wales)
	Community and Private Assets	The land surrounding the site comprises predominantly residential dwellings and commercial properties. Adjacent land uses/owners include: • Travis Perkins • Network Rail	Cogan Railway Station Masterplan for Development and Regeneration Opportunities (WSP/Transport for Wales)
Road Drainage and the Environment	Watercourses and Waterbodies	Watercourses/waterbodies are identified within the vicinity of Cogan Station. Further detailed analysis of the potential constraints posed by these would need to be considered at later stages of the study for any options progressed to the detailed design stage.	Natural Resources Wales
	Flood Zones, Aquifers and Source Protection Zones	The majority of the proposed Cogan Interchange site is located outside of a flood zone area, however, the area immediately to the east of the current car park (including vehicle access/egress) is located within Flood Zone B. No information on aquifers or source protection zones is available at present.	Natural Resources Wales
Other Constraints	Dense nature of the urban environment and the busy highway network in the vicinity of the site would need to be considered and the impact of construction on local communities.		N/A

Appendix 17 Penarth Cardiff Barrage Sustainable Transport Corridor - Stage Two Consultation Report - Draft

CAPITA

Penarth Cardiff Barrage Sustainable Transport Corridor

Stage 2 Consultation Report - Draft

September 2019

We | Listen Create Deliver

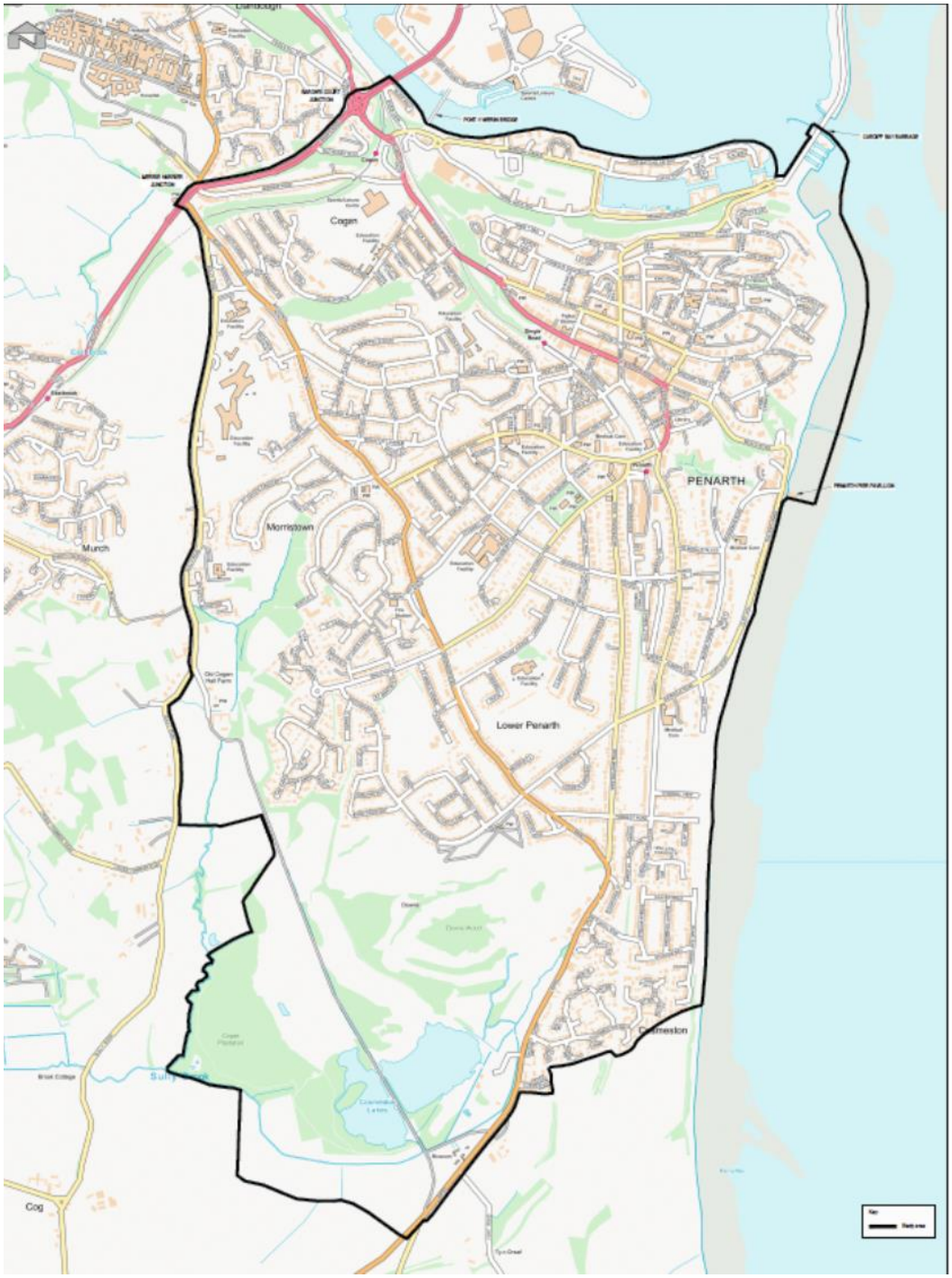
Contents

Appendices

1. Introduction

Capita was commissioned by Vale of Glamorgan Council to undertake a WelTAG Stage Two: Outline Business Case for the Penarth Cardiff Barrage Sustainable Transport Corridor, to develop and appraise shortlisted options that were recommended during the WelTAG Stage One process. These options look to improve sustainable transport within and between Penarth and Cardiff Barrage. The study area can be seen in Figure 1.1.

Figure 1.1 Study Area Map



Two engagement events relating to the WelTAG Stage Two study were held during May and June 2019. Details as follows:

- **Stakeholder Workshop: 22nd May, 14:00 – 16:00, Penarth Pier Pavilion**
- **Public Consultation Event: 19th June 13:00 – 19:00, Paget Rooms, Penarth**

A six-week public consultation period also run between Wednesday 19th June and Sunday 4th August.

The aim of the engagement events was to gain opinion on the shortlisted options in terms of advantages and disadvantages, any constraints or dependencies or risks to implementation. Both events also allowed for general feedback to be gained on the WelTAG study being undertaken.

Both consultation events were arranged and staffed by Capita and Arcadis Consulting UK (representing the Vale of Glamorgan Council).

Shortlisted options investigated in further detail as part of the WelTAG Stage Two study were:

- **Option 1**: Active Travel proposals for Penarth Cardiff Barrage Corridor
- **Option 2**: Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage
- **Option 3**: Cogan Multi-Modal Sustainable Transport Interchange

2. Stakeholder Workshop

2.1 Attendees

On 22nd May 2019, a Stakeholder Workshop event was held at Penarth Pier Pavilion, Penarth. The event was attended by 19 stakeholders. Attendees included representatives from local government, transport operators, public services bodies and the local harbour authority.

A full list of stakeholders invited to the workshop and who attended can be seen in Table 2.1. Attendees labelled 'green' attended the workshop, whilst those labelled 'red' did not attend.

Table 2.1 Full list of Stakeholder Workshop Attendees

Attendee	Representing	Attendance
Clare Cameron	Cardiff Capital Region City Deal	
Robert Cleaver	Transport for Wales	
Mike Cuddy	Penarth Town Council	
John Dent	Vale of Glamorgan Council	
Andrew Eccleshare	Vale of Glamorgan Council	
Michael Garland	Sully Town Council	
John Gibson	Cardiff Council	
Tim John	Sustrans	
Peter King	Cornerswell Ward, Penarth	
Amy Nichols	Transport for Wales	
Cheryl Owen	Cardiff Council	
Bob Penrose	Sully Ward, Sully	
Anne Phillips	Public Health Wales	
Kyle Phillips	Vale of Glamorgan Council	
Emma Reed	Vale of Glamorgan Council	
Chris Seddon	Cardiff Harbour Authority	
Sivaruby Sivagnanam	St Augustine's Ward, Penarth	
Gareth Stephens	Cardiff Bus	
Adam Thomas	New Adventure Travel	
Alison Thomas	Welsh Government	
Neil Thomas	St Augustine's Ward, Penarth	
Stephen Watkins	New Adventure Travel	
Cheryl Williams	Public Health Wales	
Mark Wilson	Stanwell Ward, Penarth	
Chloe Brady	New Adventure Travel	
Cllr Ben Gray	Plymouth Ward, Penarth	

At the start of the workshop, attendees were given a short presentation which included an introduction to the WelTAG process and the Well-being of Future Generations (Wales) Act 2015. The presentation also gave some background on the WelTAG Stage One study for the Penarth Cardiff Barrage Sustainable Transport Corridor as well as highlighting the key problems, opportunities, constraints and study objectives. A brief description of each of the shortlisted Stage Two options was then given before the workshop tasks commenced.

Attendees were split into five groups in order to complete the workshop tasks.

2.2 Tasks Outline

Attendees were asked to identify any key advantages and/or disadvantages for each of the shortlisted options. Whilst identifying these advantages / disadvantages the attendees were also asked to consider any risks, constraints or dependencies.

2.2.1 *Option 1: Active Travel INM proposals for the Penarth Cardiff Barrage Corridor*

Task 1 required attendees to look at Option 1: Active Travel. This option involves the Active Travel proposals within the Vale of Glamorgan's Integrated Network Map that have the most benefit to the Penarth Cardiff Barrage corridor. Table 2.2 shows the advantages and disadvantages recorded during this task as well as opportunities and constraints of Option 1 identified by attendees.

Table 2.2 Advantages/Disadvantages, Opportunities & Constraints of Option 1: Active Travel

Advantages	Disadvantages
• Modal shift for school run / shopping; • Health & Wellbeing; • More pleasant place to live and visit; • Reduction in air pollution; • Increase in physical activity levels; • Introduce electric bike hire to Penarth. This will help tackle gradients and increase journey distances; • Improves access to shops for Penarth residents; • Public mood on board with environmental issues e.g. cutting down emissions; • Explore 20mph more widely = general move towards estate roads – Llandough – feeling estate roads are safer; • Makes big difference, feels safer – WG Consultation; • Barrage being cycle/walk only amazing currently (could be put off by big vehicles); • People cycling more generally; • Potential for bike hire scheme to increase use – electric bikes as potential – would be great; • Speed reduction would be helpful to improve routes if lack of space; • Importance of integrating with options; • PHL good for access to Esplanade – opens up seafront; • Opportunity to protect part of the cliff (via PHL); • Economic benefit – tourism, access to town centre; • Linking to local facilities; • Possible link to Cosmeston and proposed housing development/new school (outside boundary of Penarth); • Opportunity to ensure cyclists are appropriately provided for at stations (e.g. cycle parking); • Cycling promoted along busier roads and chance to promote network; • Chance to repurpose Penarth Station's offering to encourage cycling/walking to that in conjunction with Option 3; • Cars off the road; • Link Cardiff/Vale – open up economic benefits (land opportunities); • Visitors to Penarth from Cardiff (Town Centre, Pier, Cosmeston); • It doesn't exclude other initiatives; • Pods; • Opens up the possibility of Artificial Intelligence (AI) data collection which can inform future decisions; • Potential for solar power as part of this scheme	• Doesn't show connection to Cogan; • Issue with topography i.e. elevation RE: Encouraging cycling; • PHL Scheme = cost effective? Waste of money? • Issues of feasibility & cost of PHL; • PHL may have negative impact on Town Centre; • Cycle lanes on roads scary to use with traffic; • Paget Rd Junction, altered to one-way system, cycle changes made it more difficult for buses; • Contraflow – cars not aware of cyclists = conflict; • 20mph main thoroughfares 30mph congestion issues; • Narrow, lack of space for segregation; • Timescales for delivery a risk; • Impact of on-road parking on feasibility/delivery of schemes; • Potential land use conflict with proposed public transport route (purple link on map); • Topography (particularly Esplanade to Town and Headland to town); • Heavy Bus movements in and around Town Centre; • Cliff Hill/Esplanade requirement for contra-flow. • Cost (VFM); • Can't be used 365 days per year; • Encouraging modal shift is difficult; and • Deliverability of AT Routes.

Opportunities	Constraints
• Improve links to stations and bike parking facilities; • Next-Bikes or similar (via e-Bikes) to encourage more Active Travel; • Other options – at Barry Station); • Opportunity for secure bike parks at Station; • Link potential to Dingle Road from Windsor Road; • Over Pont-y-Werin to Zig Zag Hill – has to be as easy as possible; • Dog-leg Plymouth Road onto Cliff Walk not on desire line (would travel via Raisdale Road); • Needs to be hierarchy of priorities, pointless doing the small network = should focus efforts; • Opportunity to encourage Cosmeston and Lower Penarth; • Need to consider wider area, e.g. Sully; • Route line suggested between Royal Close (top of Zig Zag path) and Cogan Tesco; and • New route suggested on Redlands Road (Merrie Harrier to Cornerswell Road).	• 577 houses south of Cosmeston (adjacent to Cosmeston Lakes entrance); • Headland Link (other links dependent upon implementation of it); • Needs to be sympathetic to bus movements; and • Active travel from most southernly/westerly parts of map unattractive for journeys into Cardiff, but may be attractive if area around Penarth station is repurposed.

2.2.2 Option 2: Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

This option involves a bus park and ride located at Cosmeston Lakes Country Park and a bus priority route to and over Cardiff Barrage. Table 2.3 shows the advantages and disadvantages recorded during this task as well as opportunities and constraints of Option 2 identified by attendees.

Table 2.3 Advantages/Disadvantages, Opportunities & Constraints of Option 2: Bus Priority and Park and Ride

Advantages	Disadvantages

• Need to consider option elements together e.g. cycling elements built in;
• Potential to provide drop off/pick up in Penarth & Barrage;
• Plans for a huge amount of development in Cosmeston – timing;
• Need for active travel links to the P&R;
• Links to Cosmeston from Penarth by public transport;
• Should stop at the station;
  ○ Train interchange opportunities
  ○ Need to coordinate timetables
  ○ Opportunities for P&R
• Commuting water bus instead of on-road options;
• Potential for interchange at the Penarth end of barrage. Greater frequency of existing bus services – journey by bus takes too long for alternative by car;
• Developments outside Penarth (e.g. Sully) – commuters could be captured at Cosmeston;
• Speedier journey via Barrage than Cogan;
• Makes trips Penarth – Cardiff Bay more attractive via public transport;
• Reduce cars on the road;
  ○ Commuter route Monday – Friday
  ○ Improve bus time reliability
• Reduce pollution;
• Electric vehicle charging;
• New developments access to bus routes;
• Allowing more road space at key junction;
• Opens up access to employment leisure;
• More accommodation for elderly users;
• Potential for electric buses; and
• Opportunities for carshare.
	• Logistics of operating the barrage - Window of opportunity for buses is limited;
	• Cost of infrastructure change?
	• Risk of injury to learner cyclists;
	• Justification in demand terms;
	• Does it achieve the journey time savings?
	• Will it achieve modal shift?
	• In traffic route;
	• Who will use the P&R? Who will do the journey? More appealing to have a more frequent service to Cardiff;
	• P&R would discourage potential development at Cosmeston;
	• Hate idea of P&R at Cosmeston – damaging to country park, pollution, more traffic etc;
	• Potential for water bus – seen as a disadvantage to active travel on the barrage – people live it – like the idea of keeping as it is;
	• Lead to more congestion in the area – huge development planned;
	• Alternative option sully moors – not good location;
	• Disadvantage for access if can't walk/cycle over barrage;
	• Won't be able to implement Cosmeston, put P&R where stations go;
	• Barrage bus service – impact on active travel use on Barrage, public health impact of reducing this;
	• Impact of barrage operation on bus access
	• Location (P&R) – there because space for car park not a destination;
	• Would likely need to be funded;
	• Lack of catchment;
	• P&R difficult to see financial model; and
	• Would require re-model of Victoria Rd/Stanwell Rd junction due to crossing.

Opportunities	**Constraints**
• Need to consider option elements together e.g. cycling elements built in; • Opportunity for more frequent shuttle bus services within Penarth linking to key destinations and different types of services e.g. shuttle bus, circular route between medical centre, stations etc; • Focus on speeding up current services with route across barrage; • Look at locations e.g. A48; • Strong commuter element via bus; and • More existing bus bays to more convenient locations for operators (time savings).	• Deliverability, space; • Demand for P&R at the given location; • P&R at Dinas would be better; • Who are the users? • Deliverability/restrictions via barrage; • Provision for parking at Cosmeston; • Blot on the landscape; and • Other considerations before opening.

2.2.3 Option 3: Cogan Multi-Modal Sustainable Transport Interchange

This option consists of improvements to Cogan Station to create a multi-modal interchange facility. Table 2.4 shows the advantages and disadvantages recorded during this task as well as opportunities and constraints of Option 3 identified by attendees.

Table 2.4 Advantages/Disadvantages, Opportunities & Constraints of Option 3: Cogan Interchange

Advantages	Disadvantages
• Access for all critical – can't get from one side to another if mobility problems; • 10% of spaces need to have electric vehicle charging (implication of space required for these spaces) • Understanding that planning approval could be overwritten by WG buying the land (what is it in the LDP? Windfall? Buying as part of this development?); • Possibility to provide additional platforms for branch line; • Scope to reopen tunnel to Ferry Road; • Enhancement of access (Cogan); • Able to focus 'identity' of stations, e.g. Penarth Active Travel; • Could act as Bus Gate to avoid Cogan Hill queuing if Bus Only; • Need more spaces; • Access under road – light rail; • Make train more attractive; • EV Charging; and • Next Bike routes.	• Number of spaces; and • Operational on exit? • Never had a problem for parking at Cogan, but issues getting on the train; • Would increase pollution – worse. Cogan air quality and would encourage more cars in the area; • Cycle parking not shown on plan – need to put in really good facilities; • Cycle route along Windsor Road – need to go through Leisure Centre; • Very different option – doesn't target the same area as the other 2 options; and • Issues of congestion around station – why would people make journey along Windsor Rd? • Emphasis on car. Cycle parking provision needs to be provided for; • Impact on air quality – already poor; • Will parking just be for the station? Possibility will attract overspill parking = more car trips; and • Too heavily car orientated – needs more emphasis on active travel and facilities and connectivity for above travel to the local area. • Danger of being used as rat run to avoid Cogan Hill queues; • Is this the best location to be soaking people onto the train?; • Makes junction onto Cogan Hill/Terra Nova Way very unattractive for all users; • Does not solve pinch point on bridge; • Any work on Cogan Hill/Station causes wider traffic issues; • Anecdotal evidence of drivers turning left from Cogan Spur and using roundabout to avoid Cogan Spur queue (Dinas Arm also causing issues); and • Wouldn't be attractive for Cardiff to Penarth buses to call in, due to having to re-circulate roundabout and effect on journey times. • Enough capacity on existing trains; • Congestion and turning from rail and Wellbeing hub parking; and • Too many disabled spaces.
Opportunities	**Constraints**
• May be an extended car park at the leisure centre; • Add in 100+ bike spaces; • Potential for bike rental at the station; • Where travelling to? Need to consider cyclist priority; • Mention of potential use of tunnel (half filled); • Need to make cycling as easy as possible; • Volumes of traffic on Lavernock Rd; • Need a package of measures e.g. employment premises; • 2 lines on map to denote an area in front on station should be bus priority; • Re-establishment of Penarth Spur station; • Improve priority at egress of Cogan Station; • Must be done in context of Metro; • Could we incorporate replacement of road bridge with the pedestrian bridge (x1 road/pedestrian bridge); • Could land at the Wellbeing Hub be incorporated? And; • Unclear about land usage (could it be overturned via CPO?).	• Can we achieve modal shift? • Needs to integrate with INM for cycling; • Need to be able to get across Windsor Road (can only cross Windsor Road when totally congested); • Need to ensure bus services serve site; • Need to consider routes to the station. How we get people to the station is an issue; • Cogan Hill roundabout; and • No big housing development to pick up additional demand – target areas with new developments. • Believe that ticket office would be unviable for number of spaces/users; and • Area cordoned off for development may be red herring; • Not aspirational enough; • Uncertainty sustainable housing; and • Little parking at present.

2.3 General Discussion and Feedback

After completion of the workshop tasks, there was a chance for attendees to give any feedback or have a discussion on the study as a whole. Table 2.5 below shows the comments that were captured during this discussion.

Table 2.5 General Discussion and Feedback

General Discussion and Feedback
• Focus on different modes coming together; • Give the public specific information on what exactly is being done on each active travel INM route (drop kerbs, signage etc.); • Take into account rail; • Consider Electric Vehicles – charging; • Problem is outside the study area – sully development (Need to consider areas outside study area); • Attracting more cars to Cogan is not good; • Questions over the number of active travel journeys to work; • Mix of modes required; • Do need to sort out congestion; • Emphasis on getting people out of their cars e.g. massive expansion of Nextbike scheme etc; • Unrealistic that huge numbers will cycle to work; • Been a huge expansion as made easier e.g. employers providing facilities (PHW offices), Next bike etc; • Not everyone can, not everyone wants to cycle; • Weather – can effective active travel levels; • Mix of modes needed – not just about cycling; • Infrastructure to encourage electric vehicle etc; • Need to focus on different modes coming together – integrate modes, options – easy to interchange – use different modes; • Public will want to know local impact – what does it mean for me, specifics of proposals; • Lots of WelTAG studies ongoing – need to have to be taken into account; • EV buses – local authorities successful in getting funding, need to build into proposals – also charging for vehicles/bikes etc; • Problem is outside the area e.g. housing developments in wider area – should look at those areas to understand travel patterns, where people will want to go; • Sully moors potential – shuttle buses, P&R etc. – not dealing with wider area; • Not intended to pick up Barry housing areas – closer stations; • Train capacity will increase over time; • Additional parking – already most polluted area in Cogan. • Public realm enhancements on the approach to the Penarth Railway Station. Move the station under the bridge and use the 'new' space left over to enhance the public realm and sustainable transport provision to this destination/facility. • Cycle parking • Link to bus 'circular' Penarth route linking the station with other key land uses throughout Penarth (i.e. schools, health hubs, retails & residential areas). • Feel gateway to Penarth is required with emphasis on active travel.

3. Public Consultation

3.1 Public Consultation Event

On 19th June 2019, a Public Consultation Event was held at the Paget Rooms, Penarth. This event was open to the public from 13:00pm until 19:00pm. 100 members of the public attended the event between these times. Table 3.1 provides a breakdown of attendees recorded by hour.

Table 3.1 Number of Attendees at the Public Consultation Event (by hour)

Time	No. of Attendees
13:00 – 14:00	17
14:00 – 15:00	12
15:00 – 16:00	13
16:00 – 17:00	10
17:00 – 18:00	22
18:00 – 19:00	26
Total (13:00 – 19:00)	**100**

Attendees at the Public Consultation Event were able to view 20 bi-lingual displays boards that outlined;

- Background & Study Context;
- WelTAG process;
- Key Problems within the study area;
- Study Objectives;
- Well-being Objectives; and
- Three Shortlisted Options.

A copy of the display board information is included as Appendix A.

During the event Capita staff and Council Officers (including an Arcadis member of staff representing Vale of Glamorgan Council) were present to discuss any questions attendees had about the information displayed or the shortlisted options.

A Welsh speaking Council Officer was present throughout the consultation event and display board information was provided in large print hard copy following the event at the request of a partially sighted attendee.

A questionnaire was available for completion by attendees during this event (see appendix A for a copy of the questionnaire). The responses received from the Public Consultation event were added to those received during the 6-week consultation period (see Chapter 4).

3.2 Public Consultation Questionnaire (6 Week Consultation)

For the six-week public consultation period (19th June – 4th August), a short questionnaire was available for completion to gain the public's thoughts and opinions on each of the shortlisted options. The questionnaire asked members of the public to rate each option and state which they would like to see implemented. Respondents were also asked to outline the aspects of each options that they particularly liked or did not like, and were given the opportunity to provide any additional comments about the options or the study as a whole

The public consultation was advertised by the Vale of Glamorgan Council via their website and social media channels.

The questionnaire was available to complete on the Vale of Glamorgan Council website.

A copy of the questionnaire is shown in Appendix B.

4. Public Consultation Questionnaire Results

Below is a summary of the results from the public consultation questionnaire, including the paper copies completed at the consultation event and the questionnaires received via the online submission. A full set of responses and results from the public questionnaire can be viewed in Appendix C.

A total of 47 paper surveys were completed at the consultation event with a further 248 surveys completed online during the 6-week consultation period. In total, 295 survey responses were received.

N.B. Not every respondent answered every question fully. Answers are therefore provided as a percentage of the responses to each question.

4.1 Overall opinion on Short Listed Options

Question 1 asked 'Please can you give us your opinion on each option? Please tick one rating for each option'.

Table 4.1 and Figure 4.1 display the results from Question 1. It can be seen that over 70% of questionnaire respondents like the Active Travel option by selecting 'strongly agree' or 'agree'. Option 2 is less favoured with over 50% of respondents selecting 'strongly disagree' or 'disagree' in response to whether they would like to see the Cosmeston Park and Ride and Bus Priority Link across Cardiff Barrage.

Opinion seems to be split on the Cogan Interchange option as over 40% of respondents 'strongly agree' or 'agree' with this option, whilst over 25% either 'disagree' or 'strongly disagree' with it.

Table 4.1 Please can you give us your opinion on each option?

I would like to see	Option	Strongly Agree (%)	Agree (%)	Neither Agree nor Disagree (%)	Disagree (%)	Strongly Disagree (%)
	1. A/T	56	21	8	4	11
	2. Bus	19	13	12	14	42
	3. Cogan	19	30	23	15	13

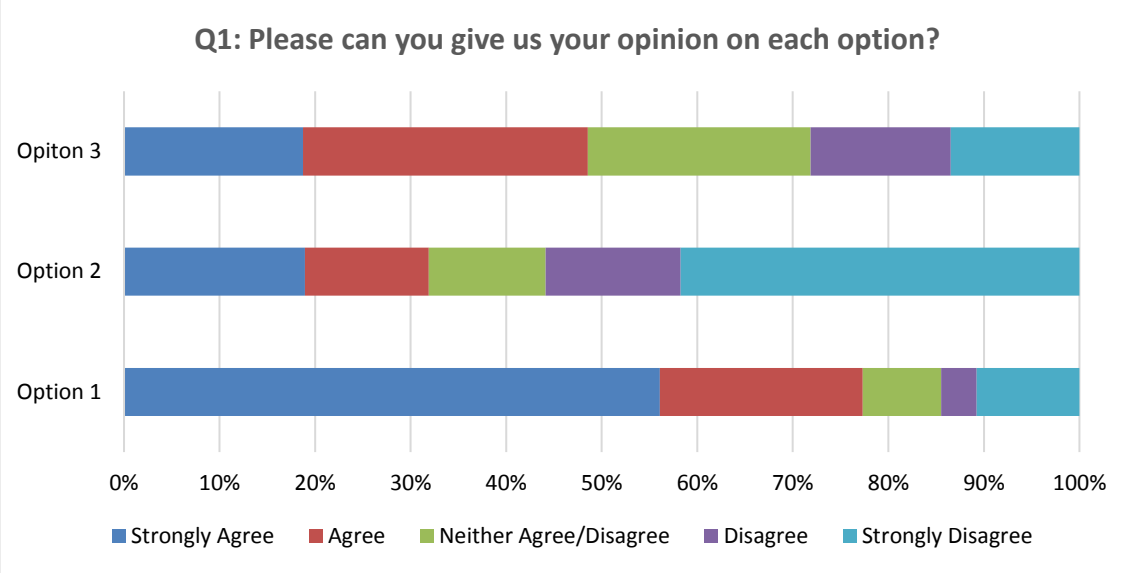


Figure 4.1 Please can you give us your opinion on each option?

4.2 Aspects of the Short-Listed Options that respondents liked or disliked

Question Two asked, 'Are there any aspects of the proposed options that you particularly like or dislike?'

Option 1 - Active Travel

The most common aspects of Option 1 (Active Travel) liked or disliked by members of the public are displayed in Table 4.2. It can be seen that the Penarth Headland Link (PHL) proposal is a commonly liked aspect of this option with 17% of responses making reference to the PHL as an aspect of the option that they liked.

However, 5% of responses did express concerns over the PHL route, with cost and environmental impacts being reasons behind their concerns. In addition, 7% of responses received stated that the Active Travel proposals are not ambitious enough.

Table 4.2 Common aspects of Option 1 (Active Travel) respondents liked / disliked

Comment / Aspect in Favour	**% of Responses**
Penarth Headland Link (Link K)	17
General Positivity	12
Will encourage a modal shift	8
Extension of Cycle routes across town and walking routes	4
We need more safe walking / cycling routes in Penarth	4
Can also attract people into Penarth and vice-versa Cardiff Bay and Cardiff	3
Comment / Aspect Against	**% of Responses**
Not ambitious / wide enough / enough priority given to cyclists & pedestrians	7
Cycle lanes – waste of money / dangerous / not enough	6
Penarth Headland Link (Link K)	5

Should include Sully in the proposals	3
General Negativity	2

Option 2 - Cosmeston Park and Ride, Bus Priority and Link Over Barrage

The most common aspects of **Option 2** liked or disliked by members of the public are displayed in Table 4.3 below. The public expressed concerns regarding this option. For example, in relation to the barrage being used by buses in regard to the safety of the walking and cycling environment (20% of responses) and in regard to buses being on the barrage generally (13% of responses).

Table 4.3 Common aspects of Option 2 (Cosmeston Park and Ride) respondents liked / disliked

Comment / Aspect in Favour	**% of Responses**
Nothing in Favour	9
General Positivity	6
Only positive if electric bus / zero pollution modes are used	2
Could get people out of their car / reduce car use	2
Park & Ride	2
Encourages modal shift	2
Comment / Aspect Against	**% of Responses**
Concern over safe walking / cycling environment on the barrage being lost if motor vehicles allowed	20
Should not allow buses on the barrage	13
Wrong location for P&R site - Not sure if Penarth traffic will be captured / increase Lavernock Rd traffic	6
Environmental degradation / community impacts at Park & Ride site	4
Buses will be unreliable (effect of barrage)	2

Option 3 – (Cogan Interchange)

The most common aspects of **Option 3** liked or disliked by members of the public are displayed in Table 4.4 below. Public opinions on the Cogan interchange option seem split with 10% of respondents expressing general positive views about it and 6% of respondents highlighting the active travel improvements. However, 15% of respondents stated that the proposal was not ambitious enough and didn't address the traffic issues in Penarth, with 10% of respondents stating general negativity about the proposal.

Table 4.4 Common aspects of Option 3 (Cogan Interchange) respondents liked / disliked

Comment / Aspect in Favour	**% of Responses**
General Positivity	10
Active Travel improvements	6
Sorts outs station / improvements	4
Cycle Parking	3
Increase accessibility	2
Additional Parking	2

Comment / Aspect Against	% of Responses
Not ambitious / too narrow an option / doesn't address traffic issue in Penarth (wrong location) / will increase traffic through Penarth	15
General Negativity / waste of money	10
Need link to Penarth Line (new station, bridge, new line)	3
Problems with trains (full, overcrowded, reliant)	3
Will encourage more congestion	6

4.3 Views on the success of Options in Achieving Objectives

The third question of the questionnaire asked respondents to rate to what degree they felt each option would be successful in meeting the study objectives. The ratings were based on the following scoring scale:

1. 'Not at All';
2. 'A Small Degree';
3. 'A moderate Degree';
4. 'A Large Degree'; and
5. 'A Very Large Degree'

Based on this scale, the scores for each option against each objective are shown in Table 4.5.

Table 4.5 Scoring of Options against Objectives

Objective	Option 1 Scoring (%)					Option 2 Scoring (%)					Option 3 Scoring (%)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1. Reduce reliance upon the private car & encourage more sustainable modes	14	23	24	20	19	35	31	16	11	7	22	30	28	13	7
2. Reduce barriers that constrain opportunities to use sustainable modes of transport	16	19	22	20	23	36	30	17	11	6	22	29	25	17	7
3. Increase sustainable transport options to improve accessibility along the study corridor	13	20	24	20	23	37	2	15	13	6	28	26	26	12	8
4. Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment	19	17	21	20	23	49	21	14	9	7	35	23	26	11	5
5. Introduce sustainable transport measures that protect and enhance the historic, built and natural environment	19	21	16	21	23	54	16	15	9	6	36	25	23	12	4

Table 4.5 shows that in reaction to each of the objectives, respondent rated Option 1 (Active travel most positively and Option 2 (Cosmeston Bus Park and Ride) most negatively against all objectives.

As with the results of previous questions, the response to Option 3 (Cogan Interchange) appears more mixed.

4.4 Additional Comments

At the end of the questionnaire, respondents where able to add any additional comments they had on any of the shortlisted option or the study as a whole. The full set of additional comments can be seen as part of Appendix B. This section summarises some of the common themes highlighted by these additional comments.

Comments in relation to **Option 1: Active Travel** were generally positive towards the Active Travel proposals. Many highlighted the positive impact the Penarth Headland Link would have on Penarth with increased connectivity to the Barrage which would bring an increase of visitors to Penarth. Comments that supported this include:

"*The Headland Link offers real, positive advantage to Penarth. The opening up of a link between the end of the Barrage and Penarth front can be very positive for improving connectivity by bike, increasing visitors and improving health and well-being."*

However, comments were not completely positive towards the Penarth Headland Link with some people highlighting the cost of the link:

"*Why not undertake the Active Travel Proposals first without Penarth Headland Link (as the cost of this will be large).***"**

Other common themes about Option 1: Active Travel include support of 20mph speed limits, comments about expanding Next Bike hire and the possible introduction of electric bikes and routes to schools. A number of comments were made in relation to the proposals being not ambitious enough. These included negative comments in relation to on-road cycles lanes and that routes need to be off-road and segregated from traffic.

A common theme in relation to **Option 2: Cosmeston Park and Ride and Bus Priority** was the negative views towards the Barrage route not just being for walking and cycling. There is a common concern about the safety of active travel users if a bus route is introduced over the Barrage, and a view that buses should not be allowed across the Barrage.

"Please do not introduce traffic onto the barrage. This would be a total disaster, stop people (especially families) from walking and cycling across it, and force more people into their cars."

Also common were negative views towards the Park and Ride at Cosmeston. These included comments about the location being wrong, the impact on the country park and how it would not affect congestion through Penarth.

In relation to **Option 3: Cogan Interchange**, a common theme from the additional comments was that the interchange at Cogan would encourage more traffic on nearby roads and junctions. For example:

"Altering Cogan station to encourage more cars to park there would be an absolute disaster for the people of Penarth and Dinas as this is the bottle neck area."

However, there were some positive comments about how the Cogan Interchange would improve the accessibility of the station.

"Cogan station could be so much more user friendly and disability friendly."

The additional comments also highlighted some wider issues in and around the study area which the shortlisted options would relate to but not solve or influence completely. These included the introduction of integrated ticketing, which was an intervention that was mostly in favour amongst respondents. The extension of the Penarth Rail Line was also mentioned by a number of people, as was the impact of additional planned housing in surrounding areas such as Sully. There was also a concern over rail capacity and how currently the trains serving the study areas are overcrowded. These comments do link to Option 3: Cogan Interchange.

4.5 Further Responses

In addition to those comments received as part of the questionnaire, additional letters have been received with comments on the shortlisted options in response to the public consultation. These additional letters are shown in full in the following appendices:

Appendix D – Letter from the Penarth Headland Link Group

Appendix E – Our Future Community Letter

Additional comments were provided by Natural Resources Wales (NRW) as part of their questionnaire response. There questionnaire responses have been added to the total number of questionnaires. Their additional comments are shown separately in Appendix F as they are an important stakeholder in the future processes of this study.

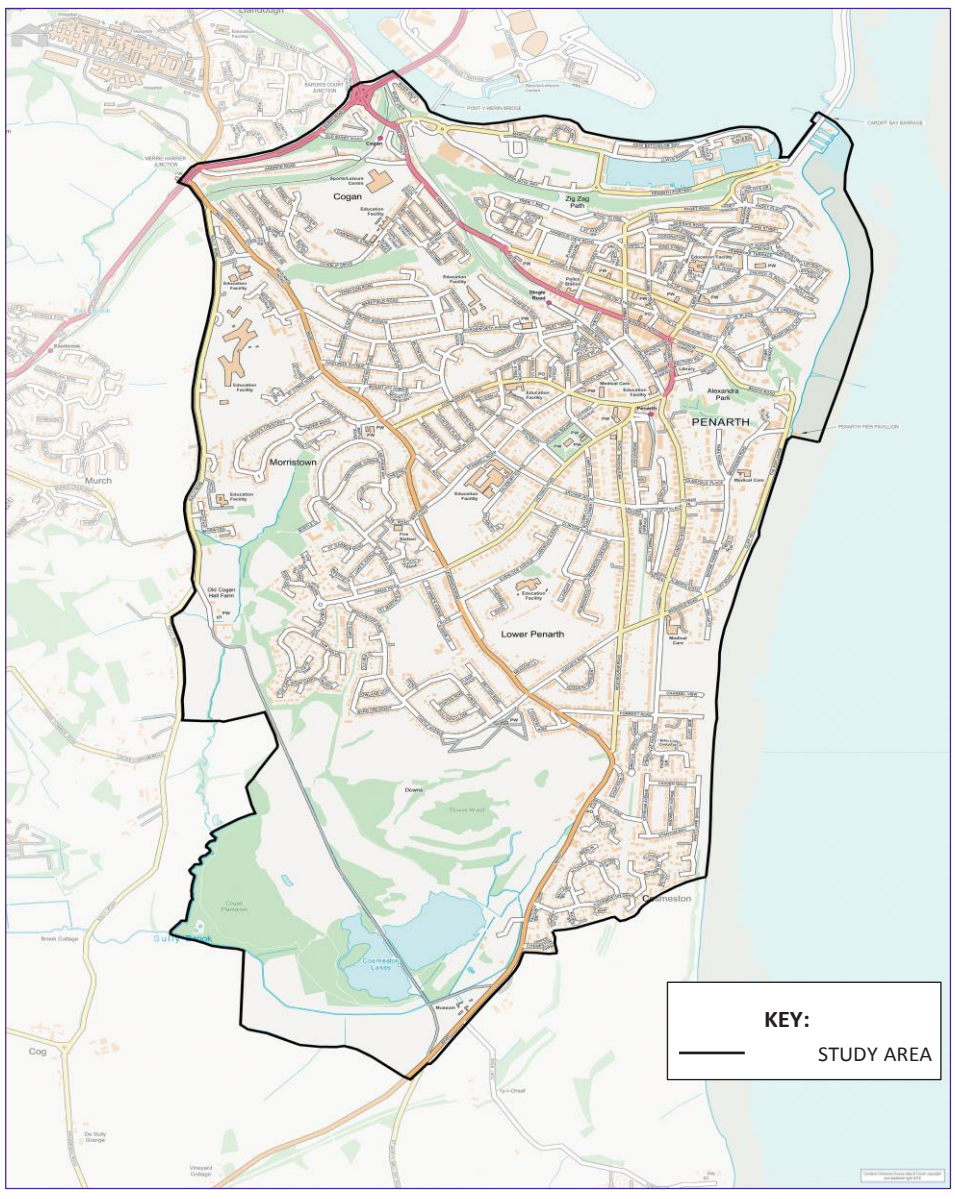
Appendix A – Public Consultation Event Display Boards

Penarth Cardiff Barrage Sustainable Transport Corridor Study

Background and Study Context

The proximity of Penarth to Cardiff presents both challenges and opportunities in terms of connectivity and accessibility. However, the location of the Vale is also a key factor in the area having the highest rate of out-commuting in Wales, the majority of which is commuting into Cardiff.

These high levels of out commuting result in peak time congestion on the main distributor roads in the eastern Vale of Glamorgan, which has a negative impact on existing road-based sustainable transport options for everyday journeys.



In November 2018 the Vale of Glamorgan Council commissioned Capita to undertake a WelTAG Stage One (Strategic Outline Case) and Stage Two (Outline Business Case) assessment to look into options to improve sustainable transport within the Penarth to Cardiff Barrage corridor. The study area is shown in Figure 1.

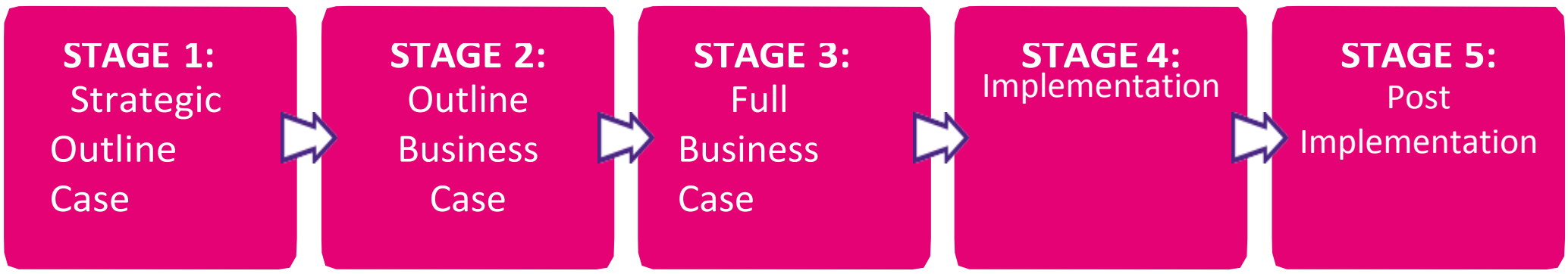
The WelTAG Stage One reported in March 2019, with WelTAG Stage Two currently being undertaken.

What is WelTAG (Welsh Transport Appraisal Guidance)?

WelTAG provides a framework for thinking about proposed changes to the transport system within Wales, with best practice guidance provided for the development, appraisal and evaluation of proposed transport interventions.

WelTAG:

- Is the methodology to be used to appraise transport schemes within Wales;
- Takes account of the Well-being of Future Generations (Wales) Act 2015 and the UK Government's public investment requirements ('5 case model'); and
- Is a five stage process.



WelTAG Stage One: Strategic Outline Case

The Penarth Cardiff Barrage Sustainable Transport Corridor Study WelTAG Stage One was produced in consultation with stakeholders and the public. It defined the key problems within the study area, presented a clear case for change, produced study objectives and identified a long list of possible options.

Study objectives were assessed to ensure they contributed to the well-being goals of the Well-being of Future Generations (Wales) Act 2015 and their fit with well-being objectives defined by relevant public bodies.

Key Problems & Objectives

Key Problems within Study Area

- Existing volumes of traffic and levels of congestion causes pollution and creates unreliable journey times, particularly during peak periods.
- Sustainable transport options available do not present an attractive alternative to car travel.
- A lack of Park and Ride facilities in the area limits the opportunities for interchange between car and public transport, reducing attractiveness of public transport travel options.
- High levels of car use and low levels of public transport usage and active travel, particularly for commuting journeys.
- Bus services linking Penarth and Cardiff have slow journey times and are unreliable due to congestion along the bus corridors.
- There are currently low levels of active travel for everyday journeys, which needs to be increased if the long-term health benefits of active travel are to be realised.
- Environmental factors reduce the attractiveness of walking and cycling.
- Safety issues act as a barrier to walking and cycling.
- A lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes within Penarth and between Penarth and Cardiff creates a poor quality environment for walking and cycling and acts as a barrier to encouraging active travel.
- A lack of facilities for cyclists at trip origin and destination discourages the use of active travel.
- The topography of the area acts as a barrier to active travel and creates difficulties in providing active travel infrastructure.
- Poor connectivity to the wider area reduces the potential to encourage tourism and leisure visitors to Penarth.
- The high volume of traffic acts as a barrier to walking and cycling and to increasing levels of active travel.
- Road traffic emissions and congestion contribute to poor air quality.

Study Objectives

- Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel.
- Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.
- Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being.
- Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment.
- Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.

Shortlisted Options

The WelTAG Stage One looked at a number of possible options to improve sustainable transport within the study area and concluded by recommending three shortlisted options (plus a 'do minimum') for further appraisal at Stage Two.

These were:

- Option 1: Active Travel proposals for the Penarth Cardiff Barrage Corridor;
- Option 2: Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage;
- Option 3: Cogan Multi-Modal Sustainable Transport Interchange; and
- Option 4: Do Minimum.

N.B. An Option 4 'Do Minimum' is taken forward to Stage Two, in line with WelTAGGuidance, as a baseline for appraisal. This option would only see required maintenance of existing infrastructure to keep transport networks operational.

Each of the shortlisted options were appraised in terms of their ability to address identified problems, meet study objectives and their impact in terms of environmental, economic, cultural and social aspects. A summary of the results is shown in Tables 3, 4 and 5.

Well-being of Future Generations (Wales) Act 2015

Central to the appraisal was the Well-being of Future Generations Act (Wales) Act 2015, with the five ways of working embedded within the processes undertaken (see Table 1). Each of the schemes at Stage One were appraised in terms of their impact on the seven well-being goals defined in the act as well as the well-being objectives defined by the relevant public bodies.

Table 1 – Five Ways of Working

Way of Working Defined in Act	How Addressed in Study Process
LONG TERM The importance of balancing short-term needs with the need to safeguard the ability to also meet long-term needs.	Identification of long-term trends using information from the Well-being Assessment produced by the Public Service Board. Assessment of scheme's ability to address long-term trends.
PREVENTION How acting to prevent problems occuring or getting worse may help public bodies meet their objectives.	Each scheme has been assessed in terms of its ability to address identified problems within the study area, so that problems can be prevented or reduced in impact through implementation of an option.
INTEGRATION Considering how the public body's well-being objectives may impact upon each of the well-being goals, on their other objectives, or on the objectives of other public bodies.	Each of the relevant public bodies' well-being objectives have been identified and each scheme assessed in terms of how it addresses the well-being objectives. Study objectives have been formed to integrate with the well-being objectives.
COLLABORATION Acting in collaboration with any other person (or different parts of the body itself) that could help the body to meet its well-being objectives.	Working with stakeholders via Stage One and Stage Two workshops to collaboratively identify study area problems, form scheme objectives and identify and develop options.
INVOLVEMENT The importance of involving people with an interest in achieving the well-being goals, and ensuring that those people reflect the diversity of the area which the body serves.	We have involved the public by holding two public consultation events and a six-week consultation period to try to ensure that we capture the diversity of opinion from people within the study area.

WelTAG Stage Two: Outline Business Case

Further feasibility work and appraisal is currently being undertaken on each of the shortlisted options.

This event marks the beginning of a six-week public consultation period and to ensure the best outcomes from the study, we would be grateful if you could complete a short questionnaire providing your opinions on the options. The questionnaires will subsequently feed into the WelTAG Stage Two appraisal of the shortlisted options.

If you would like more time to consider the proposals, or you know of people who were unable to attend today that might be interested in giving their opinion, the consultation will be open until **Wednesday 31st July 2019** with all presentation material and an online version of the questionnaire available at:

www.valeofglamorgan.gov.uk/en/living/Roads/Transport-Studies/Transport-Studies.aspx

Option 1:
Active Travel Proposals for the Penarth Cardiff Barrage Corridor

This option involves the implementation of the Active Travel proposals within the Vale of Glamorgan's Integrated Network Map (INM) that have the most benefit to the Penarth Cardiff Barrage corridor. This includes implementation of the Penarth Headland Link - a proposed 1km rock-fill causeway between Penarth Esplanade and Cardiff Barrage to provide a shared-use pedestrian and cycle route.

The proposed links are shown in Figure 2 and a summary of potential improvements by link can be seen in Table 2.

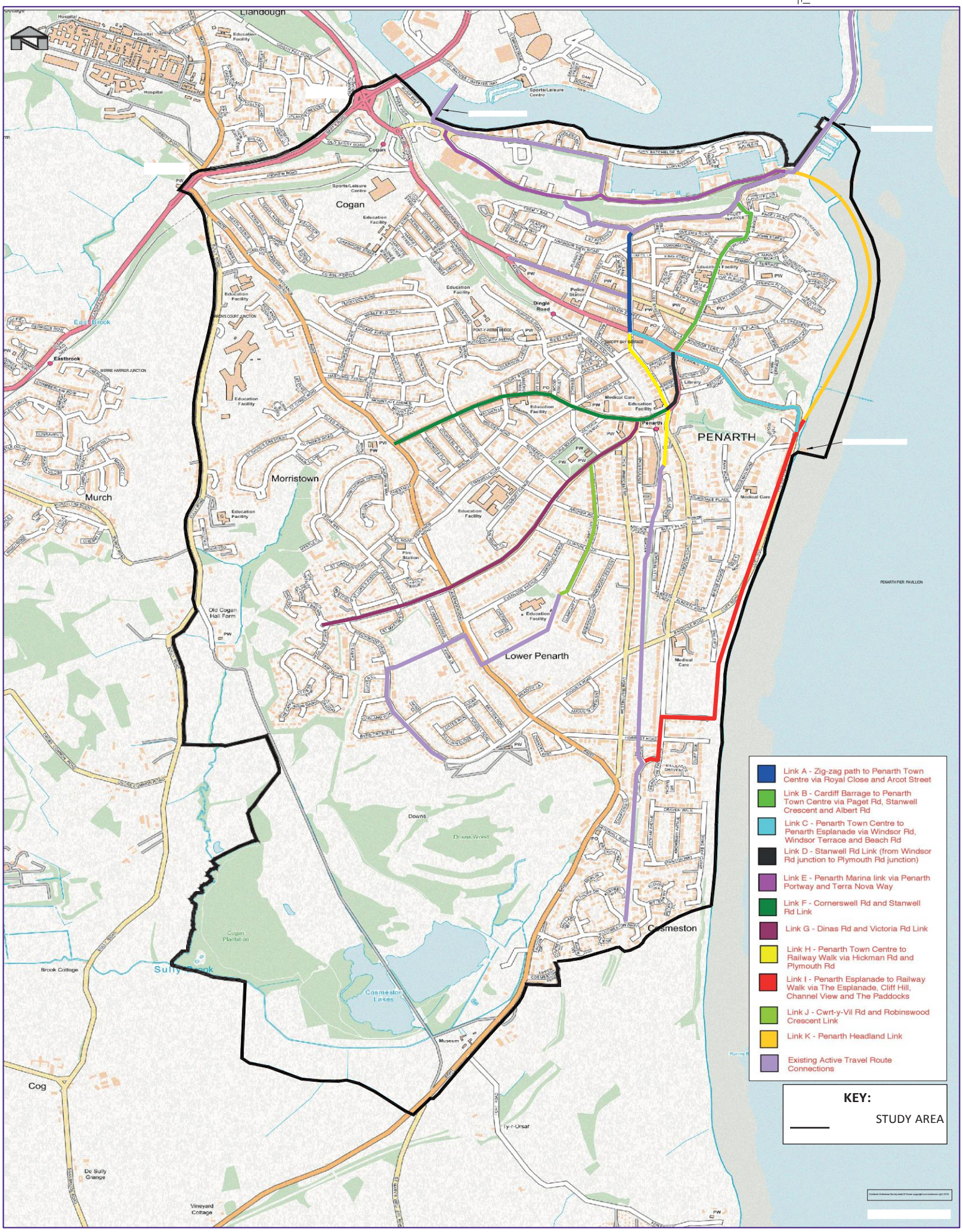


Figure 2 – INM Active Travel Proposals for the Penarth Cardiff Barrage Corridor

Active Travel Proposals for the Penarth Cardiff Barrage Corridor (Option 1)

Table 2 – Potential Improvements

LINK	POTENTIAL IMPROVEMENTS
ALL LINKS	20 MPH speed limit to be considered Need for additional cycle parking to be considered
LINK A LINK A Zig-Zag path to Penarth Town Centre via Royal Close and Arcot Street	• On line highway markings at more regular intervals • Improved route signage particularly towards town centre • Provision of more cycle parking • Introduction of parking restrictions at junctions to improve visibility • Improvements to Arcot Road/Windsor Road/Hickman Road junction/crossing point (e.g. narrowing/building out junctions)
LINK B LINK B Cardiff Barrage to Penarth Town Centre via Paget Street, Stanwell Crescent and Albert Road	• On line highway cycle markings at more regular intervals • Route signage • Cycle awareness markings, particularly across/at junctions (e.g. sections of coloured cycle lanes across junction entrances/exits) • Introduction of parking restrictions on junctions to improve visibility • Dropped kerbs at ‘desire line’ crossing points along route

LINK	POTENTIAL IMPROVEMENTS
LINK C LINK C Penarth Town Centre link along Stanwell Road	• On-line highway cycle markings at regular intervals • Route signage • Cycle awareness markings particularly across/ at junctions (e.g. sections of coloured lanes across junction entrances/ exits) • Dropped kerbs at 'desire-line' crossing points along route • Improvement to cycling environment at Windsor Road/ Windsor Terrace roundabout to be considered
LINK D LINK D Penarth Town Centre link along Stanwell Road	• On-line highway cycle markings at more regular intervals • Route signage • Improvement to Stanwell Road/ Hickman Road/ Plymouth Road signalised junction to be considered
LINK E LINK E Penarth Marina Link	• Improved route signage • Consideration of improvement to traffic calming features from a cyclist's perspective
LINK F LINK F Cornerswell Road and Stanwell Road Links	• On-line highway cycle markings at more regular intervals • Route signage • Cycle awareness markings particularly across/ at junctions (e.g. sections of coloured cycle lane across junction entrances/ exits) Improvements to the Cornerswell Road/ Stanwell Road mini-roundabout for pedestrians and cyclists to be considered
Link G LINK G Dinas Road and Victoria Road Link	• On-line highway cycle markings at more regular intervals • Improved route signage • Increase of dropped kerbs as close to 'desire' crossing points as possible • Improvements to access into and route through Station Approach area to be considered

LINK	POTENTIAL IMPROVEMENTS
LINK H LINK H Penarth Town Centre to Railway Walk via Hickman Road and Plymouth Road	• On-line highway cycle markings at more regular intervals • Route signage • Cycle awareness markings particularly across/ at junctions (e.g. sections of coloured cycle lane across junction entrances/ exits) • Improvement to Stanwell Road/ Hickman Road/ Plymouth Road signalised junction to be considered • Changes to highway layout at northern end of Plymouth Road (e.g. removal of central reservation and parking, improvement of public realm) • Access improvements onto Railway Walk
LINK I LINK I Penarth Esplanade to Railway Walk (via Cliff Hill)	• Options for highway/ footway space reallocation to be considered along the Esplanade and Cliff Hill to enable a two-way route for cyclists • Widening of existing off-road route between Cliff Hill and Channel View to provide a shared-use route and improved access point at Channel View • On-line highway cycle markings at regular intervals along Channel View, Plymouth Road, Fforest Road, The Paddocks and Birch Lane • Route signage
LINK J LINK J Cwrt-y-Vil Road and Robinswood Crescent Link	• On-line highway cycle markings at regular intervals • Route signage • Cycle awareness markings particularly across/ at junctions (e.g. sections of coloured cycle lane across junction entrances/ exits) • Introduction of parking restrictions on junctions to improve visibility • Widened link from on-road route onto existing off-road route at southern end of Robinswood Crescent • Dropped kerbs at suitable crossing points
LINK K LINK K Penarth Headland Link	• Construction of a rock-fill causeway between Penarth Esplanade and the western end of the Cardiff Bay Barrage to provide a shared use pedestrian and cycling link

Option 1 Review

Table 3 - Review of Active Travel proposals for the Penarth Cardiff Barrage Corridor

Problems Addressed	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution. • Volume of traffic is a barrier to walking and cycling. • Sustainable transport options not an attractive alternative to car travel. • Unreliable and slow journey times of bus services. • Low levels of Active Travel. • Safety issues act as barrier to walking and cycling. • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes. • Lack of facilities for cyclists at trip origin and destination. • Environmental factors reduce the attractiveness of walking and cycling. • Topography of the area acts as a barrier to walking and cycling. • Road traffic emissions and congestion contribute to reduced air quality. • Poor connectivity to the wider area reduces potential for tourism and leisure visitors.

Objectives Appraisal	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel	+++
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes	+++
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being	+++
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment	++
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment	++

Advantages / Disadvantages	**Advantages** • Would provide a network of Active Travel routes within Penarth and connect to existing high quality routes (e.g. Cardiff Barrage, Pont y Werin, Railway Walk). • Several 'quick-win' interventions could be delivered within a relatively short timescale. • Proposals could improve safety (actual and perceived) for pedestrians and cyclists within the town centre through the introduction of a 20mph limit. • Could lead to health and well-being benefits by encouraging greater levels of walking and cycling. • Larger scale proposals (e.g. Penarth Headland Link) could have wider tourism and leisure benefits. • Majority of proposals are within the highway boundary and have no land requirements.	**Disadvantages** • Difficult to overcome steep topography within Penarth, which could reduce the accessibility of some of the proposed Active Travel routes. • High capital cost associated with the larger scale proposals (e.g. Penarth Headland Link). • Does not include any potentially attractive routes outside of the Vale of Glamorgan's INM at this stage. • Limited space in many areas to implement off-road improvements – a lack of segregation of cyclists from traffic may reduce the attractiveness of routes. • Active travel improvements may have a limited impact on reducing commuting journeys by car.

Constraints / Dependencies	**Constraints** • High level of capital investment needed to deliver all the Active Travel proposals. • Environmental and geotechnical considerations associated with the development and implementation of the Penarth Headland Link. • Constraints of the built environment (e.g. road width, levels of parking) limits the extent of off-road cycling improvements that can be provided. • A number of challenging and constrained junctions along the routes such as the Plymouth Road/ Stanwell Road Junction and Windsor Road/ Windsor Terrace/ Stanwell Road roundabout.	**Dependencies** • Active Travel infrastructure being available at key origin/ destination points will be important to increase usage of the Active Travel routes (e.g. showers and cycle storage at employment sites). A bike hire scheme within Penarth – will require liaison with third parties. • Would require safe and attractive linkages to destinations outside of the study area (e.g. linking into Cardiff Council proposals for Active Travel improvements). • Maintenance and any operational requirements of new infrastructure would need detailed consideration (e.g. those linked to the Penarth Headland Link).

KEY:	LARGE POSITIVE **(+++)**	MODERATE POSITIVE (++)	SLIGHT POSITIVE (+)	NEUTRAL (**0**)
	LARGE NEGATIVE (---)	MODERATE NEGATIVE (---)	SLIGHT NEGATIVE (-)	

Option 2:
Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

This option consists of a bus Park and Ride and bus priority scheme providing a link along the Penarth Cardiff Barrage Corridor. The option includes the following elements:

- Provision of a bus Park and Ride facility utilising an existing overflow parking area at Cosmeston Lakes Country Park.
- Provision of bus priority measures (where feasible) along the bus route from the Park and Ride facility to Cardiff Barrage i.e. along B4267, Westbourne Road, Stanwell Road, Albert Road, Clive Place, St Augustine's Crescent, Paget Place and Paget Road to provide access to Cardiff Barrage.
- Continuation of the bus route across Cardiff Barrage to provide direct access to Cardiff Bay and onto Cardiff city centre.

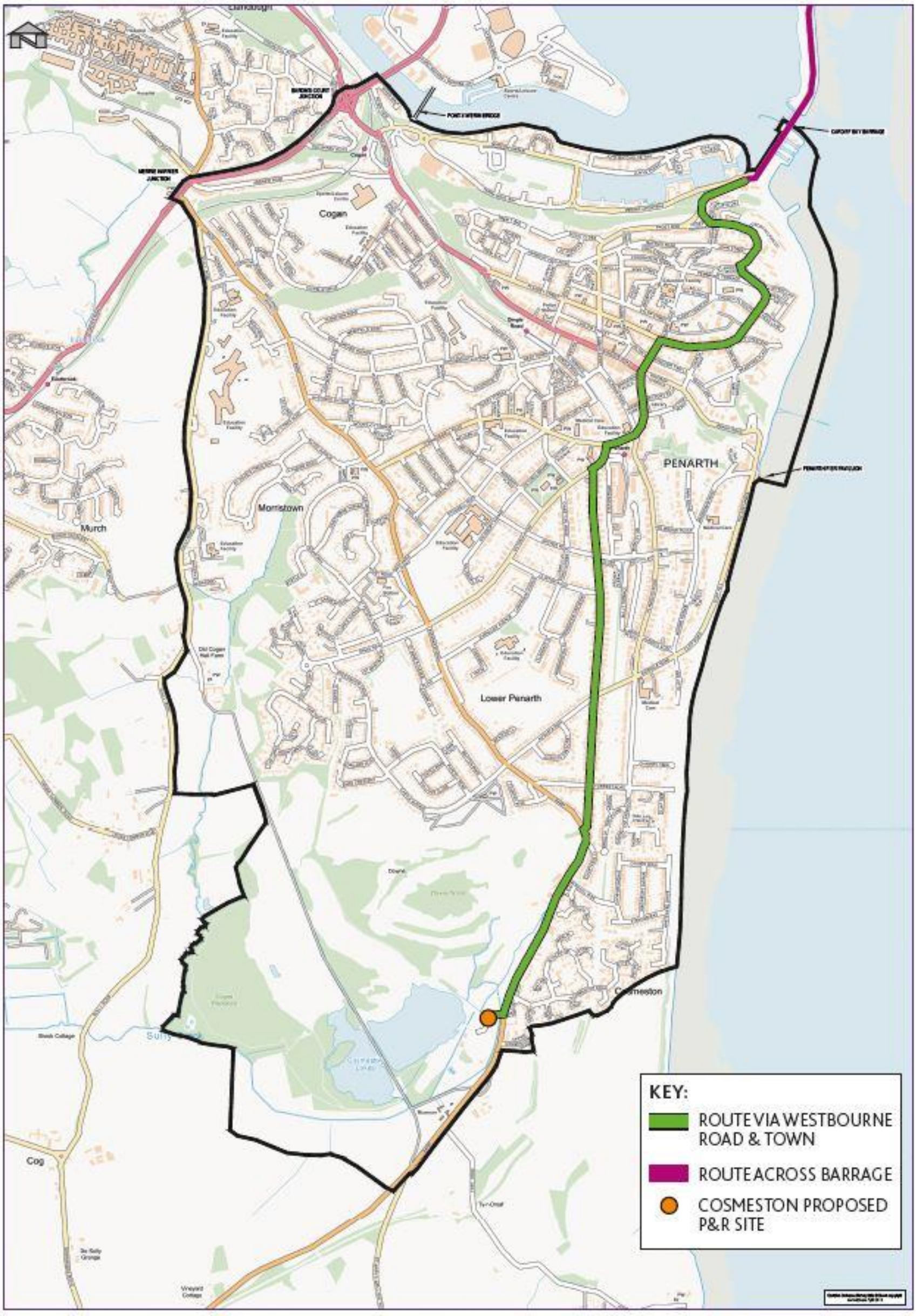


Figure 3 – Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

Option 2 Review

Table 4 - Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

Problems Addressed	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution. • Volume of traffic is a barrier to walking and cycling. • High levels of car use and low levels of public transport usage. • Sustainable transport options not an attractive alternative to car travel. • Unreliable and slow journey times of bus services. • Lack of Park and Ride facilities limits opportunities for Public Transport interchange. • Low levels of Active Travel. • Lack of facilities for cyclists at trip origin and destination. • Road traffic emissions and congestion contribute to reduced air quality in some areas. • Poor connectivity to wider area reduces potential for tourism and leisure visitors.	
Objectives Appraisal	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel	++
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes	++
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being	++
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment	++

	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment	+
Advantages / Disadvantages	**Advantages** • May increase attractiveness of public transport over the private car for journeys into Cardiff. • Would provide a more frequent and direct link between Cardiff Bay and study area removing the need to travel via Cogan and/ or Cardiff city centre. • Would reduce bus journey times between Cardiff Bay and the study area. • The proposed bus route avoids existing areas of congestion on routes from Penarth into Cardiff (e.g. Barons Court junction). • Provides a Park and Ride option for commuters in an area where there are currently limited Park and Ride opportunities available. • The proposed Park and Ride site utilises an existing parking area. • The proposal will provide a direct public transport link between leisure/ tourism destinations (i.e. Cosmeston County Park and Cardiff Bay).	**Disadvantages** • May reduce attractiveness of the existing walking and cycling route over Cardiff Barrage. • Has potential to reduce attractiveness of currently operating bus routes (e.g. bus corridor via Windsor Road/ Penarth Road). • Proposed route would miss the main alighting point in Penarth town centre (Windsor Terrace). • Much of route would travel along existing highways with other traffic. Congestion in areas along the proposed bus route are likely to have a negative impact on bus journey times (e.g. within Penarth town centre and in Cardiff city centre). • Limited catchment at Cosmeston for a Park and Ride as will mainly attract users from the Sully and Lower Penarth area and will require potential users to divert from the main highway network.

Constraints / Dependencies	**Constraints** • Technical and operational challenges relating to the introduction of buses on Cardiff Barrage. • Under the Barrage Act, water traffic has priority over road traffic to enter/ exit the Cardiff Barrage. This would limit the frequency of bus services that can be provided over Cardiff Barrage. • Lack of highway space to implement bus priority measures along route between Cosmeston and Cardiff Barrage – which will reduce the attractiveness of the service. • Potential attractiveness of Cosmeston as a Park and Ride site due to distance from A4055. • Bus servicing the Park and Ride may need to operate as a supported service. • Cardiff Council's LDP highlights use of land owned by Associated British Ports to potentially use as the bus route at the Cardiff Bay end of the Barrage - may require land purchase.	**Dependencies** • Cardiff Barrage is under the control of Cardiff Council. • Potential conflict between buses and existing users (pedestrians and cyclists) of Cardiff Barrage. • Importance of Cosmeston Lakes Country Park as an environmental, heritage and visitor attraction – would need to ensure the Park and Ride proposal does not have a negative impact. • Potential ongoing revenue costs linked to the operation of the bus service.

KEY:				
	LARGE POSITIVE (**+++**)	MODERATE POSITIVE (**++**)	SLIGHT POSITIVE (**+**)	NEUTRAL (**0**)
	LARGE NEGATIVE (**---**)	MODERATE NEGATIVE (**---**)	SLIGHT NEGATIVE (**-**)	

Option 3:
Cogan Multi-Modal Sustainable Transport Interchange

This option includes improvements to Cogan Station to create a multi-modal interchange facility and improve integration between rail and other transport modes. A previous masterplan study has been completed on behalf of Transport for Wales by consultants WSP. The option proposals presented are based on output from this study.

Proposals could include:

- Provision of additional Park and Ride car parking spaces through development of vacant land at the eastern end of the site, and/or potential development of the existing Travis Perkins site. The constraints of the site and available space may limit the combination of measures that are progressed.
- Provision of an 'Access for All' bridge over the railway line.
- Improvements to the highway access onto the site (i.e. from A4160 Windsor Road and potentially the provision of a fourth arm on Cogan Hill roundabout).
- Improvements to existing station facilities (e.g. provision of a new ticket office, customer toilets, cycle parking and improved passenger waiting areas).
- Provision of a new bus and taxi interchange facility.
- Active Travel improvements within and to the interchange facility.

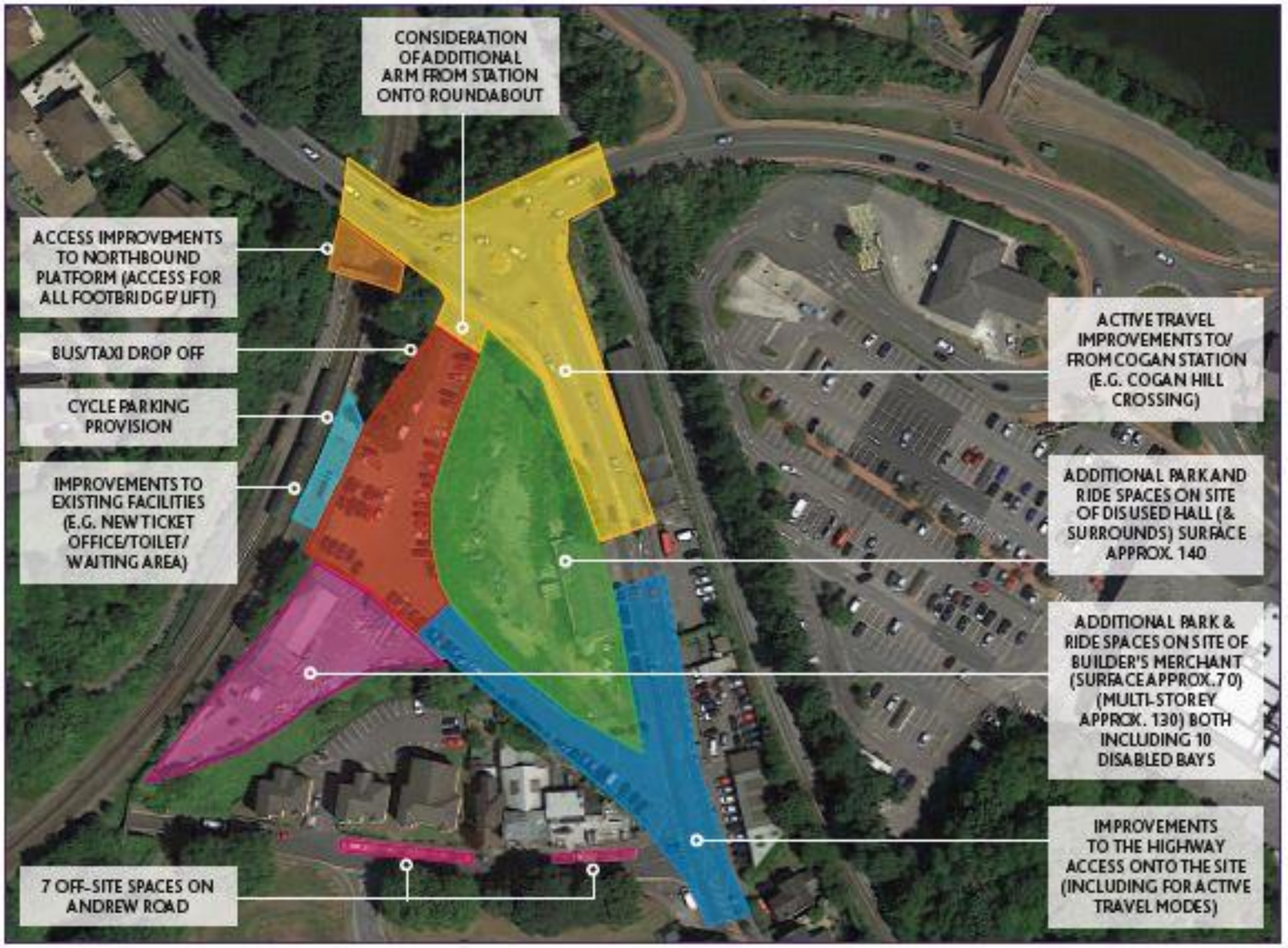


Figure 4 – Proposals for Improvements to Cogan Interchange

Option 3 Review

Table 5 - Cogan Multi-Modal Sustainable Transport Interchange

Problems Addressed	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution. • Volume of traffic is a barrier to walking and cycling. • High levels of car use and low levels of public transport usage. • Sustainable transport options not an attractive alternative to car travel. • Unreliable and slow journey times of bus services. • Lack of Park and Ride facilities limits opportunities for Public Transport interchange. • Low levels of Active Travel. • Lack of facilities for cyclists at trip origin and destination. • Road traffic emissions and congestion contribute to reduced air quality in some areas. • Poor connectivity to wider area reduces potential for tourism and leisure visitors.	
Objectives Appraisal	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel	+
	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes	++
	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being	+
	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment	++
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment	+

Advantages / Disadvantages	Advantages • May increase attractiveness of sustainable modes by providing opportunities for rail Park and Ride, bus interchange and improved active travel infrastructure. • Station benefits from a frequent rail service (currently a 15-minute service frequency Monday to Saturday). • Vacant land available on the site that could be developed as an expanded Park and Ride facility. • Will increase connectivity of the study area with the wider region. • Will provide opportunity to improve accessibility at Cogan Station for pedestrians, cyclists and those with restricted mobility (e.g. via replacement and/ or addition of accessible crossing). • May provide opportunity to improve crossing of the A4160 Cogan Hill.	Disadvantages • Would require access/ egress onto the busy A4160 Andrew Road junction with the potential for future traffic increases due to expansion of Penarth Leisure Centre to include a Well-being Hub. • Will not benefit those wishing to interchange onto/ from the Penarth branch line. • Increased parking availability at Cogan Station could increase existing congestion on the A4160 Cogan Hill/ Windsor Road and at the Barons Court junction. • Current active travel journeys to the station may be replaced by private car if parking is made available.
Constraints / Dependencies	Constraints • High capital investment needed to deliver the proposal. • Technical challenges in delivering improvements on an operational railway and levels/ topography of the site. • Constraints of the site may impact on the package of measures that can be delivered. • Some elements of the proposal	Dependencies • Transport for Wales have responsibility for improvements to the rail network. The scheme would need to be progressed and delivered by Transport for Wales. • Stakeholder agreement from bus operators, Transport for Wales and

	require land acquisition. • Busy access/ egress onto A4160, difficulties in providing alternative highway access arrangements onto the site (e.g accommodation of an extra arm on roundabout) and existing congestion problems on the A4160.	Network Rail. • Purchase of land in private ownership. • An Air Quality Management Area has previously been in place along a section of Windsor Road – need to ensure the proposal would not have a negative impact on local air quality.

KEY:				
	LARGE POSITIVE **(+++)**	MODERATE POSITIVE (++)	SLIGHT POSITIVE (+)	NEUTRAL (**0**)
	LARGE NEGATIVE (---)	MODERATE NEGATIVE (---)	SLIGHT NEGATIVE (-)	

Next Steps

Following your feedback a Stage Two WelTAG report will be produced and submitted to the Vale of Glamorgan Council for their review. The report will include an outline of work that would be required as part of a WelTAG Stage Three Full Business Case appraisal should one or more of the options be taken forward.

Thank you for taking the time to attend today's event.

Appendix B – Public Questionnaire

CAPITA

VALE of GLAMORGAN
BRO MORGANNWG

Astudiaeth Coridor Trafnidiaeth Gynaliadwy Morglawdd Penarth Caerdydd
WelTAG Cam 2

Diolch am roi eich amser i roi sylw i'r tri dewis arfaethedig. Byddem yn ddiolchgar pe gallech chi ateb y cwestiynau isod er mwyn ein helpu i gael syniad o'ch barn am y dewisiadau.

Caiff yr ymatebion a gawn eu hymgorffori i adroddiad WelTAG Cam 2 a byddant yn helpu i benderfynu ar bwyslais yr astudiaeth wrth fwrw ymlaen.

1. A wnewch chi roi eich barn ar bob dewis. **Ticiwch UN blwch ar gyfer pob dewis.**

Fe hoffwn i weld...	Dewis	Cytuno'n gryf	Cytuno	Ddim yn cytuno nac yn anghytuno	Anghytuno	Anghytuno'n gryf
	1. Cynigion Teithio Llesol ar gyfer Coridor Morglawdd Penarth Caerdydd					
	2. Cyfleuster Bysiau Parcio a Theithio Cosmeston a Chyswllt Bws Blaenoriaethol dros Forglawdd Caerdydd					
	3. Cyfnewidfa Drafnidiaeth Gynaliadwy Aml-foddol Cogan					

2. A oes unrhyw agweddau ar y dewisiadau arfaethedig yr ydych chi'n eu hoffi'n arbennig, neu nad ydych yn eu hoffi'n arbennig?
Gwnewch sylwadau ac ewch ymlaen i'r adran sy'n dweud 'sylwadau ychwanegol' os mynnwch chi.

Dewis	Rwyf yn HOFFI'R rhannau hyn o'r cynigion...	NID WYF yn hoffi'r rhannau hyn o'r cynigion...
1. Cynigion Teithio Llesol ar gyfer Coridor Morglawdd Penarth Caerdydd		
2. Cyfleuster Bysiau Parcio a Theithio Cosmeston a Chyswllt Bws Blaenoriaethol dros Forglawdd Caerdydd		
3. Cyfnewidfa Drafnidiaeth Gynaliadwy Aml-foddol Cogan		

CAPITA

3. I ba raddau ydych chi'n credu y bydd y dewisiadau arfaethedig yn llwyddo i gyflawni'r amcanion canlynol? Nodwch rif rhwng 1 a 5 yn y blychau isod, gan ddefnyddio y raddfa canlynol:

1 DIM O GL
2 RADDAU BACH
3 I RADDAU CYMEDROL
4 I RADDAU FAWR
5 I RADDAU FAWR IAWN

		1. Cynigion Teithio Llesol ar gyfer Coridor Morglawdd Penarth Caerdydd	2. Cyfleuster Bysiau Parcio a Theithio Cosmeston a Chyswllt Bws Blaenoriaethol dros Forglawdd Caerdydd	3. Cyfnewidfa Drafnidiaeth Gynaliadwy Aml-foddol Cogan
Amcanion	Lleihau dibyniaeth ar geir preifat ac annog ffyrdd mwy cynaliadwy o deithio			
	Lleihau'r rhwystrau sy'n cyfyngu ar gyfleoedd i ddefnyddio moddau cynaliadwy o drafnidiaeth			
	Cynyddu dewisiadau trafnidiaeth cynaliadwy i wella hygyrchedd ar hyd coridor yr astudiaeth			
	Cyflawni gwelliannau trafnidiaeth cynaliadwy tymor hir sy'n annog mwy o weithgarwch economaidd ac sy'n cefnogi buddsoddiad hirdymor.			
	Cyflwyno mesurau trafnidiaeth cynaliadwy sy'n gwarchod a gwella'r amgylchedd hanesyddol, adeiledig a naturiol.			

4. Sylwadau ychwanegol

Diolch.

CAPITA

VALE of GLAMORGAN
BRO MORGANNWG

Penarth Cardiff Barrage Sustainable Transport Corridor Study
WelTAG Stage Two: Public Consultation

Thank you for taking the time to review the three proposed options. We would be grateful if you could complete the questions below to help us gain an understanding of your opinions of the options.

The responses received will be incorporated into the WelTAG Stage Two report and help to determine the focus of the study going forwards.

1. Please can you give us your opinion on each option. **Please tick ONE rating for each option.**

I would like to see…	Option	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
	1. Active Travel proposals for the Penarth Cardiff Barrage Corridor					
	2. Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage					
	3. Cogan Multi-Modal Sustainable Transport Interchange					

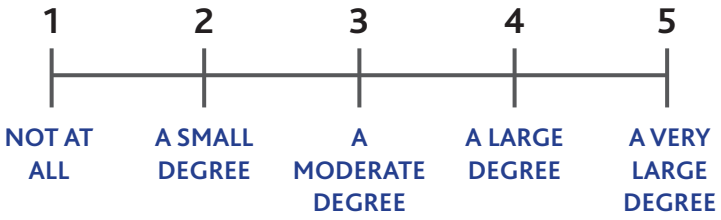
2. Are there any aspects of the proposed options that you particularly like, or dislike?
Please comment and continue on the section marked 'additional comments' if you wish.

Option	I LIKE these parts of the proposal…	I DO NOT like these parts of the proposal…
1. Active Travel proposals for the Penarth Cardiff Barrage Corridor		
2. Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage		
3. Cogan Multi-Modal Sustainable Transport Interchange		

CAPITA

VALE of GLAMORGAN
BRO MORGANNWG

3. To what extent do you believe the proposed options will be successful in achieving the following objectives? Please mark a number between 1 and 5 in the boxes provided, using the following scale:



		Options		
		1. Active Travel proposals for the Penarth Cardiff Barrage Corridor	2. Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage	3. Cogan Multi-Modal Sustainable Transport Interchange
Objectives	Reduce reliance upon the private car & encourage more sustainable modes			
	Reduce barriers that constrain opportunities to use sustainable modes of transport			
	Increase sustainable transport options to improve accessibility along the study corridor			
	Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment			
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment			

4. Additional Comments

Thank you.

Appendix C – Full Set of Questionnaire Results

Headline Results

In terms of basic opinion, **Option 1** was deemed the most positive (82% agreeing or strongly agreeing) with the principal, 11% against (disagree/strongly disagree).

Option 2 gained mixed results, with 50% in favour (agree/strongly agree) and 34% against (disagree/strongly disagree).

Option 3 was the least favoured option, with 37% either disagreeing or strongly disagreeing, and 29% agreeing/strongly agreeing.

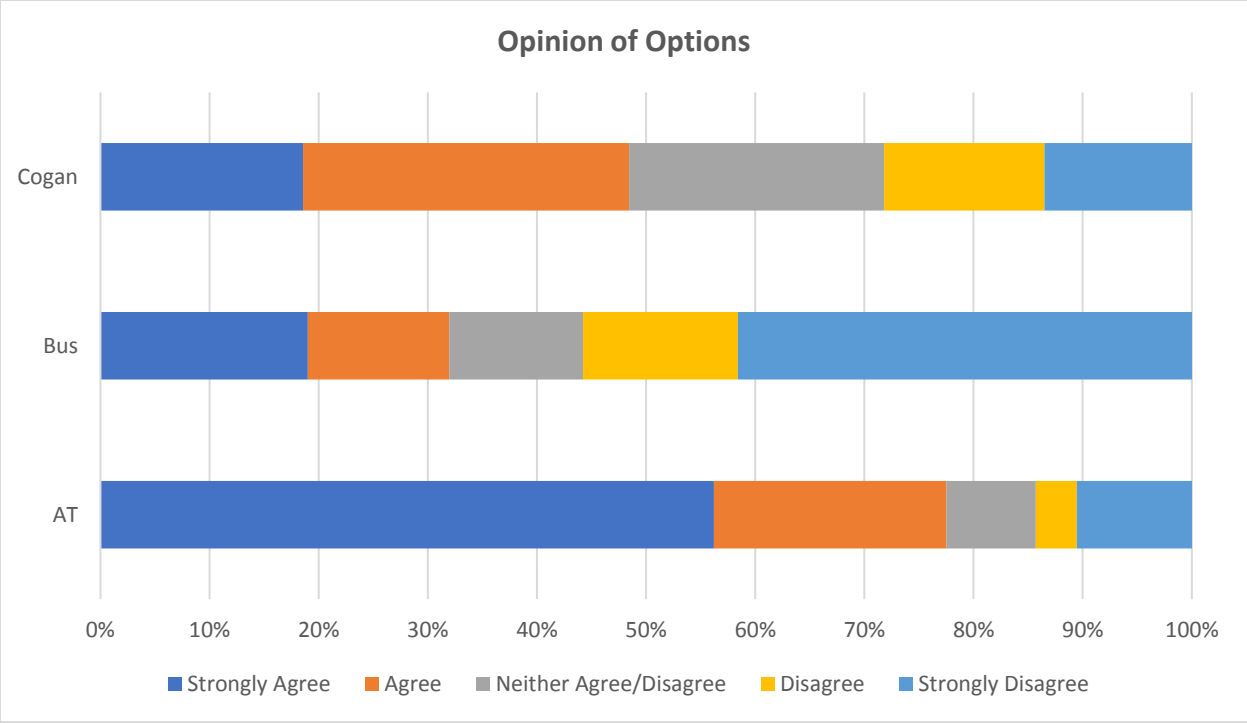
In terms of how well the option meets the objectives, **Option 1** scores the highest, **Option 3** the lowest.

A number of common concerns were alluded to in Question 2 and 4 (additional comments), most common themes are shown below:

Option 1	**Option 2**	**Option 3**
Not ambitious enough	Concern about Buses on Barrage	Concern P&R will create traffic
Headland Link = Mixed Response (majority towards positive comments)	Concern Cosmeston bad place for P&R	Concern P&R in the wrong location
Should be targeted to consider routes to schools	Concern of route along Westbourne Road	Not ambitious enough
Doesn't capture much of the study area (e.g. Cogan/Redlands Rd)		
20mph limit supported		

1. **Please can you give us your opinion on each option. Please tick ONE rating for each option**

I would like to see	Option	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
	1. A/T	240	91	35	16	45
	2. Bus	79	54	51	59	173
	3. Cogan	77	124	97	61	56



2. Are there any aspects of the proposed that you particularly like, or dislike?

Option	Like	Point Repeated (x)?	Do Not Like	Point Repeated (x)?
Option 1				
1	Low cost solution in part	1	Not ambitious/wide enough/enough priority given to cyclists & pedestrians	14
	Can also attract people into Penarth and vice-versa Cardiff Bay and Cardiff	6	Expensive to build, possibly take a long time to put in place	1
	Think hill puts people off, this addresses that	3	Rubbish / General Negative	5
	We need more safe walking/cycling routes in Penarth	8	I do not see any improvements at all	2
	Penarth Headland Link K	39	Penarth Headland Link K (Inc. NRW concerns about SAC)	11
	Link I	2	Cliff top route could be extended to where it meets the gates (by fields)	1
	Good for older people & families	2		
	Like extension of cycle routes across town and walking routes	8	No off-road routes included	2
			Not enough for people with reduced mobility	1
	New walkway	1	No consideration of Redland Road route (connect onto Penarth Road)	1
	How do you travel onto destination?	1		
	Cycle parking	2	Idea of shared routes, should be separated	3
	Another commuter option	2		
	Health benefits	7	Doesn't solve Windsor road	1
	Economic benefits	5	Needs to link to buses / trains	2
	General Positive	17	None of the options go from Cornerswell Rd to Cardiff Civic Centre	1
	Nice to see Active Travel considered by VoG council	3		
	20mph limit	3	Cycle lanes – waste of money/dangerous/not enough	13
	Dropped kerbs	2		
	Will encourage modal shift	12	Costs	1
	Increasing use of barrage	5	Need more signage	2
	Fundamental due to housing developments	1	Doesn't do enough to reduce car use	2
	More accessibility and signage	3	Slower speed limits, and take away parking	2
	Environmental Benefits	2	Should include Sully	6
	Link A	1		1

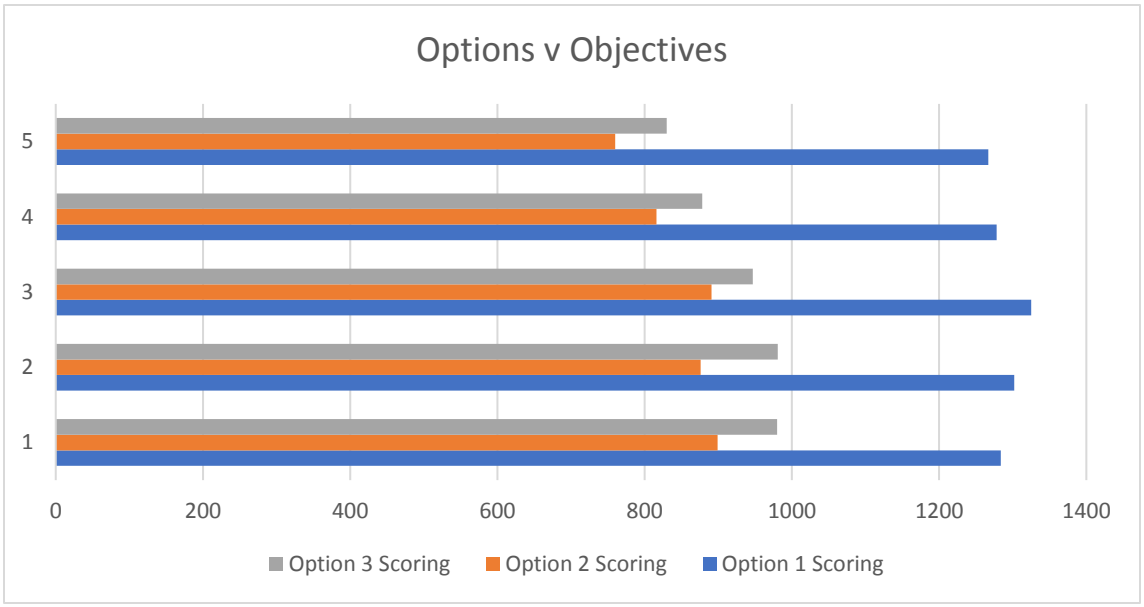
	Next bike opportunity	1	Option should be implemented along with Option B	
Option 2				
2	Nothing	22	Option 1 far better	1
	Good use of Barrage Rd	2	Not sure if Penarth traffic will be captured/P&R at Cosmeston in wrong place/increase Lavernock Rd traffic	7
	The Link	1	Rubbish/Do not like	6
	Good for those who can't walk/cycle	2	Route concerns (Westbourne Road/Barrage Hill)	4
	Improved public transport	5	Will have little impact	3
	General Positive	14	Cosmeston car park is already well used in daytime	2
	Way to avoid Cogan Spur	1		
	Good – if bus stops are provided along route	4	Environmental degradation / community impacts @ P&R	10
	Could get people out of cars / reduce car use	5	Concern over safe walking/cycling environment on barrage being lost if motor vehicles allowed	48
	Good for likely development at Cosmeston	2		
	Only positive if electric bus/zero pollution mode used	5	Only helps minority	2
			Location	6
	May ease traffic at Baron's Court	2	Concern that opening to Buses will later encourage taxis/cars	2
	Reduces traffic through Penarth	2	Westbourne Road Parking Impact/Air pollution impact	2
	Encourages modal shift	4	Space on Barrage	3
	Good if speeds are kept low across the barrage	1	Should not allow buses on the barrage	30
	Good for tourism	1	Needs to be before Cosmeston, consider Barry traffic	4
	Park & Ride	5		
	Would provide alternative to Windsor Rd congestion	2	Not everyone going to Cardiff City Centre	1
	Need to ensure there is enough parking	1	None of the options go from Cornerswell Rd to Cardiff Civic Centre	1
	Sully playing fields as alt location	1	Why turn a country park into a car park?	1
	Reduce traffic coming from Barry etc.	1	Strongly against / terrible idea	4
	Uses existing parking provision	1	Doesn't help Barry or Dinas Powys	1
	Good for those who find walking the barrage hard	1	Why next extend the railway?	2
			Buses unreliable / barrage effect	6
	Utilises Barrage	1	Congestion on Lavernock Rd	2

	Opportunity for green infrastructure	1	P&R encourages car dependency	2
			Only serve Sully & lower Penarth	1
			Needs stops in addition to P&R	1
Option 3				
13	Smarten up entrance to Cogan/Penarth	1	Not Ambitious/Too narrow an option/doesn't address traffic issue in Penarth (wrong location)/will increase traffic through Penarth	34
	Cycle Parking	7	Concern that Penarth station would close	1
	Active travel improvements	13	Rubbish/Waste of money! / general negative	16
	Strong intention/General Positive	23	The massive impact of more traffic issues because of car park/health hub. Parking should cost in order not to discourage shoppers going to Cardiff	4
	Encourages use of public transport if all running smoothly	3		
	Trains are quicker/attractive than buses	4	Expensive	3
			Limited improvement for AT	5
	Great idea – sorts out station/ improvements	9	Should focus on integrated ticketing	2
	Cogan under-used	1	Will have little impact	5
	Will the tunnel be open under the road?	2	Priority needs to be given to pedestrians/cyclists – not cars	5
	Increase accessibility	5	Does not include 2nd station for Penarth trains	1
	Location	1		
	Additional parking	5	Does not address issue of road width over bridge	1
	Long term improvements	2	Still only one lane to the site	1
	Will the tunnel be open under the road?	2	Can the site cope with addition housing in VoG?	1
	Nothing	3	P&R in area already congested	2
	Modal shift	3	Will make Windsor Rd worse	6
	Larger hub would be excellent	1	General negative	6
	Potential for integration with Metro Scheme	2	Most Penarth residents don't use Cogan	1
	Will the tunnel be open under the road?	2	None of the options go from Cornerswell Rd to Cardiff Civic Centre	1
	Potential reduction of traffic at Barons Court	2	Need link to Penarth Line (new station, bridge, new line)	6

	Addresses poor air quality in the area	1	Possibility for pedestrian link to Point Werin Bridge?	1
	Opportunity for Green infrastructure	1	Problems with trains (full, reliant)	6
			Must not be connected to Dinas Powys bypass	1
			Not sustainable enough (Inc. long comment)	2
			Why Cogan? Wrong location	3
			Bring all transport to a focal point = bigger problem	2
			Should include Sully in options	6
			Encourage more congestion	6
			Once got to Cogan, past the worst traffic so will continue into Cardiff	1
			development of the interchange will not maximize opportunities for green infrastructure/sustainable drainage	1

3. **To what extent do you believe the proposed options will be successful in achieving the following objectives? Please mark a number between 1 and 5 in the boxes provided, using the following scale**

Objective	Option 1 Scoring	Option 2 Scoring	Option 3 Scoring
Reduce reliance upon the private car & encourage more sustainable modes	*1,291*	*902*	*984*
Reduce barriers that constrain opportunities to use sustainable modes of transport	*1,309*	*879*	*984*
Increase sustainable transport options to improve accessibility along the study corridor	*1,333*	*894*	*950*
Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment	*1,285*	*818*	*880*
Introduce sustainable transport measures that protect and enhance the historic, built and natural environment	*1,274*	*762*	*832*


Options v Objectives
5
4
3
2
1
0
200
400
600
800
1000
1200
1400
Option 3 Scoring
Option 2 Scoring
Option 1 Scoring

4. Additional Comments

- Park and Ride should include EV charge points.
- I am hugely in favour of the Headland Link. This can benefit not just commuters, also tourists, Next Bike users, takes cyclists away from polluted roads. Also, work to strengthen the cliffs will need to be carried out sometime soon so developing this link will address this. Chris Loyn proposed a cost-effective causeway. A red-light warning is proficient for Sully Island. Penarth would effectively be opened up, Esplanade/Pier traders receive a boost. School trip potential – geology etc. etc. will put Penarth in closer touch with the sea! A regular reminder every time it is used. Some cyclists will find St Augustine's Hill too much – this will help.
- Expand the existing hire bike scheme from Central Cardiff to Penarth. Possible use of electric bikes to help with the hill from the Barrage.
- Possible subsidy of train fares from Penarth. Higher frequency train service at peak times.
- Chop kerb side trees in Hickman Road – HSE matter. Promote car share with assistance to online share companies. Provide incentives to cars with more than one occupant. Provide restrictive sanctions for owners of outsized passenger vehicles. The causeway proposal is expensive and has no real benefits to transport in the area. Promoting cycle transport comes with responsibilities – 20mph for motor vehicles – no such restrictions exist or are suggested for cycles. The quality of all road surfaces in the area is inconsistent with safe cycle use. There is tellingly no provision for pedestrians to safely access Tesco's ****. The rail link from Penarth to the Cogan Spur should be converted to tramway to allow both trams and motor vehicles during rush hour – controlled by priority given to trams and directed to alleviating queues of traffic in Windsor Road. Alternative to causeway construction – tunnel at base of cliff to accommodate rail and bus services across Barrage – stabilise eroding cliff. Consider suspended cantilever footpath at top of cliff, all solutions require consistent maintenance.
- I really don't want buses along the Barrage.
- Favour reduction of speed.
- Option 1: Would like to see inclusion of safe routes to school – e.g. Clinton Road, Evenlode Avenue from Cycle Path. Arcot Street – one-way v. dangerous for cyclists. Where is the provision for linking schools cycling to commuter routes – most of Penarth is families. Clinton Road & Evenlode Road/Larkwood Avenue cycle link to cycle path.
- As someone who commutes daily to Cardiff and gave up driving two years ago in favour of cycling, the introduction of cars and/or buses across the Barrage would damage my current experience and push me back to using the car. The barrage is a busy commuting corridor for cyclists at present because it is of road and safe from cars, as well as providing stunning views. Cardiff Council has plans to introduce a "Cycling Corridor" from Penarth across the Barrage, should the Vale Council not try to encourage the same rather than to propose the introduction of large vehicles that will destroy what we have now?
- The proposed 'sharing' of the Headland Link between cyclists and pedestrians has potential dangers for both. A separation (e.g. raised kerb) would provide separation and reduce the risk of collisions.
- Without criteria that address aims, it will be difficult to assess success. Will there be studies before and after? Very important to the health of the Vale. Social inclusion and equity more critical than historic environment.
- Transport for Wales and Cardiff Bus issue cards that work like the Hoister cards for London Transport. It is only necessary to issue by both agencies a SINGLE card that work on all the transport options we can use. A loaded card can be used to go to town by bus and come back by train – the cards already exist and they a largely popular – you could solve many problems with a Multy ticket to multy transports.
- I am seriously concerned that allowing buses across the Barrage will create a precedent and facilitate eventual extension of use to taxi and cars. The importance of the Barrage as a traffic free quiet place of enjoyment should be respected.
- Option 1: Paint is not infrastructure. There are no plans to restrict motor traffic access of reduce private vehicle usage. Why not pedestrianise the Esplanade, High St and make an active travel corridor down to the Custom House?
- Option 2: Bus access to the Barrage NO NO NO! People won't use bus when it's still made easy to drive everywhere.
- Option 3: Not ambitious enough. Should be a link under the road to the Marina and Bay trail.
- None of the plans will make any significant effect on modal shift. Be more ambitious: build high quality, separated cycleway infrastructure and restrict through traffic on residential streets.
- An integrated ticketing system such as the London area Oyster Card and Octopus Card in Hong Kong would solve many of the issues highlighted. I want to use the bus more. However, as I have a train season ticket for commuting, I

don't want to spend money on another system. Please explore 'off the shelf' integrated systems available, kind regards [personal e-mail redacted].

- Option 1: The active travel ideas are good if it goes along with a campaign to "Get on Your Bike".
- Option 2: Cosmeston car park is already well used by Park Users! They are important as it the environment of th4e park and the wildlife within. I cannot see how economic activity is encouraged by any of the proposals which seem to be about getting people into Cardiff for work/shopping. [Unsure] buses are a good idea, but the Barrage is NOT wide enough for traffic and is a nature environment. Isn't it an SSSI? Westbourne Road is RESIDENTIAL – it may look long and straight, but it is NOT wide enough.
- Option 3: This idea merely encourages more traffic through Penarth from Dinas/Sully to park at Cogan. No benefit to Penarth can be visualised. Traffic at the Baron's Court and Tesco mini roundabout will be appalling.
- The problem starts in Barry and the Vale. Car drivers etc. need to be discouraged there and car parking etc. provided.
- I think the best of options 1 and 2 would complement each other. The same can be said for 1 & 3. People should be encouraged to walk and cycle to Cogan station and not to drive there. The same for the Option 2 bus link. I don't think journey time will attract people to get out of their cars at Cosmeston and take bus in from there with no bus priority. But local people will get bus direct.
- The Penarth Headland Link should be supported strongly.
- Rubbish. We require a bus service from Merrie Harrier to the bottom of Redlands Road (Cornerswell Road).
- Need to understand <u>why</u> people are travelling e.g. parents doing the school runs, dropping children off at school then driving to work – need P&R or other alternatives located near schools? Why don't people use the trains? We have <u>3</u> stations to choose from! Maybe just need a local campaign to promote/incentivise people to use trains and buses if they are not keen on active travel? Shifting behaviours is hard!! Crazy idea: airport-style travellator to help people/cyclists up the steep hill from the Barrage. Extend Next Bike scheme to Penarth and have e-Bikes as part of this.
- Please could you address cycle paths within Penarth. I think this would reduce a number of short journeys made in cars around the town. Better crossings at useful points would help, I'd allow my children more independence to walk themselves places which I don't consider safe at the moment.
- Some parts of the options are very weak and do not enhance or encourage a move away from car use, e.g. line painting of bike lanes. The vision should be far greater in what it wants to achieve, more similar to the Danish model of bike first, car last, option – with great integrated public transport that doesn't cost the earth, literally!
- 20mph zones, good.
- More bike and pedestrian specific corridor across all of Penarth far more valuable.
- First of all, lovely displays and good use of text. However, there is not enough written material on the OBC & FBC cases. Firstly, you need to ascertain what is technically possible and what is the cost envelope. You need to look at "outside the box" ideas such as tunnels around Cogan, escalator such as in Barcelona around Penarth Marina, vehicular railings such as Lynton and Lynmouth connecting Esplanade and Town Centre, plus re-opening tunnel within the Bay.
-
- The Barrage is a wonderful place for families, walkers, cyclists – for everyone. Please don't let it become a motorised corridor. Buses/cars don't belong there. I love seeing families with children walking there and they seem to love it too.
- The Headland Link offers real, positive advantage to Penarth. The opening of a link between the end of the Barrage and Penarth front can be very positive for improving connectivity by bike, increasing visitors and improving health and well-being. With no financial cost to the Vale council the link is a real winner for the Vale, particularly Penarth.
- I feel that any use of the Barrage route by heavy vehicles will have a totally negative effect on its current use as a safe, traffic and pollution free leisure and commuter route.
- The only forward-looking aspect is the Headland Link – everything else is a re-hash of old ideas. The Cogan Park and Ride is too close to Baron's Court Junction and will increase congestion there. The Cosmeston P&R will cause congestion in Sully and along Lavernock Road. Many of the routes on the active proposal are nothing new. A lost opportunity.
- Why not undertake the Active Travel Proposals first without Penarth Headland Link (as the cost of this will be large)? Why not provide bus services along the Barrage anyway, Park and Ride at Custom House?

- Electric Bus. Consider hills and older people shopping and access.
- Consider a cable car with bike front projection hold to go from Penarth Marina up to Paget Road.
- Waste of time! Get the basics sorted out transport wise!
- There is a further pedestrian bridge not on your map which would be used for access into Cardiff.
- I cannot believe that this study has NOT thought of alleviating the cars from Cosmeston new houses!! If Stage One were to be extending the railway line from Penarth @ least to Cosmeston on Phase 1 and then onto Swan bridge as Phase 2 (420 houses planned there!!). Some 2,000 extra cars hitting the junctions Merrie Harrier and Baron's Court. Please think outside the box. The push the above cars to Penarth is unbelievable. Signed C A Lyons, BSc, C.Eng.
- Option 1 needs to include a 20mph zone in all areas of Penarth. This has been done in Cardiff and has been successful. Paget Road and Penarth Marina desperately need a 20mph speed limit – near children's play areas!
- Of the three proposed options the Headland Link has the biggest potential for usurping sustainable transport. Option 3 (Cogan Interchange) is the least practical because it will not discourage drivers to continue their journeys rather than leave their cars at Cogan.
- No statistical data shown to support or show relative impact of each option. This is a "region wide" problem exacerbated by limited existing routes. Seems foolish to approach this on a local basis when impacts are much further reaching. Physical separation is required to give the level of safety necessary to get significantly more people to ride bicycles. And this needs to continue to their destination, not just the boundary of this study.
- The roads must be reduced to 20mph – Cornerswell Road is used as a rat run – even by buses and taxis – no one is watching so they go up to 40/50mph there is a school ON this road and several others either side. Would a one-way road system work in Penarth? Leaving room for separate bike routes. HICKMAN ROAD desperately needs a pedestrian crossing – elderly and those with prams really struggle to cross safely.
- Soft bike park around Victoria School Park for Kids to learn safely on bikes. Or at cliff tops? Parking outside schools needs a ZERO TOLERANCE to get the message across. Could you make Penarth a bike/pedestrian has a right of way over cars etc. Bike paths need to be completely separated by a barrier from the road for people to be safe. Could we have pedestrian/zebra crossings all the way up Cornerswell Road on the roads joining – with a message to drivers that pedestrians have a right of way?
- Until the Dinas Powys bypass is built, these options will not help to resolve the problems in Penarth. The Merrie Harrier junction is a major problem, especially coming out of Redlands Road, or turning right into Llandough Hill from the link road – an accident waiting to happen. The "School run" has not been addressed. Where are the proposals for encouraging active walking to school?
- Would consideration ever be given to re instating/extending rail link from Penarth to Lavernock and locating a Park and Ride near Lavernock?
- The Headland Link is different in scale from the other elements of this option and would deliver commensurately greater benefits across a range of measures from economic benefit and tourism to active travel, health and environmental improvement.
- If drivers are encouraged to drive to Cogan, then the only benefit will accrue to Cardiff. The same point is valid for the Cosmeston proposal but at least this reduces traffic levels in Penarth.
- Air quality at peak times is already low. More incoming traffic to Park and Ride scheme will worsen the effect and only benefit Cardiff. The only option which contributes to active travel is the Headland Link. Painting signs on roads is sticking plasters only. The link also offers considerable economic benefits both locally and through tourism.
-
- The study is very dense and if you're looking for greater engagement from those affected it needs to be simpler and written with less jargon. I can't see either that any of the options will effectively reduce people's choice to drive private vehicles out of Penarth on either of the two main arterial routes.
- Encouraging people to walk and cycle to the Cogan and Cosmeston transport hubs is the only way to go for the long term, and this should be supported with government assisted finance to purchase electric bikes - one cannot ignore the great big hills at both entrance/exit points to Penarth. You need to focus on those people who don't feel that they can make the change to cycling. Run a campaign aimed at very ordinary, possibly not the fittest people. In addition, people who arrive at these transport hubs via active travel should be rewarded with a discount on their onward bus and train travel.... money is a great incentive!! Even a car share is better than cars with only one passenger. Not as good as active travel though. Perhaps a tiered reward system

- Please do, do something, the option number 4 "minimal change" would be a disaster. Another good thing which would really encourage train use is to re-open the old railway connection from Sully to Penarth as a cycle track. I know tons of people who live in Sully who would cycle to Penarth train station to get the train to work in Cardiff if it were safe to do so. The old train track would make a great safe cycle route, plus it would become a tourist attraction as people could cycle from Penarth to the Captain's wife and Sully Island.
- Please don't allow buses on the barrage and tarmac over areas of Cosmeston.
- There's an error in your question 6.
- None of the proposals will work well because the main issue will be the number of cars on the road and by building more houses without improving roads will just cause further delays in commuting from Penarth.
- Need at least a bus service between Penarth and Cardiff Bay. This could go over the barrage. Need to open railway station at Tesco on Penarth line and have a pedestrian link to Cogan station.
- All schemes are just tinkering around the edges. Large scale investment is needed. Go to the Netherlands to see how to encourage cycling by investing in safe, separate and direct cycle ways. The advances predicted in electric cycles, trikes and mopeds would solve the topography issues if these lanes were ever constructed.
- The questions need to be in plain English! What's with all this 'sustainable transport' etc? Far too long-winded.
- So glad somebody have thought of this, just don't think Cosmeston is the right place as people from Dinas Powys and Barry, and sully with still be battling to get to Cosmeston, I think you need more transport links using the barrage
- The plans are all so unambitious. What's needed is a radical shift. So, for example, cycle awareness markings instead of properly separated cycle infrastructure. Park and ride stuff underline an assumption that people will use cars. If you plan for cars, you'll get cars! Sticking a bus route along the barrage (a haven away from traffic at present) rather than solving the real issues with routes into Cardiff is poor stuff. What's so wrong about meeting the problem head on? People complained about smoking bans and plastic bags tax but only the loony right would go back now. Countries who have adopted a bold approach are those reaping the rewards. Having half-hearted watered-down stuff like this does everyone a disservice in the long run. Sorry to be so negative but the plans are all about making as few waves as possible.
- These proposals are so poorly thought-out that they are likely to make congestion and pollution worse rather than better. I suggest you look at Oslo, Copenhagen or Utrecht for examples of how to implement Active Travel Infrastructure properly.
- I'm really pleased to hear about these plans. Cogan station could be so much more user friendly and disability friendly. I commute to Cardiff Centre daily. I mostly catch the train from Penarth as the drive is a bottleneck but if a train is cancelled in rush hour the next train is hard to get on. WHY OH WHY are there only 2 carriages for the Penarth trains around 8am and then they increase to 4 carriages after 8.30 when most people have already gone to work? Strange logic.
- Please do not introduce traffic onto the barrage. This would be a total disaster, stop people (especially families) from walking and cycling across it, and force more people into their cars.
- This is short-term thinking! Very few aspects of these plans contribute in any way to the health and well-being of the local people, nor do they solve local transport problems. Why not ask people to come up with ideas and contribute to the planning process instead of paying "experts" who are not locals, do not use the local roads or transport systems, and do not value the local environment to come up with unworkable solutions.
- Please preserve the bike link as is.
- It's great that there's investment in the infrastructure to imported transport links with Cardiff. However a large proportion of destinations require a car or hours on public transport (try getting to Blackwood or Merthyr on public transport) Also this needs to align with a significant change in work culture where there is an increase in flexi hours etc. because a lot of people hit the roads at the same time, to drop children to childcare and head to work.
- Taking away the safe passage for walkers, cyclists and families with kids who use that to learn to ride bikes is a serious misjudgment. It shouldn't happen and tax payers (us) shouldn't have our monies used for such atrocities
- Without reducing road capacity, it's hard to see how people will be encouraged to stop using their cars in any great numbers. If some start using buses, others will see that the roads are quieter and use their cars more. It needs a significant reduction in road space for the active travel aims to be achieved.
- The barrage is used by pedestrians and cyclists daily. Running buses down that route is dangerous. Large vehicles should not be mixing with vulnerable road users.

- Don’t think anything will encourage active travel into Cardiff city Centre unless it provides a direct route, i.e. it needs to follow Windsor road or the railway line to get out of Penarth.
- What we need are better roads for car users because that’s how most people want to travel. That means compulsory purchase of existing property to widen and create new faster roads to get car users where they want to go. Making car users use modes of transport they don’t want to use by making their travel difficult is not the answer. Not everyone works in Cardiff. Neither is using the barrage other than for its intended purpose. Mixing buses, cyclists and pedestrians is not the answer we want. Cosmeston should not be used as a park and ride, it’s a country park! Perhaps you should stop all the proposed development for Sully and Lavernock. More houses are ludicrous and exacerbates the problem.
- This survey reads as if it is biased to produce results that show that the idea of sending busses across the barrage is in price a good thing. This is wrong. The barrage is good for human powered traffic. I.e. walking and cycling. There are good road alternatives for motor vehicles
- Make dock Hill by customs House one way only for cars (up). This gives more space for cycling and stops cars short cut through marina.
- Hard to answer any of the questions sensibly, when no detail is provided on what any of the proposals are.
- I think all these schemes are poor value for money but most significantly they will have a negative impact. Buses on the barrage will put some people off cycling whilst uptake of bus use will be low and there are already excellent train links to Cardiff. Additional car parking at Cogan will encourage more people to drive through an already congested area.
- There is no ambition in this plan. Nothing joins up properly. Where are the links to Cardiff's cycle plans? This is a climate emergency and painting a few pictures on existing congested roads is not the solution.
- Not a bad idea. I would spend more on active travel. Bus park and rides are a waste of money, they are rarely successful without bus priortisation across the whole route which is impossible due to the current road setup. As my friend calls them giant car parks with no cars! An alternative would be to make Westbourne Road and alternative roads a one-way system which would speed up bus times? The rocky causeway is a great and will be heavily used. I live on Cosmeston Drive and avoid cycling to work in Cardiff bay due to having to go through Penarth town Centre. Any thoughts on linking Next Bike Cardiff with Next bike the Vale? Now that's an idea - I'm aware of the logistic issues and the contractual issue but if you work together it is achievable - London which is far bigger manages it with Santander bikes. This would massively reduce traffic congestion.
- Please go for option 1!!!
- I don’t find your survey very easy to complete
- Approaches to transport and travel need to be drastically different and ambitious. They also cannot be localised. Fiddling around the edges of the current system is not adequate. The high cost to the user of public transport is surely a massive barrier. I would be interested to know how these proposals fit with the Cardiff plans for new links around the city. Please do not build any more pointless cycle paths that make the existing road narrower and therefore more dangerous, encouraging negative attitudes from drivers towards cyclists.
- Put on a 9am train from Penarth to Cogan and make the service more reliable and cheaper and more people will use iOS- then link safe cycle routes to the train stations - or pedal power taxis that take 2-4 people around town!! and a more regular train to the Bay. The bendy bus to the bay is too big- get smaller eclectic ones that go back and fore more regularly. An electric bus from Dimas or Penarth to the bay would help. But not over the actual barrage- this would kill the wonderful asset that has been create down here for traffic free walking and cycling. If you do consider transport on the barrage, then only electric buses or teams and only at limited time if the day- or make the tourist land train free or low fee. Same for the water taxi- this is expensive now so it’s fine for a one-off tourist experience, but it could easily be run much cheaper for commuters and accommodate bikes. Adding park, a ride to Cosmeston will add air pollution to the air that needs considering - it is already a very busy road- not sure how much it will be used. Altering Cogan station to encourage more cars to park there would be an absolute disaster for the people of Penarth and Dinas as this is the bottle neck area. You would be better talking to your oka. I got colleagues and ask them to stop allowing more flats and house to be built in Penarth when clearly the current infrastructure can’t cope. Another option that would really help traffic flow out if Penarth in the morning is to reinforce the bridge over the railway line so that 2 lanes of traffic can equally flow over it here. If you go down to this spot in the morning and watch the traffic patterns you will see big gaps open between the cats at this point which could be

avoided if two lanes could be create- then more cars could get through on the green light. Well done for looking into the options and good luck

- More vision is required to invest in railways and cycling infrastructure and to make these transport options more attractive and cheaper to more people
- This survey would have been more understandable if the questions were accompanied with a brief explanation. The Cogan bus hub should include enhanced bus services in Penarth to feed in. The more frequent and wide spread the services the better the hub will work.
- Whilst I like the investment in the area and improved transport links for cycling and public transport, I strongly feel that these improvements are very long sighted and without other measures will not net a sufficient change in peoples modus operandi. Very few people are going to jump on a bike or bus because of these measures solely. Plus, the number of people travelling to the bay for work is slim compared with those in Cardiff Centre and north east commercial area. What will they do once they get to the bay... walk the rest? These are sensible for long term planning but completely insufficient for the thousands of people for commuting from/through Penarth to Cardiff/ Cardiff Bay. I think the headlands link will improve tourism revenue for Penarth though, but a new car park should be added into this for the pier. To make significant impact on exhaust emissions in the short/medium term would be to free up congestion. The rush hour traffic from Barry, sully and Dina Powys in addition to Penarth cause severe congestion. Consistent allowance of large-scale new build housing projects in this area are compounding the issue. In the short term, I would suggest opening the barrage to Penarth residents (tag system) for commuting at Rush hour (7-9am and 4-7pm Monday to Friday) This will immediately improve flow at the bottle neck at the Barron's Court intersection reducing idle emissions. Along with the proposed improvements, this could significantly reduce emissions and commuter's quality of life. Moving forward, when electric cars become more affordable and common, use of the barrage could then be limited to these vehicles. I suspect very few tourists are visiting the garage in midweek commuting times so should have minimal impact on the tertiary businesses here. I see constantly bus lanes empty whilst waiting for 2 or 3 traffic light cycles before crossing. When the busses do pass, they are 20% full. This is counterproductive to the aim of these lanes and therefore the plan is farcical. The benefits to the few are considerably outweighed by the negatives to the many. Whatever you decide, aiming high and far is never a bad thing but you need immediate tangible results. Lay the structure for the future now but don't ignore the present. Continual improvement methods need to be introduced reviewing current measures effectiveness and amend accordingly.
- I'm glad people are thinking about this. But it's all a bit lackluster. If we are serious about getting people to use sustainable transport methods, we need to make it harder for people take their car. It's the only thing that will force change. My suggestions would be to pedestrianise part of Windsor Road during the daytime, put more actual cycle lanes in, not just drawings on the road every now and then, restrict parking spaces to one per household, get more carriages on the train line that goes through Cogan (the Penarth line I use is actually fine for us even though people using it in the opposite direction seem to struggle). People won't like it. They will get annoyed and write angry letters. But it will change their behaviour. When it takes more effort to drive to the co-op on Windsor road than it does to walk there, people will walk.
- The improvement to the transport corridor will be meaningless without the Headland Link from the barrage to the Esplanade. The hill facing people who cross the barrage deters them from going on to Penarth Town affecting the footfall and impacting economic activity. The increase in housing in the Eastern Vale will further add to the already unworkable rush hour traffic management though the j34 link should help both this and with passenger footfall at Cardiff Airport. There is scope to introduce a regular (electric) circular bus route to access key locations from the Cogan multimodal exchange these should include Lllandough, the Health Hub at Penarth Leisure Centre, Penarth Town, Penarth Station and down to Lower Penarth and back probably using Andrew Road via the restricted junction at the Merrie Harriers. This shuttle would need to be regular and reliable and start early enough to be of use to hospital staff and finish late enough for them and for those visiting patients in Llandough. A small charge <£1 would help to defray some cost. My opinion is that 2x20 seaters with approx. a 15-minute interval would be a good starting point. A consultation with Llandough staff and patients would inform decisions on start finish times and regularity.
- Any transport solutions must start no later than 7am and continue until at least 11pm to have any effect on current travel.
- I am underwhelmed by the proposals. That there are no segregated cycle lanes planned in option 1 is hugely disappointing. I feel the council will be wasting money by trying to please everyone whilst delivering sub-optimal

infrastructure. More should be done to restrict car use (e.g. blocking active travel streets at one end to prevent rat runs, clamping down on on-street parking to provide space for segregated cycle lanes etc.).

- Please be ambitious particularly in promoting active travel. Not everyone can cycle but car free routes would allow nervous cyclists easy access to the bay. Good luck.
- Why give taxis priority for drop off points? They are no different to private cars. Cycle routes need to be physically separated. Make some roads one way to facilitate this.
- All schemes could improve their score on enhancement of historic, built and natural environment by removing more on street car parking and returning streets to the pleasant places they could be, rather than the through routes clogged with parked and idling vehicles that they are. Option 1 makes the active travel proposals as part of the Integrated Network Map sound like a choice. The local council must develop the schemes identified in the INM. If the Links A-K are in the INM they should be developed, they have already had their own consultation in the INM process. This WelTAG consultation makes the INM sound like the INM is an option that could be dropped in favour of doing nothing, a train park and ride facility or a bus park and ride facility.
- We need safer cycle routes. Safe / dry bike storage
- Hopefully these options will reduce the reliance on private cars as parking is a real problem in Penarth. I currently commute by train, but I would cycle if there was a safer cycling option. Taking out the hill would also encourage me to cycle. We also need to link the sea front and the town Centre as Beach Hill puts many people off. Many years ago, there was talk of a funicular railway to link the sea front to the town Centre which would be an added tourist attraction. Or a zig zag path such as the one by the marina would help cyclists and walkers. We would also like to see the cliff top path sensitively widened to accommodate all the users and to extend the cycle route all the way through to Sully. Can the disused railway line be opened up?
- Only by providing segregated cycle lanes will you enable people who want to cycle to cycle. This has to be prioritised over the private car, or single occupancy travel in private cars. Paint does not work, it's a retrograde solution and if anything, it will put cyclists in more danger e.g. encourages close passing, cars parking cycle lanes forcing cyclists in to traffic. The bus will be detrimental to the barrage as a tourist attraction and air quality (if not EV) - perhaps some scope to implement timed route around rush hour Mon-Fri only? Seasonal variations in service when quieter in the winter? No weekend service when barrage is busy with tourists? You could also consider a Congestion Charges, Ultra Low Emission Zones, single vehicle occupancy charges at key sections as long as efficient alternative methods of transport are provided.
- These proposals do not go far enough, a radical rethink is required and investment
- I do welcome the opportunity to debate the region's transport alternatives. I do feel that over the last few years the Vale of Glamorgan has realised its approach is 40 years out of date and is trying to do something about it. I like to think I am ok in terms of health and try not to use the car too much. I am a Barry resident (Nr Porthkerry Park) and I ride to work at the heath hospital (UHW) 3 times a week. Twice a week I do the school run to take my children to schools in Penarth by car. We also use the barrage and Cosmeston park for family time. Sometimes I do use the train Barry via Cogan to Heath High Level. Cars: if you're serious about reducing car journeys you must stop treating cars better than people. Look at every junction in the VoG and it automatically gives priority to the car user. Ban sweeping junctions that do not force motorists to slow down. Simple measures like this. Bicycles: For years councils have deluded themselves into thinking they know what cycling facilities are. They don't. Please google 'Warrington cycle campaign' and click on 'facility of the month' for plenty of UK wide proofs of this statement. Some Vale of Glamorgan examples of incompetence? Wenvoe bus lane excludes bicycles. You either must disregard the sign or risk your life crossing the road to the path on the other side of the road. Millennium Road (Barry dock area) cyclists might be fooled into using this poorly designed facility, so hopefully they'll escape any injury caused by badly located entry and exit points. Colcot Public House: There's a reason why cycle 'lanes' like those are often referred to as murder strips. Walking: To be honest walking takes time, so is only really good for shorter journeys or leisure. The Vale generally provides good facilities, and as far as leisure goes hopefully these facilities won't be turned into car parks or taxi rat runs. Trains: Overcrowded and expensive. Buses: Not good, the main problem being the bus companies seem to think they need to do big loops everywhere. They don't, they just need to move node to node. Example. Journey from Tesco Barry to Cardiff Centre. You could hop on and off buses weycock cross to Culverhouse. Culverhouse to Ely Bridge and Ely bridge to Cardiff Castle. Each bus would simple go around and around it's section and never be far away from you. It would also encourage a little walking

- The barrage is fine just as it is, no need to introduce any vehicles, families and kids have the right to enjoy a safe place
- The cost and safety of the causeway from Penarth Esplanade to the Barrage has been studied and rejected before. The cliffs have continued to erode, and I see no reason to waste further public money investigating this option. I did attend the drop-in event in the Paget rooms, which I found extremely helpful and informative. I did not fill in a feedback form at the time because I wanted to study the proposals in more detail and give myself time to consider all aspects, which I have included in my feedback.
- I see no need whatsoever to send buses over the barrage. I'd prefer to see creation of a sheltered cycleway to encourage truly sustainable transport that also brings health benefits (with the associated nhs savings).
- This is much too small-scale thinking. A proper study needs to think about where the origination of traffic occurs. It is patently obvious that the overwhelming majority of traffic passing through the corridor and the adjacent Dinas Powys corridor does not originate in Penarth. Therefore, highly local sustainable measures will have at best a marginal impact. More thought needs to be given as to how to take out traffic coming into the area from Sully, Barry and the Wenvoe corridors through use of better infrastructure (trains, light rail being put back into the area (instead of a badly used cycle path) and how to clear out downstream areas more quickly (finishing the Cardiff orbital properly for instance). Train frequency needs to be increased and proper parking facilities created in Penarth, instead of the residential streets around the station being used as a gigantic car park to avoid Cardiff city Centre parking. The 20-mph scheme is total and complete tokenism given how congested streets area in the area. The Welsh government and Vale councils need to step up, stop whining about Westminster, stop being so parochial and get busy.
- I am strongly for the general improvements to cycling routes between Cardiff Bay and south Penarth/Sully. I think the old Penarth-Sully railway line should be entirely reopened for active travel (possibly with a new landmark pedestrian bridge over Lavernock Road south of Cosmeston Lakes). This would encourage active travel for commuting and also for leisure, with a pathway which would be mostly through wooden areas and with some landmark points (e.g. sea views from bridges) and connections to the coastal path. It would also attract more people in Sully enhancing the local businesses and the community life.
- I fully support new ideas to reduce the amount of traffic going out of Penarth in the mornings and into Penarth in the evenings. The use of the barrage seems an excellent idea.
- None of these options seem ambitious enough. The active travel option is the most likely to have a real impact but only if it is enhanced to provide segregated lanes on the main roads. Paint and signs do not create a feeling of safety even in a 20mph zone. Sending buses across the barrage would change the nature of this prized asset to Cardiff and Penarth residents. It is a non-starter. To encourage bus use and reduce cars, buses need to go along car routes where they are visible to car drivers.
- I agree with any policy that would reduce car usage. The barrage is a wonderful resource and has encouraged a number of my friends to cycle rather than drive to work. A park and ride from Cosmeston would encourage residents from Lower Penarth to use this facility. However, I would only wish to see this option at peak hours in the morning only. I would certainly not want to see buses on the barrage on the weekends and the evenings, so that leisure cyclists and children can enjoy the facility safely and enjoy the natural beauty- free from traffic pollution and noise. Encouraging motorist to leave their cars at Cogan and either take the train or cycle across Pont y Werin would be progress. Making the roads safer from Cogan to Penarth Road/Taff Trail would encourage me to consider cycling to work rather than take the train to Grangetown/Cardiff Central.
- There is a desperate need to improve sustainable travel in the Vale, but the proposals set out here will not achieve the objectives defined at the beginning of the document. There is scope to increase active travel by creating safe places to walk and cycle, but this will on main roads at least require separation. Proposals 2 & 3 will only move congestion elsewhere and that's if they are successful at all. Rail capacity needs to be increased and that would encourage people to leave the car at home (at present, the valleys line trains are jam packed at peak times). It is not enough to only consider traffic from the study area - this congestion is caused by many travelling from Barry, Sully, Dinas Powys etc. So, solutions that work for Penarth commuters alone is not enough. The Council needs to stop and take stock of the situation. The consultation documents are full of jargon which many people in the community cannot engage with (e.g. multi-modal sustainable transport interchange). The consultation events have also been difficult to engage with if you do not have prior knowledge of transport and sustainability. The Council should find an organisation that can help co-produce these proposals with the communities affected to ensure money is spent

on projects that will achieve the goals. Many large building projects across the area will lead to more traffic and these problems need to be addressed properly now rather than continuing with proposals that will not make a difference.

- With all three options I miss the long-term perspective for the next 20, 40, 60 years - radically away from cars. All studies about bike capitals like Copenhagen, Utrecht, Groningen, etc. show that people ride bikes not because they lead healthier lifestyles or think in more environment friendly terms. People use bikes because it is the most convenient, fastest and cheapest way to get from A to B. Bicycles and public transport should be priortised no matter what. If there was a light rail line connecting Barry, Sully and Penarth in a very reliable and affordable way I would give up our family car instantly.
- PLEASE KEEP THE BARRAGE TRAFFIC FREE! Please introduce a bus route from Cardiff Bay to Penarth - it's incredible that there isn't an existing one - but please do that on existing roads and not across the barrage.
- We need new ideas and new opportunities to enjoy our environment to the full. The link between Cardiff Bay and Penarth does just that!
- Penarth wasn't built for all these cars commuting in & out of the town at rush hour each day. Lovely though it may be to envisage a future with people commuting to work every day by bike, you have to be realistic and admit that, even with less cars on the road, a lot of people can't cycle to work because of physical or simple, practical constraints. Cheap, reliable, frequent modes of public transport must be the answer - but it's not easy and obviously expensive. If any time or money is to be spent on a genuine attempt to solve Penarth's traffic problems, then I would hope that it would concentrate on some sort of commuting hub involving Penarth & Cogan's small but already existing rail network. How about joining the Penarth and Barry/Vale network at Cogan, with a new platform and bridge? How about linking trains & bus timetables? Free parking at the stations for car sharing? A ticket that lets you ride on trains and buses? And above all, obviously, cheaper fares and a reliable timetable. (Though this might involve, at some time in the future, taking the whole network back into public ownership and running it for the public good, not profit ...) I would be happy to see a team of experts spending time and money on working out how to build a transport hub while solving the Tesco roundabout bottleneck, which would impact on the lives of commuters on a daily basis, for example, rather than on improving cycling and walking opportunities for people to enjoy on the odd fine weekend.
- L The Penarth Headland link would enhance the value of the bay area f Cardiff and the Esplanade of Penarth and encourage all ages to use its facilities for exercise (biking and walking). Economically it would give a huge boost to the area.
- A small bus regularly going across on the " New Headland link from Penarth Pier to the Cardiff Barrage "onwards to Mermaid quay is MOST DESIRABLE AS SOON AS POSSIBLE. IT MUST HAVE PEDESTRIAN & PEDAL BIKE LANES. I DO HOPE THIS LINK HAPPENS IN MY LIFETIME. Walking across the beach is most difficult due to the uneven surfaces nowadays. As I have said the Cogan hub is not worth it. May I confirm my comments on a recent meeting at Penarth's Paget Rooms. If it is really intended to reduce car travel, then surely extending the railway line from Penarth to Swanbridge " at least " would be really worthwhile. NOT FOR HEAVY TRAINS but for tram ones which could be built near @ CAF near Newport many are already? ordered for TFWales. Extend the order & then the Vale will be seen to improving the infrastructure before all the houses & school is built in Cosmeston Farm AND the 420 houses on Cog Rd.....Phase 1 would be to lower Penarth, Phase 2 Lavernock, Phase 3 Swanbridge. I have over the years walked the original track mostly light engineering work and lots of tree felling would be required before starting to lay the track.
- I am hugely disappointed by both the poor level of publicity and engagement of this consultation and the quality of the material used within it - not least the poor English and duplication/omission in Q6 of the survey. You have to do better!
- As already stated, the park and ride at Cosmeston is the wrong location if you put this closer to Barry say on the vacant industrial land near the Mc Donald's it would work better
- Addressing the challenges in the relevant corridor require deeper and more considered thinking about existing issues at Sully and planned development at Cog and Upper Cosmeston Farm. To not press for the reintroduction of rail services to Sully is extremely short-sighted, particularly considering Welsh Government's sizeable dividend at Upper Cosmeston Farm. Given that it is communities in Sully, Lavernock and Penarth who will pay the price for these developments, where will Welsh Government's dividend be spent?

- The best solution would be to extend the South Wales Metro rail system through Lavernock and Sully either through Penarth or as a spur from the Barry Line through Dinas Powys. High capacity and frequent tram trains running on a mixture of traditional rail and on-street running could be introduced with little impact on existing infrastructure. Car ownership model will change, and vehicle numbers will inevitably decline in forthcoming decades as the time to eliminate CO2 emissions draws closer. A radical modal shift is therefore required to join up existing and new developments, (both residential and commercial) without the need for feeder journeys to centralised hubs. Should a transport hub or park ride come forward then there is an opportunity to provide electric vehicle charging points.
- Why do you always concentrate on Penarth? No consideration or devices provided for Sully
- The residents of Sully feel very left out of these discussions, we have a very limited bus service and are therefore having to use our cars for journeys which we would love to make on alternative transport if we only had the facility.
- Better trains Better buses and lower the cost and people will start using them
- In the package of active travel proposals, the Headland Link stands out as the one project which will make a major difference for Penarth & the wider Vale and the Cardiff Bay area. A project that should have been built as part of the Cardiff Bay development in the 1990s, its benefits in active travel, tourism and general economic aspects are significant. With an outline cost of circa £10 - £11m it is a major value for money proposal which will be of national significance.
- Cosmeston Park and Ride does not have enough capacity and would lead to displacement parking on local housing estate. Park and Ride to close to Cardiff, many drivers may not use it. If placed in Barry, buses could use the three routes to Cardiff and ease traffic through Dinas Powys, Culverhouse Cross, Sully, Cosmeston and Penarth, and ease the Merrie Harrier Junction. Roads in Penarth are too narrow for bus priority schemes. Unable to operate a regular service over Barrage due to locks gates being accessible at all times to boats. Barrage Road not built for regular/heavy traffic, not forgetting that pedestrians and cyclists would be in close proximity.
- What about looking at car clubs using key parking areas like UHL and having bus links to hospital, so staff use trains/buses as won't need cars at work. If Barrage has to have vehicles on it, should be a train/ tram or similar, fenced off from cycles and walkers!
- You should re-open the Penarth railway line through to Lavernock/Cosmeston, Sully and meeting up with Cadoxton line as it did many years ago. If this line was never closed, we wouldn't have the congestion issues we have. Make compulsory purchase orders on houses in the way. Majority of line space, bridges, tunnels are still available to use.
- Rail travel is the only way to significantly reduce vehicular traffic and encourage active transport methods at each end of the route. Sully is not considered in any part of this study, yet is affected by the proposals, especially the Cosmeston Park and Ride
- I believe that the proposed link between Penarth Esplanade and the barrage, around Penarth Head would encourage more people to cycle/walk from Lower Penarth to the bay and the city. Also, it would encourage people from Cardiff to travel to Penarth Esplanade by bike or to walk rather than driving or taking the bus.
- I feel that Sully seems to be left out of all the transport facilities
- The Headland Link has been talked about for years. At a time when the Vale is contemplating declaring a climate emergency this development would contribute hugely to active travel targets. It's well supported in Penarth. Both Cardiff Bay and Penarth would benefit.
- We are facing a climate emergency. Welsh Government has declared a climate emergency in Wales - what is the Vale council doing to support this? How do the options proposed in this study reflect this? I don't think they do. We need to reduce emissions from the transport sector by 80-90% in the next 30 years which means we have to reduce our dependency on the car. The majority of people commuting from Penarth do so by car - it is essential that these people are incentivised to travel by bus, train, bike or by walking instead to achieve the modal shift that's needed. Unfortunately, I don't think the 3 options proposed - painting bikes on the road, asking people to drive to Cosmeston to catch a bus, or making small improvements to Cogan station, will achieve this. These ideas are not innovative or ambitious and don't adequately reflect the 7 well-being goals within the Well-being of future generations Act. People's travel behaviours are complex and need to be better understood to develop the appropriate solutions. Many people have to take children to school before going on to work which is why the majority of trips are probably done by car. People need to have more sustainable alternatives for the school run e.g. walking buses, safe cycling routes; this should then encourage them to do their onward trip by modes other than the car. We are lucky to have 3 train stations in Penarth - the majority of commutes to Cardiff and beyond should be done by train. How are you proposing to achieve this? To encourage people to cycle to school / work there has to be much safer provision for

cyclists. I cycle to school with my son and watch cars driving far too closely to him on a weekly basis. Painting bikes on the road will not encourage / incentivise people to cycle - they will only do this if the traffic is significantly reduced. Nextbikes have been very successful in Cardiff and should definitely be extended to Penarth - why is this not included in your options? Also, I know the steep hill from the barrage to Penarth is a barrier to cycling - could you introduce a moving 'escalator' (as they have in airports) to enable more people to travel up the hill on foot / bike? I'm sure this would be a far cheaper option than a new footpath around the headland. It concerns me that the options proposed are focused on expensive infrastructure - changing travel behaviours is key to achieving your objectives and could be done through other means e.g. incentives for public transport and active travel (with disincentives to drive), providing personal travel planning advice etc. I'd be interested to know how you plan to achieve this? Cardiff is making progress with cycle super-highways planned, new Metro etc. - surely some of these ideas can be extended to Penarth and beyond?

- With the MASSIVE HOUSING DEVELOPMENTS in Barry, Dinas Powys, SULLY and Lavernock of which most residents will travel by car to Work, Shop, Hospital appointments etc. All Roads lead to the Barons Court intersection which is at GRIDLOCK at PRESENT. While I agree that something has to be done it would appear that the Communities of Sully and Lavernock Do not figure greatly in the calculations and some thought should be given to the possibility of extending the railway from Penarth Station to Sully, that would have a massive impact in reducing the number of cars on the roads at peak times. A PARK and RIDE opposite McDonalds Cardiff Rd. Barry with a new Station and road links to Wenvoe, Sully/ Penarth and Dinas Powys. Myself and many other people I have spoken to agree that it would be the perfect location.
- Something that could have positive impact on the way in which people travel between the Vale of Glamorgan and Cardiff are electric bikes, this is especially true for encouraging movement between Cardiff Bay and Penarth. Electric bikes hold the solutions to the barriers which Penarth face when trying to increase the amount of people travelling actively, they offer that extra support for the difficult gradients in the area, as well as offering a helping hand over longer distance. They also provide a form of active travel which is inclusive, and many people who could not usually ride a bike are able to, such as elderly people or people with a disability. Council's across the UK who face similar barriers to active travel have installed electric rent a bike scheme. Most notably Highlands Council has rolled out a new pilot electric bike hire scheme in Inverness. Carbon CLEVER Cycles is a collaborative project between The Highland Council, Co-wheels car club and SSE which allows users to hire an e-bike from two convenient locations in Inverness, at Falcon Square and Council Headquarters at Glenurquhart Road. The project is part of the Council's vision and commitment to make Inverness carbon neutral by 2025. The Vale of Glamorgan Council could roll out an electric rent a bike scheme from Penarth Station or even Cogan Station to Cardiff Bay station. Cardiff Council already have plans to roll out electric Next Bikes, and Sustrans feel that it would be a missed opportunity if Cardiff Council and the Vale of Glamorgan Council did not link up and utilise this to improve movement and investment between the two destinations. Identifying a train station in the area and making it a sustainable transport hub which follows the below criteria would alleviate congestion in the area. To enable people to travel more sustainably all bus interchanges and train stations should be easily accessible by foot and by cycle, as well as be well serviced by bus routes. Safe, convenient and direct routes should be provided. Particular consideration should be given to the last mile which is often the most difficult part of any journey to a station by cycle or on foot. Walking and cycling routes within and outside principle transport stations should be clearly signed and should be linked up to pre-existing walking and cycling infrastructure in the area. Principle public transport stations should be attractive places to arrive in as well as be accessible from all sides. For example, in Leeds Station they have opened a southern entrance, this is a landmark structure which relieves congestion to the existing northern entrance. They have introduced a future proof ticket gate line capacity and encourage growth in the south of the city by improving pedestrian access. Ticketing should be integrated and allow users to make journeys which are multi modal and across different operators with one streamlined ticket and payment service. Standardised smart ticketing and payment services should operate across the UK and encourage people to make multi-modal journeys by offering a discount to people using a combination of public transport, this should include integrated ticketing for cycle share schemes. Walkability Creating environments which are easy and pleasant for people to walk in encourage people to make to more sustainable transport choices. Bus stops especially in rural areas where they may be the only form of public transport need to be easily accessible by foot, they should be linked up to their surrounding communities, as well as be located near essential local amenities. Cycle Storage Sustrans thinks that every person travelling is entitled to safe cycle storage at all rail and bus stations. Although over the last few years there have been

improvements, there still needs to be an increase in the quality and quantity of cycle storage at stations. Sustrans thinks that principal public transport stations should act as active travel hubs making it easier for commuters, locals and visitors to get active. This should include; • Cycle share schemes linking primary locations across an urban setting. • Secure, weather protected cycle parking, this should be signposted and conveniently located, ideally as close to station entrances as possible. • Cycle repairs and other cycle services. Provision for secure cycle parking should also be provided across all smaller rail and bus stations to help with integrated journeys. For example, a new innovation in the TACTRAN area of Scotland, are providing bike shelters near bus stops so that people in slightly more rural areas can cycle to the bus stop and continue their journey on public transport. Cycles on trains Sustrans recognise that for some journeys, being able to carry a cycle on public transport can make sustainable travel a more viable option. In regard to rail, it is clear that there needs to be an improvement in provision when it comes to adequate space which is easy and convenient to secure cycles on trains. Cycle storage on trains needs to be as flexible as possible. For example, having rolling stock that has flip down seats to accommodate commuters during peak, and prams and cycles off peak. Cycle storage needs to be easy to identify from the platform, and it should be easy to load and unload cycles and other large items. For services where booking a bike space in advance is required, there should be a single, standardised, online system for all operators. Currently, bookings can be done via website (GWR), phone (LNER, East Mids., Virgin), Facebook (CrossCountry), and confirmation can comprise a screenshot of a Facebook message. This would be beneficial for passengers, and also for station staff who can sometimes struggle to book bikes onto trains run by certain operators.

- What is needed is none of these What is needed is a tram/light railway to Lower Penarth and Sully
- We need additional provision for cyclists to and from the Barrage (the Barrage itself works very well). The Penarth Wiggle has been a very good recent addition, as has the widening of the cycle path the other end of the Barrage towards the Port of Cardiff. I cycle to work every day from Penarth to Cardiff and it's a very good route. However, I live close to the Barrage (Clive Place) and can see how coming from further away might be off-putting. Don't forget the Pont y Werin and the route past the Pool and Morrison's to the Taff Trail. Lastly please don't route buses over the Barrage, it would ruin it. Most of what you want can be achieve by - 1. More train carriages 2. Extend the railway back to Cosmeston again (reverse Beeching) 3. 20mph limits 4. More cycle lanes
- My answers need to be qualified by experience of such development elsewhere, hence my only cautious optimism. Not being a transport wallah my view is very subjective. As a Sully resident I would point out that the morning rush-hour queue starts at Sully, just as the kids are going to school. The more that can be done to reduce this traffic (for my granddaughters' sakes) the better. In that context, what about extending the bike-borrowing scheme to Sully and Barry. How will the development of a Dinas Powys bypass influence these proposals? The morning Cog Road rush-hour draws traffic away from Cardiff Road.
- I am writing to ask that you consider including Sully, Dinas Powys and parts of Barry in these options. Limiting the corridor from Penarth to Cardiff does not solve the problems further into The Vale of Glamorgan.
- I am currently researcher for Cardiff Half Marathon. My research is on runnability of streets in Cardiff. The evidence is that for walkers and cyclists and runners this is an important and valued traffic free corridor that has social economic and environmental value for users. The evidence is that people will be put off using these areas for other forms of activity if there is any attempt to add polluting traffic on this route - and this is the case for people who regularly or infrequently use these areas. If you would like to know more about the evidence and value of this route for walkers/runners/cyclist the research will be published later this year
- On option 1 some key routes have been identified but there are a number missing. For example - why are they no routes identified in the area around Stanwell School. Active travel is very important to introduce to the younger generation if we want to encourage it in later life. As a resident nearby I see school kids use both Stanwell Road, Dyserth Road and Archer road to walk and cycle to get to school and yet this area is missing from the map and therefore I presume is not part of the option. By ditching the tourism and leisure non-active travel relevant headland link from this scheme more useful routes like to Schools and the Stanwell road Health Centre could be included. In the very least a larger 20mph limit around the area of the school should be considered. In the main I'd ask those considering these plans to consider 1) Would they ride them and feel safe? 2) Are any of these options really going to encourage existing motorists to ditch the car 3) You just voted for a Climate Emergency. The 'Emergency' part is the important bit. 4) No shared paths. Cyclists and pedestrians hate them equally. 5) A bit of paint is a waste of money - motorists ignore it.

- Please please stop painting murder strip bike lanes on the roads. Please please please stop building wide shared use permissive path pavements like the drivel you have built on Port Road, Barry, the five-mile lane and at Cosmeston. The 'bike strips' you painted on colcot road by colcot arms is the worst example of murder strips for cyclists I have seen. It runs in and out of danger areas and puts bikes right adjacent to rows of parked cars in the door impact zone. Your permissive shared paths in Rhoose by the airport have give way to gates markings on the path. Cyclists should have primacy. Your cycling/pedestrian infrastructure has unsafe joining, crossing and termination points, so it is not safe and not fit for purpose. I cycle 5k to 7k miles every year on VOG roads and they are so terribly designed (always in favour of car drivers) that they are dangerous. Stop designing with motor vehicles in mind and truly embrace active travel. Walking, cycling and last of all public transport should be your priority. The fact your proposal attempts a link with the well-being act is farcical. The fact you propose running buses on one of the only decent pieces of shared active travel infrastructure (the Barrage) illustrates precisely why you should not be allowed to implement any of this mediocre nonsense. You don't improve Active Travel by taking space away from other active travellers, you do it by putting in more bus only lanes and long sections like the exit from Dinas Powys/approach to Mertie Harrier plus segregated cycle lanes and segregated footpaths (not shared) and thereby taking space away from motor vehicles. Whoever is in charge of highways and infrastructure and/ or the officers at VOG just do not understand active travel. WG have said they do not wish to reward mediocrity when giving infrastructure monies to Councils. Why doesn't the VOG put forward a truly exciting and innovative active travel proposal that will obtain funding from government? Come on, it's time you either fully embrace Active Travel or at least employ some consultants who 'get it'.
- Free high quality (similar to Albert Park) water fountains along the Penarth to Barrage route. Coffee hut at Cogan Train Station. Increase cycle parking and better lighting for safety.
- Coffee shop at Cogan to meet the economic aspect of the plan.
- If the old Penarth railway path could be opened up for peak public transport it would probable make a real difference to those who could otherwise use the train. The level of on-street parking around 1/2 mile of Penarth station is very significant on weekdays showing the level of demand for the train for those living more than 20mins walk from the station. The numbers of people walking to the station is very small!. The study needs to consider wider aspects of improving Penarth to Cardiff travel as the lack of stations within the Cardiff area itself is very restricted leaving long journeys on foot having reached Cardiff; East Cardiff is particularly poor in this respect.
- There does not be any evidence in this study that takes into account the Village of SULLY of SWANBRIDGE and LAVERNOCK. The proposed housing development at SULLY and LAVERNOCK of over 1000 houses will surely have a massive effect on this study. THE IDEAL LOCATION FOR A PARK and RIDE is OPPOSITE McDonalds CARDIFF ROAD BARRY. Here there is ample space for Parking. easy access TO ROADS to WENVOE, DINAS POWIS SULLY and PENARTH and a new STATION could be built with links to all areas. THIS WOULD GREATLY REDUCE THE TRAFFIC CONGESTION ON THESE ROUTES. EXTENDING THE RAILWAY FROM PENARTH to LOWER PENARTH, LAVERNOCK and SULLY SHOULD ALSO BE CONSIDERED AS A LONG-TERM PLAN
- How much money was wasted commissioning Capita to produce this absolute twaddle? Surely the money could have been better spent than lining the pockets of expensive consultants with a very poor record on previous Government outsourcing contracts?
- Most of the measures will only work in co-operation with Cardiff Council, Cardiff Bus Transport for Wales and in the case of the barrage Cardiff Harbour Authority. Those people who have chosen to commute by car even when other public transport options are currently available are unlikely to change to public transport because the impact on the time of journey is unlikely to change to the Centre of Cardiff. For those people who have to go to the outskirts of Cardiff the options are not going to make any obvious difference. Improvements to the rail service are going to make the biggest difference particularly with those trains from Penarth where only two carriages are offered as the services are completely overcrowded. The frequency of trains and the speed are the reason most people use them so looking at supporting stations further away from Penarth may encourage more people to use the train. The Vale of Glamorgan LDP which has supported the increase in existing settlements without supporting public transport to a suitable degree has had an adverse effect on car use (e.g. the extension of Penarth towards Sully/Cog Road where there is no nearby rail link).
- You need to be more forward-thinking designing transport improvements that will show real improvements over the next 20 years not 12 months. Buses are not the answer as they cost your highway asset teams massively in maintenance due to the damage they cause while still being subject to the same traffic delays. Unless you remove

roads from use by private vehicles you will always fail to make any real improvements. A light railway network would be a long-term improvement.

- To supplement the Cogan multi-modal interchange sustainable Transport interchange option, it is suggested that 'Dock Road' between Paget Terrace and The Custom House be close to traffic, except public service buses, cycles, council service vehicles and emergency services vehicles.
- NRW is supportive of all measures which could result in a modal shift away from car use to encourage decarbonization and the benefits of active travel to a healthy lifestyle. These proposals should also include opportunities for enhancing electric vehicle charging
- NRW would like to see all opportunities for maximizing green infrastructure including urban trees, sustainable drainage, green verges/islands, green roof/walls taken in order to enhance biodiversity in line with Environment Act and Wellbeing and Future Generation Act statutory duties. This may require a shift of mind from "standard engineering" approaches and early engagement in the design is critical.
- Both the Headland link and Cosmeston schemes involve activities that could impact on the unique features of those natural areas. Whilst there are statutory mechanisms to provide protection, these should not be viewed as minimum standards to be met as the residents and visitors to Vale of Glamorgan indicate regularly how much they value their natural environment

Appendix D – Penarth Headland Link Group Letter

Penarth Headland Link

Connecting the Capital to the Coast

Registered Charity No 1167209 – a charitable not-for-profit company

From the Chair of the Trustees : Roger Thomas OBE OStJ

Mr Rob Thomas
The Managing Director
Vale of Glamorgan Council

2nd August 2019

Dear Mr Thomas

Penarth/Cardiff Barrage Sustainable Transport Corridor Study WelTAG 2 Consultation

I know that you understand and appreciate the range of expertise on relevant issues that is represented on our Board of Trustees and the voluntary commitment that we have provided collectively to the Vale of Glamorgan Council over several years in pursuance of the objectives that your Council seeks to achieve in respect of sustainable transport links.

We therefore wish to make a specific contribution to your current WelTAG2 Consultation in an open and authoritative form which goes beyond answering the short questions posed in the questionnaire on your website.

Of the three options on which the Council has consulted in the current exercise, the first option – **Active Travel proposals for the Penarth Cardiff Barrage Corridor** – is the one that we consider the most attractive and achievable option of the three. It is also the one that has garnered the greatest general support in Penarth and elsewhere. The work we have undertaken to date - with which you are familiar – provides the basis for delivering significantly on the aspirations reflected in this option, and for that reason this submission considers and supports the practicalities of proceeding with Option One.

Within Option One there are positive proposals for improving the safety and attractiveness of Active Travel on the roads of Penarth, **but the only major and transformative proposal is Link K, namely the "Construction of a rock-fill causeway between Penarth Esplanade and the Western end of the Cardiff Bay Barrage to provide a shared pedestrian and cycle link".** Our work has shown beyond doubt that the project is practical, achievable, and low cost, as well as simple to construct and transformative in its impact.

The fact that the Link will be transformative in its impact has long been accepted. It was a key feature in an exhibition on the future of Penarth in 1992 organised by the local MP and supported by all three local authorities.

PERSONAL DETAILS REDACTED FOR THIS REPORT.

The Cardiff Bay Barrage Act 1993 deliberately included the line of the link and gave it planning permission to facilitate its construction and the potential benefits to active travel in Penarth and the wider Vale of Glamorgan are clearly enormous.

It is also worth pointing out that the full value of the Barrage cannot be realised unless and until the Penarth Headland Link is constructed – because the Barrage lacks a destination and the Penarth Headland itself is as great a disincentive to local Active Travel as it is to visitors and tourists. Indeed we note that your document refers to the challenges of the local topography and the causeway will in effect change the topography.

Long-distance paths make a significant contribution to the local economy but in South Wales that potential benefit is not being realised because there is no starting point in the Capital for the Wales Coast Path. The current convoluted path through streets and lanes on the Headland doesn't work and the Headland itself acts as a massive disincentive to commuters and visitors alike.

As soon as the Penarth Headland Link is built, the geography changes dramatically.

- It opens up a safe and attractive route between the Vale of Glamorgan (including Barry, Sully and most of Penarth) and Cardiff.
- It will significantly increase the number of people who can confidently choose cycling and walking as their route to work in Cardiff.
- The same applies in the opposite direction, with a route into Penarth through Alexandra Park or along the cliffs towards Sully and Barry being simple, safe and attractive.

The construction of the Causeway will lead to enormous social and economic benefits which will extend well beyond Penarth and the Vale of Glamorgan.

It will…….

- provide pedestrian and cycling access between Penarth and Cardiff Bay,
- open up access to the wider Vale,
- link the Vale to the Taff Trail and wider networks
- provide the "missing link" at the very start of the Wales Coast Path between the Capital City and the Vale of Glamorgan,
- generally to remove a series of obstacles to sustainable travel.

While the requirements for consultation are very narrow, it would be remiss of us not to provide this wider context and explanation of the benefits that will accrue to the Vale of Glamorgan and South Wales more generally when the Causeway is constructed. We are concerned about the time it is taking to complete all the processes necessary to seize the opportunity that has been presented to the Council. A year has been consumed by the process on a project which is a massively significant development for the Vale Council and its citizens and also for the citizens and Council of Cardiff.

PERSONAL DETAILS REDACTED FOR THIS REPORT.

Before turning to the specific criteria we would make the following observations…….

Sustainable transport issues

There is no doubt that the construction of the Causeway would provide a significant contribution to sustainable transport in the area. People from the wider Vale of Glamorgan, particularly Lavernock, Sully and the town of Barry, would be able to travel into Cardiff by walking or cycling in a way that is currently constrained by the lack of a suitable route. Similarly people from Cardiff would be able to travel to work in the Vale of Glamorgan by cycling or walking.

This would be open to visitors and tourists more generally as currently the Cardiff Bay Barrage "lacks a destination" which leads many visitors to stop at the playpark or at the locks and fish pass and those who go any further are quickly intimidated by the scale of the climb up Penarth Head, not to mention the confusion for those who go any further and find there is no clear route beyond.

The Causeway would take the visitor naturally to Penarth Pier and Esplanade and an attractive walk through Alexandra Park to the attractions of the town centre. Parking is a significant problem within the town of Penarth but there is a vibrant local economy with many coffee shops and restaurants, so arriving in the town by cycle or on foot will have attractions to people who are familiar with the town.

Opportunities

The building of the Causeway is likely to lead to a return of the Cardiff Marathon which in turn will publicise the viability of sustainable travel between Cardiff and Penarth. That would signal a paradigm shift in the opportunities in the area and might well lead to increased use of other facilities – for example Pont y Werin - for which usage remains low. We are convinced by all the evidence that the creation of the Causeway must be the first priority as that will demonstrate the viability and benefits of easy travel between the Barrage and the Esplanade.

Problems

We can see no insurmountable challenges to the construction of the Causeway. The Council has full details of the work we have undertaken to develop a practical model within realistic finances. That work dealt with issues such as positioning the Causeway to obviate the risk from the cliff face, management of the Causeway itself, and designing the Causeway at a height which would involve overtopping and closure on a minimum number of occasions each year. **There seem to have been some misapprehensions on this score in recent months about the cost if the Causeway were built at a height to avoid over-topping at any time, whereas that is not necessary and the extra cost cannot be justified.**

PERSONAL DETAILS REDACTED FOR THIS REPORT.

Constraints

While there are a number of practical constraints, the Causeway as we have designed it provides the most practical solution to those constraints. The width will allow for both pedestrians and cyclists to make the best use of the Causeway in both directions and fits with practical experience in other parts of the world, particularly Vancouver and in New Zealand.

We note the contribution that can be guaranteed once the Causeway is built and which in terms of the specific focuses to which the consultation refers can be summarised as follows ……..

Increase the use of public transport

There is no doubt that the construction of the Penarth Headland Link would encourage circular routes, making use of train connections out of Cardiff to stations such as Penarth and Cogan whereas current options are perceived as linear and make it more likely that people will use their own vehicle. Development of plans and route ways and promotion of the area as friendly to the use of public transport would be greatly enhanced by the construction of the Causeway

Encourage modal shift away from use of the private cars

The Causeway would significantly change the dynamics and perception of travel opportunities in the area of Cardiff Bay and Penarth. At the moment the Barrage itself lacks a destination and is perceived as linear. The creation of the Causeway would change that perception and offer a variety of circular routes, changing the linear perception that encourages car use. There is already a cycle rental scheme which is currently suboptimal in terms of its appeal in the Cardiff Bay area despite the clear public appetite - the route is simply too limited at present

Reduce road traffic congestion and support increased economic activity

The Causeway would provide significant opportunities for people who currently commute by car from Penarth, Lavernock, Sully and Barry to avoid the morning gridlock and to travel on foot or by cycle and to return in the same way. Travelling one way by train and returning on foot or by cycle becomes a practical option once the Causeway is in place. Encouraging and enhancing these options fits with the policies of the Vale of Glamorgan Council and indeed the policies of Cardiff Council in ways that are complementary

Increase both accessibility and connectivity

The Causeway would make access to Penarth Esplanade from Cardiff and to Cardiff from locations like Lavernock, Sully and Barry far more practical and attractive.

PERSONAL DETAILS REDACTED FOR THIS REPORT.

Given the importance of the Wales Coast Path, which is currently not visible nor practical for a start from the Capital City, the increase in accessibility and connectivity is potentially enormous

Increase levels of active travel & associated health benefits

As has already been made clear the Causeway has enormous potential for increasing levels of active travel and therefore contributing to associated health benefits. However the benefits go much wider than this. The Causeway has already been highlighted as offering the potential for people in poor health to be able to enjoy a coastal opportunity, for example using wheelchairs in an environment that is attractive for small children and teenagers as well as for serious walkers and cyclists.

Create infrastructure which supports tourism investment

The Causeway has enormous potential for expanding the level of tourism and therefore tourism investment in the South Wales area. Cardiff Bay is a success story in terms of transforming the image of Cardiff worldwide, with the focus on the area during the UEFA Championship Cup Final, during the NATO Summit, and during the Volvo Round the World Race events being superb examples of the potential. However it was very obvious during each of these events that the project was incomplete. The area defined in the Cardiff Bay Barrage Act deliberately continued around the Penarth Headland as far as the Penarth Pier for the very reason that the Causeway was vital to completing the project. Without the Causeway the full investment in the Barrage by Government cannot be realised and yet it is still counted as a success. The addition of the Causeway to what already exists will make an enormous contribution to tourism investment in the region as a whole in a way that cannot simply be defined within the limits of the footprint of the Causeway.

Further evidence of support and context

The considerable public interest in and support for the Headland Link project is shown by the value – over £250,000 – of the pro-bono contributions from professionals and academics and trustees with appropriate expertise to our work of scoping out its technical aspects and economic benefits. At a well-attended public meeting at the Pier Pavilion in November 2015 almost everyone was strongly in favour of the Causeway.

The Headland Link is in line with Welsh Government policies under the **Well-being of Future Generations (Wales) Act 2015** and the **Active Travel (Wales) Act 2013** and would complement the current and announced future arrangements for the use of bike sharing under the NextBike scheme. We see the Welsh Government's substantial grants to the Vale of Glamorgan Council to take the project through the WelTAG process as recognition of a public wish to see the Causeway project proceed.

PERSONAL DETAILS REDACTED FOR THIS REPORT.

The Penarth Town Place Plan (Autumn 2014) records that ''a connection around the headland, between the Barrage and the Esplanade was regularly mentioned through consultation in order to enhance connectivity for Penarth, particularly as an economic and tourism benefit for the town'' and ''… consultation has demonstrated a clear public appetite for a connection''.

Cost effectiveness

We have concentrated on the specific benefits of the project on the issues that will be considered within the WelTAG process but built into the approach of Welsh Government in recent years has been the understanding that benefits for the public are often not isolated in silos of policy or expenditure, with all participants in the Public Services Board for each area being asked to contribute to the good of the whole including social economic and environmental benefits. The promotion of the Foundational Economy has further encouraged a joined-up approach and maximum local impact. That fits well with the spirit of the Arup report in November 2016 which provided an "Outline Economic Impact Assessment" of the Penarth Headland Link.

Significant benefits from the PHL could come from increased tourist visitor numbers to Penarth and their associated expenditure in and around Penarth Pier. With the improvement in accessibility brought by a new safe and scenic route, a greater proportion of the visitors to Cardiff Bay would likely be attracted to cross the barrage to Penarth. And with Penarth brought within a comfortable and scenic walk or cycle from the barrage, it might be expected that more tourists would spend more time in the greater Cardiff Bay area as a whole.

It concludes that a 16-fold return on investment would benefit the public purse. This reinforces our view that there is powerful synergy between the Active Travel benefits of the Link and the predicted economic and social benefits. As the report states…….

A baseline estimate for the effect of the opening of the Penarth Headland Link might be for a permanent 3 per cent uplift in tourism expenditure in the Greater Cardiff Bay area. Assuming a scheme opening of 2020, this would give a present value of benefits of approximately £160m over a 30-year appraisal period. Even a low impact scenario of a permanent 1 per cent increase from the opening of the link would still bring a present value of benefits over 30 years of £54 million.

The document reaches some powerful conclusions : *This paper concludes that the PHL has the potential to bring substantial economic benefits both to Cardiff and to Penarth and gives an overview of what these might be. It shows qualitatively that……*

- *The expected increase in tourist expenditure from the arrival of the Penarth Headland Link would more than cover its costs in the long term. An enhanced retail offering at both ends would maximise these benefits.*

PERSONAL DETAILS REDACTED FOR THIS REPORT.

- *Increased cycling activity will come from providing Penarth commuters with a shorter safer route to the Bay, with substantial health benefits.*
- *Increased pedestrian and cycling leisure activity around the Cardiff Bay would occur by providing access to the Taff Trail and the Wales Coastal Path with a spectacular, easy to use link.*
- *Induced cycle and walking trips can be enhanced by supporting interventions such as Cardiff's incoming cycle hire scheme to Penarth and a tourist train.*

The report concludes that while the potential economic benefits are large, these are difficult to monetise using a **conventional** transport appraisal framework. That suggests that there is value in our approach.

Conclusion

It is clear that the benefits of the Penarth Headland Link go way beyond the specific measures on which the WelTAG process has to focus, but we believe that we have been able to argue convincingly that it meets **all** those criteria too. Indeed one of the frustrations for the Board of Trustees is the length of time it is taking to get through the processes to reach the stage of delivery on a project that many individuals within levels of Government as well as in business and the professions regard as – and repeatedly refer to as – a "no brainer". That has been the response each time we opened up our proposals to public debate and as one person commented recently "we can all see the value of the project – why doesn't the Council just get on and do it?" Of course, we appreciate that the formal processes are in place to provide safeguards for the public and for local government, and that the formal requirements have to be met, and we stand ready to work closely with the Council and its officers in the hope that together we can accelerate the work over the coming weeks and months

A copy of this letter goes with our formal response to your consultation questionnaire but we also hope that its contents will be considered fully in considering the way forward for delivering the project. Copies also go to the Leader, Councillor Neil Moore, and the most relevant Cabinet Member, Councillor Peter King.

Yours sincerely

Roger G Thomas

PERSONAL DETAILS REDACTED FOR THIS REPORT.

Appendix E - Our Future Community Letter

Thursday 8th of August 2019

Dear Ms Reed

Formed in mid-2019 and open to all residents of Sully & Lavernock, "Our Future Community" is a growing group of residents who are working to strengthen our community. Our approach is underpinned by a commitment to the objectives of Place Planning and Community Planning and, through these, the Planning (Wales) Act 2015 and the Well-being of Future Generations (Wales) Act 2015.

We are writing to you as Vale of Glamorgan Council's Head of Neighbourhood Services & Transport and to share our feedback and real concerns with aspects of the Penarth Cardiff Barrage Sustainable Transport Corridor Study which is now at Stage Two of the WelTAG assessment process.

BOUNDARIES

Residents of Sully & Lavernock see our community neglected by both local and Welsh Government which, consequently fail to address major transport concerns/issues affecting the area. Much to our dismay, we have noticed that current plans for the Transport Corridor do not extend significantly beyond the boundaries of Penarth, even though a sizeable proportion of the traffic issues of concern derive from car commuters either passing through or originating within Sully & Lavernock. This situation will be exacerbated by the two very large projected housing developments at Cog and Upper Cosmeston Farm. **We are therefore very concerned that current transport planning neither acknowledges the existing challenges within Sully & Lavernock nor any projections for future population and traffic growth within our community.**

CONSULTATION

We are supportive of *Option 1 - Active Travel proposals for the Penarth Cardiff Barrage Corridor* - which we see as positive for Penarth and neighbouring communities. **However, we strongly contend the Corridor should be extended to include Sully & Lavernock, with associated commitments in active travel similar to those envisaged for Penarth.** This should include safe active travel corridors, 20mph speed limits on all community roads and the introduction of electric Nextbikes. The latter would enable electric-powered journey times of some 12 minutes from the centre of Sully to the centre of Penarth and its railway station.

We do not support *Option 2: Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage*. This proposal would be likely to increase traffic flows through Sully at peak times as commuters, primarily from Barry, travel to the car park. In addition, the bus route to the Barrage is likely to be adversely affected by traffic congestion within Penarth and be unlikely to tempt commuters from their cars. It is also clear that the continuation of the bus route across Cardiff Barrage would adversely impact many of its qualities, for example as a facility for leisure, play, healthy activities, relaxation and active travel. Inevitably, there would also be similar negative impacts on Cosmeston Park which should be protected as a precious green space given the scale of housing and other development envisaged in the area by Vale of Glamorgan Council and Welsh Government.

Option 3: Cogan Multi-Modal Sustainable Transport Interchange would at first glance only seem to compound the existing problems by concentrating vehicular traffic at the

most congested part of the network. Without the benefit of further details of the proposal, it seems to offer little improvement for residents of Sully & Lavernock.

TRAFFIC GROWTH

Our community's travel activities add significantly to the congestion being experienced in Penarth. At the same time, our principal village road and village community are adversely impacted by vehicle movements between Barry, Penarth and Cardiff.

The approach to the Penarth/Cardiff Barrage Sustainable Transport Corridor consultation fails to recognise the relevance of the permitted and proposed housing developments to the Corridor as currently defined. Based on current patterns, it is likely that the bulk of vehicle traffic from the Cog and Upper Cosmeston Farm developments will travel in the direction of Penarth. Together, the two schemes propose 1,116 households. Using the average household size in the Vale of Glamorgan of 2.28 persons, this amounts to a conservative estimate of an additional 2,544 people. Based on a conservative estimate of 1.5 cars per household in Sully, this suggests that **the Cog and Upper Cosmeston Farm schemes will result in some 1,700 additional motor vehicles using the existing congested road network.**

MODAL SHIFT

We are concerned by the scale of housing development envisaged for Sully & Lavernock at Cog and on Welsh Government land at Upper Cosmeston Farm. In the absence of ready-access to a rail station, these developments will primarily be car-based schemes. Both proposed developments are in the Sully & Lavernock community council area, which currently contains around 5,500 residents. Taken together the new developments, **this would result in a population of over 8,000 people.** Based on findings elsewhere, the socio-demographic for these developments will have an extremely low propensity for bus travel. Alternative solutions are required and we favour a combination of investment in active transport and the reintroduction of rail services to Lavernock/Cosmeston and onward to Sully.

In the case of Upper Cosmeston Farm, we note that Welsh Government are the landowners and promoters of its development. For Welsh Government to be progressing such a large scheme and generating significant returns whilst not addressing a fundamental lack of rail transport infrastructure to mitigate its severe impact on the area demonstrates particularly poor judgement and a clear lack of joined-up thinking when higher standards should be expected, particularly following implementation of the Future Generations (Wales) Act 2015 and the establishment of Transport for Wales.

Sully & Lavernock is already the largest Vale of Glamorgan community without a rail station. For comparison, Dinas Powys has two stations serving a population of around 7,500. Using this as a benchmark, it does not seem unreasonable that **the existing rail service to Penarth should be extended along its former route to Sully, with at least one additional stop at Cosmeston and/or Lower Penarth**.

We have been advised by Transport for Wales that an initial study into the potential for reintroducing rail services to Sully would cost in the order of £50,000 to £100,000. When compared with the costs of other options being considered under the Transport Corridor Study and the scale of housing development envisaged at Cog and Upper Cosmeston Farm, this is a relatively small amount of money. **We believe that all transport infrastructure options should be properly weighed in advance of any large-scale property development**. This has clearly not happened and

considering the scale of housing development envisaged for Sully & Lavernock, this causes us considerable concern.

CONCLUSION

We believe that the Sustainable Transport Corridor Study offers a unique opportunity to shape the nature of transport between Sully, Penarth and Cardiff, and to enable the desired modal shift, but that the exclusion of Sully as an integral part of the study is both ill-judged and short-sighted.

We would welcome the opportunity to discuss our concerns in person with you.

Yours sincerely

Kaarina Ruta

On behalf of Our Future Community

Appendix F – NRW Questionnaire Response

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Penarth Cardiff Barrage Sustainable Transport Corridor Study

WelTAG Stage Two: Public Consultation

Thank you for taking the time to review the three proposed options. We would be grateful if you could complete the questions below to help us gain an understanding of your opinions of the options.

The responses received will be incorporated into the WelTAG Stage Two report and help to determine the focus of the study going forwards.

1. Please can you give us your opinion on each option. **Please tick ONE rating for each option.**

I would like to see...	Option	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
	1. Active Travel proposals for the Penarth Cardiff Barrage Corridor		x			
	2. Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage		x			
	3. Cogan Multi-Modal Sustainable Transport Interchange		x			

2. Are there any aspects of the proposed options that you particularly like, or dislike?
Please comment and continue on the section marked 'additional comments' if you wish.

Option	I LIKE these parts of the proposal...	I DO NOT like these parts of the proposal...
1. Active Travel proposals for the Penarth Cardiff Barrage Corridor	Development of 20mph zones should provide the opportunity to build in green infrastructure for traffic calming measures etc to support AQ improvements and enhance biodiversity; Opportunity for residents and visitors to increase healthy active travel	Concerns that development of the headland will not adequately protect the unique features of the Special Area of Conservation (Severn Estuary)
2. Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage	Increasing bus travel should reduce car travel (decarbonization); Opportunity to maximize sustainable bus travel (e.g. electric) to reduce AQ impacts; Also, opportunities for green infrastructure along the routes (e.g. green roof on bustops)	Concerns that development of a P&R will not adequately protect the features of the country park; Concerns that design and development of the interchange will not maximize opportunities for green infrastructure/sustainable drainage No mention of opportunities for electric vehicle charging

3. Cogan Multi-Modal Sustainable Transport Interchange	Opportunities for green infrastructure to be built into the design of the interchange and along the routes to reduce AQ impacts	Concerns that design and development of the interchange will not maximize opportunities for green infrastructure/sustainable drainage

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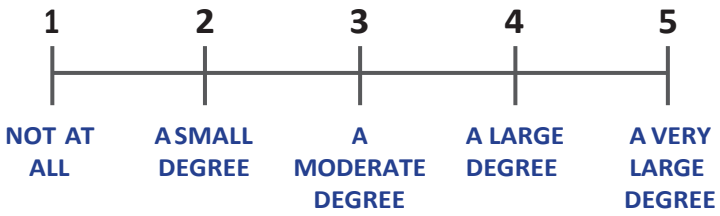
3. To what extent do you believe the proposed options will be successful in achieving the following objectives? Please mark a number between 1 and 5 in the boxes provided, using the following scale:



		Options		
		1. Active Travel proposals for the Penarth Cardiff Barrage Corridor	**2. Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage**	**3. Cogan Multi-Modal Sustainable Transport Interchange**
Objectives	Reduce reliance upon the private car & encourage more sustainable modes	2	3	4
	Reduce barriers that constrain opportunities to use sustainable modes of transport	2	3	3
	Increase sustainable transport options to improve accessibility along the study corridor	3	3	3
	Deliver sustainable transport improvements that encourage increased economic activity and support long-term investment	2	2	2
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment	2	2	2

4. Additional Comments

NRW is supportive of all measures which could result in a modal shift away from car use to encourage decarbonization and the benefits of active travel to a healthy lifestyle. These proposals should also include opportunities for enhancing electric vehicle charging

NRW would like to see all opportunities for maximizing green infrastructure including urban trees, sustainable drainage, green verges/islands, green roof/walls taken in order to enhance biodiversity in line with Environment Act and Wellbeing and Future Generation Act statutory duties. This may require a shift of mind from "standard engineering" approaches and early engagement in the design is critical.

Both the Headland link and Cosmeston schemes involve activities that could impact on the unique features of those natural areas. Whilst there are statutory mechanisms to provide protection, these should not be viewed as minimum standards to be met as the residents and visitors to Vale of Glamorgan indicate regularly how much they value their natural environment.

Thank you.

We | Listen Create Deliver

www.capita.co.uk/infrastructure

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Appendix 18 WelTAG Stage Two Option Appraisal Tables

Worksheets 1 – 4b from WelTAG Stage 1 are included within this Appendix for reference, these refer to a previous option which has not been appraised at WelTAG Stage Two.

Worksheet 1: Problems and Issues

Well-being Goal being hindered	Ref	Description	Evidence
A Prosperous Wales	1	Existing volumes of traffic and levels of congestion causes pollution and creates unreliable journey times and delays to private and business vehicles and bus services, particularly during peak periods. A study by Arup (2018) has highlighted that traffic congestion and delay is a significant issue along the B4267 Lavernock Road/ Redlands Road (between Cosmeston and Cogan), along the A4160 Windsor Road (between Penarth and Cogan) and on the A4055 around the Merrie Harrier junction. This is particularly the case during the AM peak when with average speeds are often 10mph or lower. The WelTAG consultation highlighted congestion problems on routes between Penarth and Cardiff, e.g. along Windsor Road, Windsor Road/ Plassey Street and in Penarth town centre. Reference was also made to congestion at Penarth Marina due to 'rat-running'.	▫Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0) ▫Arup (Oct 2018); and ▫WelTAG consultation events (Jan 2019)
	4	Sustainable transport options available do not present an attractive alternative to car travel e.g. key destinations are not easily accessible by sustainable transport modes, bus accessibility and provision is viewed as poor, rail service viewed as unreliable, expensive and requiring more capacity, lack of reliable boat service throughout the year.	▫WelTAG consultation events (Jan 2019)
	6	A lack of park and ride facilities in the area limits the opportunities for interchange between car and public transport, which reduces the attractiveness of public transport travel options. Park and ride provision at rail stations in the study area (Penarth, Dingle Road and Cogan) is very limited with less than 25 parking spaces available at both Penarth and Cogan and no parking available at Dingle Road. There are no bus park and ride facilities available in the study area.	▫Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0); ▫Arup (Oct 2018); and ▫WelTAG consultation events (Jan
 A Resilient Wales	3	High levels of car use and low levels of public transport usage and active travel, particularly for commuting journeys. The close proximity of Penarth to Cardiff results in high levels of commuting into Cardiff. Figures for the Vale of Glamorgan as a whole show that 52.2% of working residents commute out of the county borough to work with the majority of these (21,600) commuting to Cardiff. A study by Arup (2018) has highlighted that a significant proportion of those working in Cardiff commute to work by private car (66.7%) and only 12.5% commute by public transport (bus and rail). There are high levels of commuting by car transport into Cardiff due to a lack of convenient and attractive alternatives by sustainable modes and this puts pressure on the local highway network and routes into Cardiff.	▫StatsWales Commuting Patterns in Wales 2017; ▫Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0); and ▫Arup (Oct 2018).
 A More Equal Wales	5	Bus services linking Penarth and Cardiff have slow journey times and are unreliable due to congestion problems along the bus corridors. The available bus route options often require interchange at Cardiff Bay. A study by Arup (2018) has found that bus services take between 50% and 80% longer than travelling by car, with congestion problems in Cardiff being a key factor in the length of journey times. The significantly longer journey times reduce the attractiveness of bus travel, particularly for those commuting into Cardiff.	▫WelTAG consultation events (Jan 2019); ▫Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0); and ▫Arup (Oct 2018).
 A Healthier Wales	7	There are currently low levels of active travel for everyday journeys, which needs to be increased if the long term health benefits of active travel are to be realised. The WelTAG consultation noted that too many short distance trips are undertaken by car. A study by Arup (2018) found that 12.6% of Penarth residents walk to work and 3.7% commute by bike. Both figures are higher than the Wales average but have potential to be increased further due to the proximity of Penarth to Cardiff and the high levels of commuting into Cardiff.	▫WelTAG consultation events (Jan 2019); ▫Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0); and ▫Arup (Oct 2018).
	11	Environmental factors reduce the attractiveness of walking and cycling e.g. the exposed nature of the most direct active travel route into Cardiff (across Cardiff Barrage) may discourage use of the route during bad weather, coastal erosion, risk of rockfall and bad weather conditions (storms/ high tides) along the coastline.	▫WelTAG consultation events (Jan 2019)
	8	Safety issues act as a barrier to walking and cycling and the constrained nature of the built environment e.g. narrow roads and congestion at junctions, creates conflicts between motor vehicles, pedestrians and cyclists. Specific locations highlighted during the WelTAG consultation include: - lack of safe cycle routes along Windsor Road and Penarth Road; - Arcot Street/ Windsor Road junction being dangerous for cyclists; - footways in Penarth being dangerous for those with disabilities; - the need for safe pedestrian crossing facilities at Plassey Street/ Windsor Road; - a lack of safe pedestrian crossing facilities at Cogan (Windsor Road/ A4160 adjacent to railway station); and - the hill from Cardiff Barrage into Penarth being dangerous for cyclists and the footway being unsuitable for pedestrians.	▫WelTAG consultation events (Jan 2019)

Worksheet 1: Problems and Issues

Well-being Goal being hindered	Ref	Description	Evidence
A Wales of Cohesive Communities	9	A lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes within Penarth and between Penarth and Cardiff creates a poor quality environment for walking and cycling and acts as a barrier to encouraging active travel. Specific issues highlighted during the WelTAG consultation include: - the existing route connecting Penarth seafront to Cardiff Barrage being challenging and unsuitable for pedestrians and those with mobility problems; - need a link to Cardiff Bay that avoids busy junctions; - need to improve pedestrian and cycling access to Cogan and Penarth stations; - no route from Cardiff Barrage to bottom of 'zig-zag' path; - poor connectivity from Llandough Hospital and Merrie Harrier to Penarth; and - lack of lighting along existing active travel routes.	▫WelTAG consultation events (Jan 2019); ▫Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0); and ▫Arup (Oct 2018)
	10	A lack of facilities for cyclists at trip origin and destination discourages the use of active travel e.g. no current opportunities to hire bikes, lack of showers and bike storage at employment sites.	▫WelTAG consultation events (Jan 2019)
	12	The topography of the area acts as a barrier to active travel and creates difficulties in providing active travel infrastructure e.g. gradient from Cardiff Barrage to Penarth town centre.	▫WelTAG consultation events (Jan 2019)
 A Wales of Vibrant Culture and Thriving Welsh Language	14	Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the Penarth economy e.g. there is a need for improved links to Cardiff Bay and the Penarth end of Cardiff Barrage lacks a 'destination'. The operational barrage also impacts on connectivity and creates conflict between pedestrians and cyclists using Cardiff Barrage and Pont y Werin.	▫WelTAG consultation events (Jan 2019)
 A Globally Responsible Wales	2	The high volume of traffic acts as a barrier to walking and cycling and to increasing levels of active travel. The WelTAG consultation highlighted the volume of traffic on Windsor Road and Hickman Road as being a barrier to walking and cycling, along with the speed of traffic along Windsor Road.	▫WelTAG consultation events (Jan 2019)
	13	Road traffic emissions and congestion contribute to reduced air quality in some areas and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	▫Vale of Glamorgan Council 2018 Air Quality Annual Progress Report (Aug 2018)

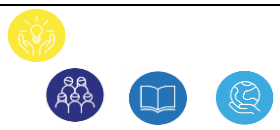
Worksheet 2: Objective Development - Long List of Objectives

Objective	Measurability of Objective	Evidenced Problem Objective Potentially Addresses (Refer to Worksheet 1)	Well-being Goals being progressed
To increase the use of public transport	• Bus and rail operator data	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; and • Lack of park and ride facilities limits opportunities for public transport interchange.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Globally Responsible
To encourage a modal shift away from the private car towards public transport and active travel, particularly for short journeys	• Office for National Statistics data, • Bus and rail operator data, • Active travel route counts/data.	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; • Lack of park and ride facilities limits opportunities for public transport interchange; • Low levels of active travel; • Safety issues act as a barrier to walking and cycling; • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; • Lack of facilities for cyclists at trip origin and destination; and • Environmental factors reduce the attractiveness of walking and cycling.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible
To reduce journey times and improve journey quality for sustainable transport modes	• Bus operator data, • Bus journey time data	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; and • Lack of park and ride facilities limits opportunities for public transport interchange.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Globally Responsible
To reduce car usage	• Office for National Statistics data	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • High levels of car use and low levels of public transport use; and • Road traffic emissions and congestion contribute to reduced air quality in some areas and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	 Prosperous, More Equal, Healthier, Cohesive Communities, Globally Responsible
To reduce road traffic congestion	• Traffic survey data, • Bus journey time data	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • Unreliable and slow journey times of bus services; • High levels of car use and low levels of public transport use; and • Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	 Prosperous, More Equal, Healthier, Cohesive Communities, Globally Responsible
To reduce the number of vehicles	• Traffic survey data	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Volume of traffic is a barrier to walking and cycling; • Unreliable and slow journey times of bus services; • High levels of car use and low levels of public transport use; and • Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	 Prosperous, Resilient, More Equal, Healthier, Globally Responsible
To support increased economic activity	• Office for National Statistics data	• Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy; and • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution.	 Prosperous, More Equal, Cohesive Communities, Vibrant Culture, Globally Responsible
To improve accessibility	• Traffic/transport survey data, • Local Authority data, • Footfall data	• High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Low levels of active travel; • Safety issues act as a barrier to walking and cycling; and • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Globally Responsible

Worksheet 2: Objective Development - Long List of Objectives

To improve access to employment	• Traffic/transport survey data, • Local Authority data	• Lack of facilities for cyclists at trip origin and destination; and • Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, More Equal, Cohesive Communities, Vibrant Culture, Globally Responsible
To improve connectivity	• Bus and rail operator data - services, routes • Passenger/footfall counts	• Lack of park and ride facilities limits opportunities for public transport interchange; and • Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, More Equal, Cohesive Communities, Vibrant Culture, Globally Responsible
To improve connectivity between buses and trains	• Bus and rail operator data	• High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Lack of park and ride facilities limits opportunities for public transport interchange; and • Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, More Equal, Cohesive Communities, Vibrant Culture, Globally Responsible
To improve sustainable connectivity between Penarth and Cardiff	• Bus and rail operator data, • Active travel counts	• High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Low levels of active travel; • Safety issues act as a barrier to walking and cycling; and • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible
To increase levels of active travel	• Active travel counts/data on routes	• Sustainable transport options not an attractive alternative to car travel; • Low levels of active travel; • Safety issues act as a barrier to walking and cycling; • Lack of facilities for cyclists at trip origin and destination; and • Topography of the area acts as a barrier to walking and cycling	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Globally Responsible
To reduce barriers to active travel in support of associated health benefits	• Active travel counts/data on routes, • Footfall counts	• Volume of traffic is a barrier to walking and cycling; • Sustainable transport options not an attractive alternative to car travel; • Low levels of active travel; • Safety issues act as a barrier to walking and cycling; • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; • Lack of facilities for cyclists at trip origin and destination; • Environmental factors reduce attractiveness of walking and cycling; and • Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible
To improve the overall health and wellbeing of residents	• Air quality monitoring data	• Low levels of active travel; • Environmental factors reduce the attractiveness of walking and cycling; and • Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible
To ensure infrastructure created supports sustainable investment	• Office for National Statistics data	• Sustainable transport options not an attractive alternative to car travel; • Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy; and • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution.	 Prosperous, Resilient, More Equal, Cohesive Communities, Vibrant Culture, Globally Responsible
To improve infrastructure for sustainable modes of transport	• Bus and rail operator data, • Local Authority data	• High levels of car use and low levels of public transport use; • Sustainable transport options not an attractive alternative to car travel; • Unreliable and slow journey times of bus services; • Lack of park and ride facilities limits opportunities for public transport interchange; • Low levels of active travel; • Safety issues act as a barrier to walking and cycling; and • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible

Worksheet 2: Objective Development - Long List of Objectives

To increase tourism	• Office for National Statistics data • Footfall data • Visitor attraction figures	• Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, Cohesive Communities, Vibrant Culture, Globally Responsible
To enhance Penarth's economy by increasing visitor numbers	• Office for National Statistics data • Bus and rail operator data	• Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy; • Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; and • Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes.	 Prosperous, More Equal, Cohesive Communities, Vibrant Culture, Globally Responsible
To become environmentally 'cleaner and greener'	• Air quality monitoring data	• Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; • Environmental factors reduce the attractiveness of walking and cycling; and • Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	 Prosperous, Resilient, Healthier, Cohesive Communities, Globally Responsible
To improve air quality, especially around Cogan	• Air quality monitoring data	• Environmental factors reduce the attractiveness of walking and cycling; and • Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Globally Responsible

Worksheet 3: Objective Development - Short-List of Objectives

Ref	Statement/Objective	Comments and relationship to Problems and Issues (Worksheet 1)	Well-being Goals being progressed	Ways of Working					Comments
				Collaboration	Integration	Involvement	Long Term	Prevention	
1	Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel	1. Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; 2. Volume of traffic is a barrier to walking and cycling; 3. High levels of car use and low levels of public transport use; 4. Sustainable transport options not an attractive alternative to car travel; 5. Unreliable and slow journey times of bus services; 6. Lack of park and ride facilities limits opportunities for public transport interchange; 7. Low levels of active travel; 8. Safety issues act as a barrier to walking and cycling; 9. Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; 10. Lack of facilities for cyclists at trip origin and destination; 11. Environmental factors reduce the attractiveness of walking and cycling; 12. Topography of the area acts as a barrier to walking and cycling; 13. Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth; and 14. Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible	✓	✓	✓	✓	✓	Meeting this objective would: • Provide **long term** economic, social, environmental, health and wellbeing benefits; • **Prevent** existing problems of traffic congestion and its associated negative economic and environmental impacts from worsening. **Prevent** health and wellbeing problems within local communities that are caused by sedentary lifestyles; • **Integrate** with the Vale of Glamorgan's Wellbeing Plan, Active Travel INM and Local Transport Plan; • Require **collaboration** between different parts of the local authority, neighbouring local authorities, local businesses and local communities; and • Require **involvement** between key stakeholders within the Vale of Glamorgan, Transport for Wales and the Welsh Government.
2	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	1. Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; 2. Volume of traffic is a barrier to walking and cycling; 3. High levels of car use and low levels of public transport use; 4. Sustainable transport options not an attractive alternative to car travel; 5. Unreliable and slow journey times of bus services; 6. Lack of park and ride facilities limits opportunities for public transport interchange; 7. Low levels of active travel; 8. Safety issues act as a barrier to walking and cycling; 9. Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; 10. Lack of facilities for cyclists at trip origin and destination; 11. Environmental factors reduce the attractiveness of walking and cycling; 12. Topography of the area acts as a barrier to walking and cycling; 13. Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth; and 14. Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible	✓	✓	✓	✓	✓	Meeting this objective would: • Provide **long term** economic, social, environmental, health and wellbeing benefits; • **Prevent** existing problems of traffic congestion and its associated negative economic and environmental impacts from worsening. **Prevent** health and wellbeing problems within local communities that are caused by sedentary lifestyles; • **Integrate** with the Vale of Glamorgan's Wellbeing Plan, Active Travel INM and Local Transport Plan; • Require **collaboration** between different parts of the local authority, neighbouring local authorities, local businesses and local communities; and • Require **involvement** between key stakeholders within the Vale of Glamorgan, Transport for Wales and the Welsh Government.

3	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being.	1. Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; 2. Volume of traffic is a barrier to walking and cycling; 3. High levels of car use and low levels of public transport use; 4. Sustainable transport options not an attractive alternative to car travel; 5. Unreliable and slow journey times of bus services; 6. Lack of park and ride facilities limits opportunities for public transport interchange; 7. Low levels of active travel; 8. Safety issues act as a barrier to walking and cycling; 9. Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; 10. Lack of facilities for cyclists at trip origin and destination; 11. Environmental factors reduce the attractiveness of walking and cycling; 12. Topography of the area acts as a barrier to walking and cycling; 13. Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth; and 14. Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible	✓	✓	✓	✓	✓	Meeting this objective would: • Provide **long term** economic, social, environmental, health and wellbeing benefits; • **Prevent** problems associated with poor accessibility by sustainable modes e.g. inequality of access to opportunities, poor access to employment, key services and facilities, traffic congestion. **Prevent** health and wellbeing problems within local communities that are caused by sedentary lifestyles; • **Integrate** with the Vale of Glamorgan's Wellbeing Plan, Active Travel INM and Local Transport Plan; • Require **collaboration** between different parts of the local authority, neighbouring local authorities, local businesses and local communities; and • Require **involvement** between key stakeholders within the Vale of Glamorgan, Transport for Wales and the Welsh Government.
4	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	1. Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; 2. Volume of traffic is a barrier to walking and cycling; 3. High levels of car use and low levels of public transport use; 4. Sustainable transport options not an attractive alternative to car travel; 5. Unreliable and slow journey times of bus services; 6. Lack of park and ride facilities limits opportunities for public transport interchange; 7. Low levels of active travel; 8. Safety issues act as a barrier to walking and cycling; 9. Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; 10. Lack of facilities for cyclists at trip origin and destination; 11. Environmental factors reduce the attractiveness of walking and cycling; 12. Topography of the area acts as a barrier to walking and cycling; and 14. Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, Resilient, More Equal, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible	✓	✓	✓	✓	✓	Meeting this objective would: • Provide **long term** economic, social, environmental, health and wellbeing benefits; • **Prevent** existing problems of traffic congestion and its associated negative economic and environmental impacts from worsening. **Prevent** a lack of efficient sustainable transport options acting as a barrier to future economic growth and investment; • **Integrate** with the Vale of Glamorgan's Wellbeing Plan, Active Travel INM and Local Transport Plan; • Require **collaboration** between different parts of the local authority, neighbouring local authorities, local businesses and local communities; and • Require **involvement** between key stakeholders within the Vale of Glamorgan, Transport for Wales and the Welsh Government .
5	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	1. Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; 2. Volume of traffic is a barrier to walking and cycling; 7. Low levels of active travel; 9. Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; 11. Environmental factors reduce the attractiveness of walking and cycling; 13. Road traffic emissions and congestion contribute to reduced air quality and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth; and 14. Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	 Prosperous, Resilient, Healthier, Cohesive Communities, Vibrant Culture, Globally Responsible	✓	✓	✓	✓	✓	Meeting this objective would: • Provide **long term** economic, social, environmental, health and wellbeing benefits; • **Prevent** existing problems of traffic congestion and its associated negative economic and environmental impacts from worsening. **Prevent** sustainable transport having a negative impact upon the historic, built and natural environment; • **Integrate** with the Vale of Glamorgan's Wellbeing Plan, Active Travel INM and Local Transport Plan; • Require **collaboration** between different parts of the local authority, neighbouring local authorities, local businesses and local communities; and • Require **involvement** between key stakeholders within the Vale of Glamorgan, Transport for Wales and the Welsh Government.

Worksheet 4a: Option Development - Potential Options

Ref	Option Title	Description	Source	Theme	Comment
1	Penarth Headland Link	The lack of walking and cycling links between Penarth seafront and Cardiff Barrage reduces the potential for encouraging walking and cycling journeys between the two areas. The topography of routes from Cardiff Barrage into Penarth acts as a constraint to encouraging walking and cycling from the Barrage into Penarth and vice versa. This limits the leisure and tourism potential offered by users of the Barrage to the economy of Penarth. The Penarth Headland Link proposal involves the construction of a shared-use pedestrian and cycle route to improve connectivity between Penarth and Cardiff Bay. The 1.1km route would run from the western end of Cardiff Barrage to Penarth Pier and would extend the existing Wales Coastal Path. The route would improve accessibility and remove the barrier of topography, which would be particularly beneficial to those with mobility problems. The Penarth Headland Link is included as an active travel route proposal in the Vale of Glamorgan's Active Travel INM and is shown as having a likely delivery timescale of 10-15 years.	Vale of Glamorgan Active Travel INM; Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); Penarth Headland Link Feasibility Report and Value of Work Done, Penarth Headland Link Group (Feb 2017); WelTAG consultation events (Jan 2019)	Active Travel	To be considered as part of the Active Travel INM option (refer to worksheet 4b, option 1).
2	Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM	The lack of a joined-up network of active travel links within Penarth and to the wider active travel network, e.g. to Cardiff, along with the congested nature of the highway network, limits the potential of active travel as an option for everyday journeys. The provision of new active travel infrastructure would encourage greater levels of walking and cycling and improve links between key services. The delivery of the active travel proposals within the Vale of Glamorgan's Active Travel INM would improve connectivity and the attractiveness of active travel between key origins and destinations within Penarth and to the wider area. Additional information is available about the active travel route from the Merrie Harrier to Pont y Werin and Penarth Road as a previous feasibility study considered the route and proposed a number of cycle and pedestrian infrastructure measures (Capita 2016). The proposed scheme involves a number of shared-use facilities for pedestrians and cyclists along key sections of route in the northern Penarth and Llandough area, including along the north side of the A4055 Barry Road from Merrier Harrier junction to Barons Court junction. The scheme also proposes cycle infrastructure measures along the route including advanced stop lines and cycle symbols on the carriageway to raise awareness. It should be noted that the following additional improvements in Penarth were suggested through the WelTAG consultation that are not currently included in the Active Travel INM: Reopening the tunnel below the A4160 Windsor Road to Cogan Station; Pedestrian link between Tennyson Drive and Cowslip Drive; Pedestrian link between Fairfield Road and Gainsborough Road; Continuation of Railway Walk for walking and cycling. Suggestions for additional active travel improvements would initially need to be considered as part of any future review of the INM and will not be considered by this WelTAG study.	Vale of Glamorgan Active Travel INM; Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); Merrie Harrier to Barons Court Strategic Cycle Routes, Capita (Mar 2016); WelTAG consultation events (Jan 2019)	Active Travel	Option retained (refer to worksheet 4b, option 1).
3	Area wide active travel infrastructure and softer measures e.g. lighting of routes, expansion of 20mph zones, introduction of shared spaces, provision of facilities at employment sites, bike hire, walking buses.	Measures to improve existing active travel and highway infrastructure for pedestrians and cyclists can encourage greater levels of active travel e.g. by improving the safety and security of routes for more vulnerable users. Such proposals include the lighting of active travel infrastructure to increase the attractiveness of routes at all times of the day/ year and speed reduction measures on the highway network, such as the introduction of 20mph zones, to create a more attractive active travel environment. The introduction of a 20mph limit in Penarth Marina was suggested during the WelTAG consultation. Improved facilities at employment sites and other destinations, e.g. the provision of secure bike storage, pool bikes and employer incentives, can also increase the attractiveness of active travel as a realistic everyday travel option. The success of the 'Next Bike' bike hire scheme in Cardiff and the potential of expanding the scheme to Penarth also offers potential for increasing levels of active travel by removing constraints to travelling by bike for short journeys. Softer measures such as the introduction of walking buses at schools can also encourage greater levels of active travel for school journeys. It should be noted that a number of these measures, e.g. the provision of facilities at employment sites, expanding the bike hire scheme and walking buses, are reliant on implementation by a third party.	WelTAG consultation events (Jan 2019)	Active Travel	To be considered as part of the Active Travel INM option (refer to worksheet 4b, option 1).
4	Cogan Station Upgrade	The current provision for park and ride at Cogan Station is limited, the station has poor quality pedestrian links to the surrounding area and highway network in the vicinity of the station experiences problems of congestion. The Cogan Station scheme involves upgrading the existing railway station to create a new multimodal transport facility serving the Penarth Marina and Cardiff Bay areas. The proposed upgrade aims to deliver a mixed-use development that combines station enhancements, including an additional platform on the Penarth branch line, with residential and retail facilities. The Arup 2018 study considered a number of sub-options for the station upgrade and provision of an expanded park and ride facility. The recommended sub-option include the following elements: A large park and ride facility (168 spaces) with improved facilities and road access located on a vacant site to the east of the study area; Improvements to passenger facilities including a new station ticket hall, passenger waiting areas and customer toilets on the station platform; Improved access on the A4160 Windsor Road and improvements to the road infrastructure including increased roundabout capacity; Provision of bus and taxi interchange facilities to allow better links to Penarth Marina/ Cardiff Bay; A new platform on the existing Penarth to Cardiff line; A new 'access for all' footbridge to the main eastbound platform; New residential development on the currently vacant site to the east. Suggestions were made during the WelTAG consultation for improvements to the highway network in the vicinity of Cogan Station e.g. replacement of Cogan roundabout with a traffic-signalled junction and provision of crossing facilities for pedestrians and cyclists. The WelTAG consultation also highlighted the need for improvements to the active travel environment and improved access for pedestrians and cyclists to Cogan Station.	Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); WelTAG consultation events (Jan 2019)	Public transport improvements (rail, interchange)	To be considered as part of a multi-modal transport interchange option (refer to worksheet 4b, option 3).
5	Cosmeston Bus P&R	There are currently no park and ride facilities available for those living within the Cosmeston/ Sully area and options for rail park and ride in Penarth area generally are limited. The provision of a bus park and ride facility (150 spaces) at Cosmeston would aim to remove car trips from the highway network in and around Penarth, reduce congestion along the B4267 Lavernock Road and increase sustainable travel options for commuting journeys into Cardiff. Land at Cosmeston has been identified within the Vale of Glamorgan's Local Development Plan as being suitable to accommodate a large surface car park. The site currently comprises a car park with a gravel surface and has good access to the adjacent B4267 with access to the car park via a priority junction. Delivery of the scheme would need to be supported by bus priority measures on the bus route to and from the park and ride facility to ensure the bus journey time for those using the park and ride presents an attractive alternative to the journey by private car (refer to option 8). It should be noted that the Arup 2018 study considered three potential sub-options for the location of a park and ride and the preferred sub-option recommended was to expand existing rail park and ride facilities at Eastbrook Rail Station. This current study has not assessed Eastbrook park and ride as an option as the station is outside the study area.	Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); Vale of Glamorgan Local Development Plan (2017); WelTAG consultation events (Jan 2019)	Bus Park and Ride	To be considered as part of an option that combines bus park and ride and sustainable transport links across Cardiff Barrage (refer to worksheet 4b, option 2). NB. The description makes reference to the Eastbrook rail park and ride proposal. This scheme is not being considered as part of this study as it is outside the study area.
6	Area wide interchange measures e.g. improved connections between buses, trains and active travel, improvements to bus stops and real time information	Measures to improve interchange and connectivity between public transport modes, as well as between public transport and active travel, would improve and simplify the user experience and increase the attractiveness of public transport options. Such measures could include; improved timetabling to enhance connectivity between buses and trains; improved interchange infrastructure for buses at or in the vicinity of rail stations; enhanced information/ timetable provision at bus stops and rail stations to enable easy interchange between modes; improved pedestrian and cycle links into rail stations, along with the provision of secure bike parking at stations.	WelTAG consultation events (Jan 2019)	Public transport improvements (interchange)	Interchange measures to be considered as part of two options i.e. the multi-modal transport interchange option and the bus park and ride and sustainable transport links across Cardiff Barrage option (refer worksheet 4b, options 2 and 3).

7	Integrated ticketing	The ability to transfer from one mode of public transport to another in South Wales is rarely seamless. There is often no complementary timetabling between bus and rail, whilst many rail stations do not have regular bus services calling at stops within a close distance. Transferring between bus and rail services or between bus services run by different operators requires separate tickets to be purchased to allow travel. The lack of simple-to-use, integrated ticketing acts as a barrier to encouraging travel by public transport. Integrated ticketing would enable a single ticket to be purchased to cover both bus and rail travel. This would improve the accessibility, convenience and attractiveness of travel by public transport and remove some of the hindrance of interchanging between services. It should be noted that due to the nature of everyday travel, integrated ticketing cannot be introduced on a single local authority basis and would need to be implemented at a Wales-wide level.	WelTAG consultation events (Jan 2019)	Public transport improvements (interchange)	Option not being considered as part of this study. Any integrated ticketing initiative would need to be taken forward by Transport for Wales and is outside of the remit of this study.
8	Cosmeston to Cardiff Barrage Bus Priority	Traffic levels and congestion on the route from Cosmeston to Cardiff Barrage results in buses experiencing delays along the B4267 Lavernock Road and within Penarth town centre. The unreliability and slow journey times of bus services due to traffic delays reduces the attractiveness of bus as a mode of travel. The scheme would put in place bus priority measures between Cosmeston and Cardiff Barrage, to improve journey times for buses. This would include improvements at key junctions and optimisation of traffic signals to reduce bus journey times. Measures could include local widening, lane reallocation, junction upgrades at pinch points and would potentially require land acquisition. The scheme would also include improvements to bus stops along the route. The Arup 2018 study undertook a feasibility appraisal of four potential alignments for the bus priority scheme between Cosmeston and Cardiff Barrage. The 'emerging preferred sub-option' from the feasibility assessment involves a range of bus measures along Westbourne Road, the A4160 Stanwell Road, Clive Place and Paget Terrace/ Road which subsequently provides access to Cardiff Barrage. It should be noted that the success of the scheme as assessed by Arup is subject to the implementation of bus services across Cardiff Barrage.	Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018)	Public transport improvements (bus priority)	To be considered as part of an option that combines bus park and ride and sustainable transport links across Cardiff Barrage (refer to worksheet 4b, option 2).
9	Merrie Harrier to Cardiff Barrage Bus Priority	Traffic levels and congestion on the route from the Merrie Harrier junction to Cardiff Barrage results in buses experiencing delays in the vicinity of Merrie Harrier junction and Cogan Hill roundabout. The unreliability and slow journey times of bus services due to traffic delays reduces the attractiveness of bus as a mode of travel. The scheme would put in place bus priority measures between the Merrie Harrier junction and Cardiff Barrage, to improve journey times for buses. The proposed scheme would help improve the capacity of junctions along the route through local widening, lane reallocation and junction upgrades at pinch points. A 2015 feasibility study by Capita recommended a package of measures along the route including road configuration improvements at the Merrie Harrier junction; separation of straight and right-turning movements from the Barons Court junction; road configuration improvements at the Cogan Roundabout junction to reduce delay; bus stop improvements along the route to improve the public transport user experience. It should be noted that the success of the scheme as assessed by Arup is subject to the implementation of bus services across Cardiff Barrage.	Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); Dinas Powys to Cardiff Corridor Bus Priority Measures, Capita (May 2015)	Public transport improvements (bus priority)	Option not being considered as part of this study. Scheme is being considereddd as part of the WelTAG Stage 2 for Dinas Powys.
10	Introduction of buses on Cardiff Barrage	The current route for buses travelling from Penarth to Cardiff is via heavily trafficked roads with no bus priority measures in place. Buses are subject to the same delays as private vehicles and journeys by bus take longer than the equivalent journey by car. The unreliability and slow journey times of bus services reduces the attractiveness of travel by bus as an alternative to the car, particularly for commuting journeys. The introduction of a bus route via Cardiff Barrage would significantly improve access from Penarth and Penarth Marina. The proposal links closely to options 8 and 9 considered above. The scheme would put in place a bus route along the length of Cardiff Barrage linking in to Cardiff Bay. Consideration would need to be given to the infrastructure required to enable buses to travel the length of the barrage, as currently a significant section of the barrage is only accessible by pedestrians and cyclists. The existing active travel route along the barrage may require widening and land acquisition, with the segregation of buses and those walking and cycling being a key issue. Consideration would also need to be given to the operational nature of the barrage and the impact that water traffic crossing the barrage would have on bus timetabling and delays. Issues regarding the introduction of buses onto the barrage have previously been considered in a report by Arup (2015).	WelTAG consultation events (Jan 2019); Cardiff Bay Barrage Transport Link, Arup (Oct 2015)	Public transport improvements (bus priority)	Sustainable transport across Cardiff Barrage be considered as part of an option that combines bus park and ride and sustainable transport links across Cardiff Barrage (refer to worksheet 4b, option 2).
11	Opening Cardiff Barrage to private vehicles during peak periods	The current route for all traffic travelling from Penarth to Cardiff is via heavily trafficked roads with high traffic volumes and problems of congestion. The route along Cardiff Barrage from Penarth to Cardiff Bay would be a significantly shorter and quicker route for those commuting from Penarth, especially for those working in and around Cardiff Bay. The scheme would allow all traffic to travel the route of the Barrage during peak periods. The proposal is closely linked to option 10 above and would be dependent upon the implementation of the scheme to introduce buses on to the Barrage.	WelTAG consultation events (Jan 2019)	Highway network improvements	Option retained (refer to worksheet 4b, option 4).
12	Improvements to public transport services	A number of improvements to public transport services were suggested during the WelTAG consultation e.g. provision of a shuttle bus linking Penarth to the new health centre in Cogan, dedicated bus service to Llandough hospital, regular circular bus from Dinas Powys to Penarth, more direct bus services to Cardiff city centre and the Heath hospital, increase evening and weekend public transport services (particularly Sundays), more bus stops in certain areas.	WelTAG consultation events (Jan 2019)	Public transport improvements (bus, rail)	To be considered as part of an option that combines bus park and ride and sustainable transport links across Cardiff Barrage (refer to worksheet 4b, option 2).
13	Alternative transport proposals e.g. water taxis, self-driving electric pods/ vehicles/ bikes, monorail or shuttle bus linking Penarth and Cardiff, light rail to Penarth and Cosmeston, powered uphill cycle lifts, cable car	A range of alternative transport options were highlighted during the WelTAG consultation. These include alternative means of linking Penarth and Cardiff including water taxis, electric vehicles or bikes, a monorail or shuttle bus. As with option 10 above, the introduction of any form of vehicle on Cardiff Barrage would need consideration of the infrastructure required to enable a route for vehicles to be implemented along the length of the barrage and would need to address the potential issues of conflict with pedestrians and cyclists using the barrage. Other large-scale schemes suggested included the introduction of light rail linking Penarth and Cosmeston, a cable car in the vicinity of the proposed Penarth Headland Link and the introduction of powered uphill cycle lifts.	WelTAG consultation events (Jan 2019)	Innovative transport solutions	Majority of elements to be considered as part of an option that combines bus park and ride and sustainable transport links across Cardiff Barrage (refer to worksheet 4, option 2). NB. The description makes reference to the introduction of light rail linking Penarth and Cosmeston. This proposal would need to be progressed by Transport for Wales and the scheme has not been considered as part of this study.
14	Technological advancements e.g. infrastructure to support electric vehicles	Technological advancements in transport have the potential to improve transport connectivity and sustainability e.g. autonomous vehicles, alternative fuels, use of electric vehicles, provision of infrastructure required to support electric vehicles. The utilisation of transportation technologies could be delivered on an area-wide basis.	WelTAG consultation events (Jan 2019)	Innovative transport solutions	Technological advancements and the need to 'future proof' to be considered as part of all options (refer to worksheet 4b, options 1, 2, 3 and 4)
15	Reducing the demand for travel e.g. travel plans, homeworking, planning of future developments	Measures that reduce the demand for travel aim to reduce the number, frequency and length of journeys undertaken, particularly by private car, thereby removing traffic from the highway network. Long term factors that can reduce the demand for travel include the planning of future developments to ensure convenient and easily accessible services that minimise the need to travel for everyday journeys. Softer measures such as the use of travel plans and employer policies in relation to flexible working, homeworking and teleconferencing can also reduce the need to travel and subsequently reduce the volume of traffic, particularly during peak periods.	WelTAG consultation events (Jan 2019)	Reducing travel demand	Measures to reduce the demand for travel will be progressed alongside all options and are not being specifically considered as part of this study.
16	Implementation of Vale of Glamorgan's Parking Strategy and provision of additional parking	The availability and cost of car parking can impact upon how people choose to travel and influences whether travel by car is viewed as a more attractive option than the journey by more sustainable modes. The Vale of Glamorgan has recently developed a Parking Strategy and the implementation of this will introduce parking charges in Penarth. Options relating to parking provision were also suggested during the WelTAG consultation including the potential of extending parking at the Penarth end of Cardiff Barrage (potentially to provide a park and ride) and restricting parking to one side of the road in Penarth to improve traffic flow.	WelTAG consultation events (Jan 2019)	Car parking	The Vale of Glamorgan's Parking Strategy is being delivered separately and is not being considered as part of this study.
17	Do Minimum	Undertake no dedicated further improvements in the area except from routine maintenance as and when required to keep routes operational.	WelTAG requirement	Maintenance	Option retained (refer worksheet 4b, option 5).

Worksheet 4b: Option Development - Agreed Long List of Options

Ref	Option Title	Description	Source	Theme
1	Active travel proposals for Penarth within the Vale of Glamorgan's Active Travel INM	This option involves delivering the proposals within the Vale of Glamorgan's Active Travel Integrated Network Map (INM).The lack of a joined-up network of active travel links within Penarth and to the wider active travel network, e.g. to Cardiff, along with the congested nature of the highway network, limits the potential of active travel as an option for everyday journeys. The provision of new active travel infrastructure would encourage greater levels of walking and cycling and improve links between key services. The delivery of the active travel proposals within the Vale of Glamorgan's Active Travel INM would improve connectivity and the attractiveness of active travel between key origins and destinations within Penarth and to the wider area. The INM proposals in the Penarth area include a programme of schemes, which are highlighted as having a 'predictive delivery' timescale of 0-5 years (short term schemes), 5-10 years (medium terms schemes) and 10-15 years (long term schemes). The proposals include two active travel schemes that have been considered by previous feasibility studies: - Penarth Headland Link – Construction of a shared-use pedestrian and cycle route to improve connectivity between Penarth and Cardiff Bay. The 1.1km route would run from the western end of Cardiff Barrage to Penarth Pier and would extend the existing Wales Coastal Path. Identified in the INM as a long term proposal. Previous studies that have considered the feasibility and economic case for the proposal include those by the Penarth Headland Link Group (2017), Sustrans (2018), Arup (Apr 2018) and Arup (Oct 2018); and - Merrie Harrier to Pont y Werin and Penarth Road – Identified in the INM as a medium term proposal. A previous feasibility study by Capita (2016) considered this route and proposed a number of cycle and pedestrian infrastructure measures. In addition to the delivery of the INM this option includes consideration of the following area-wide measures: - Measures to improve existing active travel and highway infrastructure for pedestrians and cyclists can encourage greater levels of active travel e.g. by improving the safety and security of routes for more vulnerable users. Such proposals include the lighting of active travel infrastructure to increase the attractiveness of routes at all times of the day/ year and speed reduction measures	• Vale of Glamorgan Active Travel Intergrated Network Map; • Penarth Headland Link Feasibility Report and Value of Work Done, Penarth Headland Link Group (Feb 2017); • Penarth Headland Economic Impact Study, Sustrans (April 2018); • Penarth Headland Link: Stage 1 Maritime and Geotechnical Review, Arup (Apr 2018); • Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts	Active Travel

Worksheet 4b: Option Development - Agreed Long List of Options

Ref	Option Title	Description	Source	Theme
		on the highway network, such as the introduction of 20mph zones or shared spaces, to create a more attractive active travel environment; - Improved facilities at employment sites and other destinations, e.g. the provision of secure bike storage, pool bikes and employer incentives, can also increase the attractiveness of active travel as a realistic everyday travel option; - The success of the 'Next Bike' bike hire scheme in Cardiff and the potential of expanding the scheme to Penarth also offers potential for increasing levels of active travel by removing constraints to travelling by bike for short journeys; and - Softer measures such as the introduction of school travel plans and walking buses at schools can also encourage greater levels of active travel for school journeys. It should be noted that a number of these measures, e.g. the provision of facilities at employment sites, expanding the bike hire scheme and walking buses, are reliant on implementation by a third party. NB. The following additional improvements in Penarth were suggested through the WelTAG consultation that are not currently included in the Active Travel INM: Reopening the tunnel below the A4160 Windsor Road to Cogan Station; Pedestrian link between Tennyson Drive and Cowslip Drive; Pedestrian link between Fairfield Road and Gainsborough Road; Continuation of Railway Walk for walking and cycling. Suggestions for additional active travel improvements would initially need to be considered as part of any future review of the INM and will not be considered by this WelTAG study.	Assessment Report – Final (version 1.0), Arup (Oct 2018); • Merrie Harrier to Barons Court Strategic Cycle Routes, Capita (Mar 2016); and • WelTAG consultation events (Jan 2019)	

Worksheet 4b: Option Development - Agreed Long List of Options

Ref	Option Title	Description	Source	Theme
2	Bus park and ride and sustainable transport links across Cardiff Barrage	This option involves providing attractive and convenient sustainable transport options for the journey between Penarth and Cardiff through the implementation of a bus park and ride scheme, associated bus priority measures and sustainable transport provision across Cardiff Barrage into Cardiff. The current route for buses travelling from Penarth to Cardiff is via heavily trafficked roads with no bus priority measures in place. Buses are subject to the same delays as private vehicles and journeys by bus take longer than the equivalent journey by car. The unreliability and slow journey times of bus services due to traffic delays reduces the attractiveness of travel by bus as an alternative to the car, particularly for commuting journeys. There are currently no park and ride facilities available for those living within the Cosmeston/ Sully area and options for rail park and ride in Penarth area generally are limited. The provision of a bus park and ride facility at Cosmeston would aim to remove car trips from the highway network in and around Penarth, reduce congestion along key routes and increase sustainable travel options for commuting journeys into Cardiff. Land at Cosmeston has been identified within the Vale of Glamorgan's Local Development Plan as being suitable to accommodate a large surface car park. The site currently comprises a car park with a gravel surface and has good access to the adjacent B4267 with access to the car park via a priority junction. Delivery of the scheme would need to be supported by bus priority measures on the bus route to and from the park and ride facility to ensure the bus journey time for those using the park and ride presents an attractive alternative to the journey by private car. The bus priority measures between Cosmeston and Cardiff Barrage could include improvements at key junctions and optimisation of traffic signals to reduce bus journey times. Measures could include local widening, lane reallocation, junction upgrades at pinch points and would potentially require land acquisition. The scheme would also include improvements to bus stops along the route. The Vale of Glamorgan's Local Development Plan includes a policy to provide bus priority measures along Lavernock Road to Cardiff via Cardiff Barrage. More recently a study by Arup (2018) undertook a feasibility appraisal of four potential alignments for the bus priority scheme between Cosmeston and Cardiff Barrage. The 'emerging preferred sub-option' from the feasibility assessment involves a range of bus measures along Westbourne Road, the A4160 Stanwell Road, Clive Place and	• Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); • Vale of Glamorgan Local Development Plan; • WelTAG consultation events (Jan 2019); and • Cardiff Bay Barrage Transport Link, Arup, October 2015	Bus, Interchange, Sustainable Transport

Worksheet 4b: Option Development - Agreed Long List of Options

Ref	Option Title	Description	Source	Theme
		Paget Terrace/ Road which subsequently provides access to Cardiff Barrage. At Cardiff Barrage this option involves the introduction of sustainable transport options for travel into Cardiff via Cardiff Barrage, which would significantly improve access from Penarth and Penarth Marina. A number of innovative sustainable transport options for linking Penarth and Cardiff were suggested during the WelTAG consultation including water taxis, self-driving electric pods/ vehicles/ bikes, monorail or shuttle bus linking Penarth and Cardiff, powered uphill cycle lifts and a cable car. Consideration would need to be given to the infrastructure required to enable any sustainable transport option to travel the length of the barrage, as currently a significant section of the barrage is only accessible by pedestrians and cyclists. The existing active travel route along the barrage may require widening and land acquisition, with potential issues of conflict between the sustainable transport option and those walking and cycling being a key issue. Consideration would also need to be given to the operational nature of the barrage and the impact that water traffic crossing the barrage would have on timetabling and delays to any sustainable transport option. Issues regarding the introduction of buses onto the barrage have previously been considered in a report by Arup (2015). Associated measures to be considered as part of this option include: - bus service improvements, and - measures to improve interchange and connectivity between public transport/sustainable transport modes to simplify the user experience e.g. improved timetabling, enhanced information provision etc.		

Worksheet 4b: Option Development - Agreed Long List of Options

Ref	Option Title	Description	Source	Theme
3	Multi-modal sustainable transport interchange	This option involves upgrading the existing railway station at Cogan to create a new multimodal transport interchange facility serving the Penarth Marina and Cardiff Bay areas. The current provision for park and ride at Cogan Station is limited, the station has poor quality pedestrian links to the surrounding area and the highway network in the vicinity of the station experiences problems of congestion. The option would deliver a mixed-use development that combines station enhancements, including an additional platform on the Penarth branch line, with residential and retail facilities. The study by Arup (2018) considered a number of sub-options for the station upgrade and provision of an expanded park and ride facility. The recommended sub-option include the following elements: - A large park and ride facility (168 spaces) with improved facilities and road access located on a vacant site to the east of the study area; - Improvements to passenger facilities including a new station ticket hall, passenger waiting areas and customer toilets on the station platform; - Improved access on the A4160 Windsor Road and improvements to the road infrastructure including increased roundabout capacity; - Provision of bus and taxi interchange facilities to allow better links to Penarth Marina/ Cardiff Bay; - A new platform on the existing Penarth to Cardiff line; - A new 'access for all' footbridge to the main eastbound platform; - New residential development on the currently vacant site to the east. Suggestions were made during the WelTAG consultation for improvements to the highway network in the vicinity of Cogan Station e.g. replacement of Cogan roundabout with a traffic-signalled junction and provision of crossing facilities for pedestrians and cyclists. The WelTAG consultation also highlighted the need for improvements to the active travel environment and improved access for pedestrians and cyclists to Cogan Station. This option will also consider measures to improve interchange and connectivity between public transport/ sustainable transport modes to simplify the user experience e.g. improved timetabling, enhanced information provision, secure bike parking etc.	• Vale of Glamorgan Coastal Corridor – Sustainable Transport Impacts: Scheme Impacts Assessment Report – Final (version 1.0), Arup (Oct 2018); and • WelTAG consultation events (Jan 2019)	Rail, Bus, Interchange, Active Travel

Worksheet 4b: Option Development - Agreed Long List of Options

Ref	Option Title	Description	Source	Theme
4	Opening Cardiff Barrage to private vehicles during peak periods	This option involves allowing Cardiff Barrage to be used by private vehicles during peak periods. The current route for all traffic travelling from Penarth to Cardiff is via heavily trafficked roads with high traffic volumes and problems of congestion. The route along Cardiff Barrage from Penarth to Cardiff Bay would be a significantly shorter and quicker route for those commuting from Penarth, especially for those working in and around Cardiff Bay. The scheme would allow private vehicles to travel the route of the Barrage during peak periods. As with Option 2, consideration would need to be given to the infrastructure required to enable vehicles to travel the length of the barrage, as currently a significant section of the barrage is only accessible by pedestrians and cyclists. The existing active travel route along the barrage may require widening and land acquisition, with the segregation of vehicles and those walking and cycling being a key issue.	• WelTAG consultation events (Jan 2019)	Highway network improvements
5	Do Minimum	This option involves undertaking no investment in new transport infrastructure and no dedicated sustainable transport improvements in the area except from routine maintenance as and when required to keep routes operational.	• WelTAG requirement	Maintenance

NB. Option 1-4 to consider opportunities offered by technological advancements in transport (such as electric vehicles) and the need to 'future proof' for such opportunities.

Worksheet 5: Appraisal of Options against the Wales Transport Strategy Outcomes

Option No.	Option	Wales Transport Strategy Outcomes																
		Social					Economy					Environment						
		Improve access to healthcare	Improve access to education, training and lifelong learning	Improve access to shopping and leisure facilities	Encourage healthy lifestyles	Improve the actual and perceived safety of travel	Improve access to employment opportunities	Improve connectivity within Wales and internationally	Improve the efficient, reliable and sustainable movement of people	Improve the efficient, reliable and sustainable movement of freight	Improve access to visitor attractions	Increase the use of more sustainable materials	Reduce the contribution of transport to greenhouse gas emissions	Adapt to the impacts of climate change	Reduce the contribution of transport to air pollution and other harmful emissions	Improve the impact of transport on the local Environment	Improve the impact of transport on our heritage	improve the impact of transport on biodiversity
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	+ +	+ +	+ +	+ + +	+ +	+ +	+	+ + +	0	+ +	0	+ + +	+ + +	+ + +	+ +	+	0
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	+ +	+ +	+ +	0	0	+ +	+ +	+ +	0	+ +	0	+ +	+	+	0	-	-
3	Cogan Multi-Modal Sustainable Transport Interchange	+ +	+ +	+ +	+	+	+ +	+ +	+ +	0	+	0	+ +	+	+	0	0	0
4	Do Minimum	-	-	-	- -	-	-	- -	- -	-	- -	0	-	- -	- -	-	-	-

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 6: Appraisal of Options against the Well-being of Future Generations (Wales) Act 2015 Goals

		Well-being of Future Generations Act Objectives							Vale of Glamorgan Council Well-being Objectives				Vale of Glamorgan's Public Service Board's Well-being Plan			
Option No.	**Option**	A globally responsible Wales	A Wales of vibrant culture and thriving Welsh language	A Wales of cohesive communities	A more equal Wales	A healthier Wales	A resilient Wales	A prosperous Wales	Wellbeing outcome 1: An Inclusive and Safe Vale 1) Reduce poverty and social exclusion 2) Providing decent homes and safe communities	Wellbeing outcome 2: An Environmentally Responsible and Prosperous Vale 3) Promoting regeneration, economic growth and employment 4) Promoting sustainable development and protecting our environment	Wellbeing outcome 3: An Aspirational and Culturally Vibrant Vale 5) Raising overall standards of achievement 6) Valuing culture and diversity	Wellbeing outcome 4: An Active and Healthy Vale 7) Encouraging and promoting active and healthy lifestyles 8) Safeguarding those who are vulnerable and promoting independent living	To enable people to get involved, participate in their local communities and shape local services	To reduce poverty and tackle inequalities linked to deprivation	To give children the best start in life	To protect, enhance and value the environment
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	+ +	+	+ +	+ +	+ + +	+ +	+ +	+ +	+ +	+	+ +	0	+ +	+	+ +
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	+	0	+	+	0	+	+	+	+	+	0	0	+	0	-
3	Cogan Multi-Modal Sustainable Transport Interchange	+	0	+ +	+	+	+	+	+	+ +	+	+	0	+	0	+
4	Do Minimum	- -	0	-	-	-	- -	-	-	- -	-	-	0	-	0	- -

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 6b: Appraisal of Options against the Welsh Government's Well-being Objectives

		Option 1: Active Travel proposals for the Penarth Cardiff Barrage Corridor	Option 2: Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Option 3: Cogan Multi-Modal Sustainable Transport Interchange	Do Minimum
Prosperous and Secure	Support people and businesses to drive prosperity	+	+	+	-
	Tackle regional inequality and promote fair work	+	+	+	-
	Driver sustainable growth and combat climate change	+ +	+	+	- -
Healthy and Active	Deliver quality health and care services fit for the future	0	0	0	0
	Promote good health and well-being for everyone	+ + +	0	+	- -
	Build healthy communities and better environments	+ +	-	0	-
Ambitious and Learning	Support young people to make the most of their potential	+	0	0	0
	Build ambition and encourage learning for life	0	0	0	0
	Equip everyone with the right skills for a changing world	0	0	0	0
United and Connected	Build resiliant communities, culture and language	+	-	0	0
	Deliver modern and connected infrastructure	+ +	+	+ +	-
	Promote and protect Wales' place in the world	+	-	0	-

Worksheet 7 - Local & Regional Policy Appraisal (Part 1: Vale of Glamorgan Local Transport Plan)

Option Ref.	Option	Vale of Glamorgan Local Transport Plan																			
		Active Travel						Park and Ride				Highway Improvement					Bus Infrastructure						
		Increase the number of cycle trips	Increase the number of children cycling to school	Increase off road cycle route provision	Increase on road cycle route provision	Increase Active Travel infrastructure and facilities	Increase the number of cycle stands at public transport interchanges	Increase the number of park and ride spaces	Increase the number of park and ride users	Increase the number of park and ride locations	Increase the number of people using rail park and ride facilities and the rail network	To reduce the number and severity of road traffic casualties	To improve journey times and journey reliability	To reduce congestion at key strategic junctions	To improve air quality at key strategic junctions or areas	To improve the efficient movement of traffic and freight through strategic junctions	To increase passenger numbers	To improve accessibility to bus services for all users	To improve reliability and punctuality	To enhance waiting facilities	To improve opportunities for interchange	To improve information provision	To improve safety and security
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	+ + +	+ + +	+ +	+ + +	+ + +	+	0	0	0	+	+	+	+	+	0	0	+	0	0	+ +	0	0
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	0	0	0	0	0	+	+ + +	+ +	+ + +	0	0	+ +	+	+	0	+ +	+ +	+ +	+ +	+ + +	+	+
3	Cogan Multi-Modal Sustainable Transport Interchange	+	0	0	0	+ +	+	+ + +	+ + +	+ +	+ +	0	+ +	0	0	0	+	+	+	+	+ + +	+ +	+ +
4	Do Minimum	0	0	0	0	0	0	0	0	0	0	-	- -	- -	-	-	0	0	-	0	0	0	0

Notes

To avoid double counting in appraisal process only those objectives which are not covered in the AST assessment or WTS assessment are included.

Key

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 7 - Local & Regional Policy Appraisal (Part 2: Cardiff Capital Region Strategic Objectives)

		Cardiff Capital Region Strategic Objectives																			
		Prosperity & Opportunity								Inclusion & Equality						Culture, Community & Sustainability						
Option Ref.	Option	Building the capacity of individuals, households, public sector & businesses to meet the challenges & grasp opportunity creating a more productive economy	Providing the right infrastructure including connectivity by means of good transport links and highspeed broadband	Encouraging a culture of innovation and entrepreneurship by providing the right skills, opportunities and support to engender a confidence to be creative	Ensuring that the city-regions labour market is equipped with the skills that businesses need	Improving public sector efficiency and effectiveness by new ways of working	Supporting all businesses to become more productive, from small retail to large advanced manufacturers	Enhancing the business climate for emerging sectors, enterprises and innovation	Encourage and promote research and development and entrepreneurial enterprise	A vibrant and sustainable economy which contributes to the well-being and quality of life of people and communities now and in the future	Access to employment and economic opportunities	Participation in the labour market for all members of society	Access to a range of housing, including affordable	Access to education and training to develop skills	Access to social and recreational opportunities	Forging a clear identity and strong reputation as a City-Region for trade, innovation, and quality of life	Ensure our urban centres are vibrant and vital with unique identities which all of the regions residents can use and be proud of	Respect, protect and support our rural and natural environment and use it to promote economic and social outcomes	Develop and promote our world-class cultural and recreational opportunities utilising the regions natural beauty and historic areas	Provide a quality environment across the whole region including existing and new development that attracts businesses and talented people	Demonstrate our commitment to a sustainable future and acknowledge our global responsibility	Work with political and commercial partners, at a national, regional and local level to coordinate the promotion of the region
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	0	+ + +	0	0	0	+	0	0	+ + +	+ +	+	0	+ +	+ +	+	+ +	+	+ +	+	+ + +	0
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	0	+ +	0	0	0	+	0	0	+	+ +	+	0	+ +	+ +	+	+	0	0	+	+	0
3	Cogan Multi-Modal Sustainable Transport Interchange	0	+ +	0	0	0	+	0	0	+	+ +	+	0	+ +	+ +	+	+	0	0	+	+	0
4	Do Minimum	0	- -	0	0	0	-	0	0	- -	-	-	0	-	0	-	-	-	-	-	- - -	0

Notes

To avoid double counting in appraisal process only those objectives which are not covered in the AST assessment or WTS assessment are included.

Key

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 8: Appraisal of Scheme Options against Scheme Objectives

Option No.	Option	Objectives				
		Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel	Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.	Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being	Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	+ + +	+ + +	+ + +	+ +	0
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	+	+	+ +	+	0
3	Cogan Multi-Modal Sustainable Transport Interchange	+	+ +	+	+ +	+
4	Do Minimum	- -	- -	- -	- -	-

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 9A: Options against Identified Problems (1 of 2 Tables)

Identified Problems

Option No.	Option	Volume of traffic and levels of congestion cause unreliable journey times, delay and pollution	Volume of traffic is a barrier to walking and cycling	High levels of car use and low levels of public transport use	Sustainable transport options not an attractive alternative to car travel	Unreliable and slow journey times of bus services	Lack of Park and Ride facilities limits opportunities for public transport interchange	Low levels of Active Travel
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	+	+ +	0	+ +	+	0	+ + +
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	+	+	+ +	+ +	+ +	+ + +	+
3	Cogan Multi-Modal Sustainable Transport Interchange	+	0	+ +	+ +	0	+ + +	+
4	Do Minimum	-	-	- -	- -	- -	-	- -

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 9A: Options against Identified Problems (2 of 2 Tables)

Identified Problems (Continued)

Option No.	Option	Safety issues act as a barrier to walking and cycling	Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes	Lack of facilities for cyclists at trip origin and destination	Environmental factors reduce attractiveness of walking and cycling	Topography of the area acts as a barrier to walking and cycling	Road traffic emissions and congestion contribute to reduced air quality in some areas and an Air Quality Management Area (AQMA) has previously been in place on Windsor Road, Penarth	Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	+ +	+ + +	+ +	+	+	+ +	+ + +
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	-	0	+	0	0	+	+ +
3	Cogan Multi-Modal Sustainable Transport Interchange	+	+	+ +	0	0	0	+ +
4	Do Minimum	- -	- -	-	0	0	- - -	- -

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 9b: How the Long List Options will Tackle the Identified Problems, and Other Relevant Issues

How the Options Tackles the Problem				
Option No.	**Option**	**How the Option will Tackle the Identified Problems**	**Other Relevant Issues**	**Overall rating**
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	Option 1 seeks to improve the attractiveness and accessibility of walking or cycling for everyday journeys, e.g. commuting, and reduce levels of car use. Option 1 has the potential to have a positive impact on all the identified problems: - Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; - Volume of traffic is a barrier to walking and cycling; - High levels of car use and low levels of public transport use; - Sustainable transport options not an attractive alternative to car travel; - Unreliable and slow journey times of bus services; - Lack of park and ride facilities limits opportunities for public transport interchange; - Low levels of Active Travel; - Safety issues act as a barrier to walking and cycling; - Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; - Lack of facilities for cyclists at trip origin and destination; - Environmental factors reduce the attractiveness of walking and cycling; - Topography of the area acts as a barrier to walking and cycling; - Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and - Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	The WelTAG Stage Two appraisal has re-considered the impact that each option could have on the identified problems. This is an update of the WelTAG Stage One appraisal. **Two** changes have been made to the 'options against identified problems' appraisal (Tables 9a and 9b) for Option 1 since WelTAG Stage One: - The scoring of 'safety issues act as a barrier to walking and cycling' has been reduced from 'large positive' to 'moderate positive'. This reflects the majority of proposed Active Travel improvements being on-road. - The scoring of 'road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth' has been reduced from 'large positive' to 'moderate positive'. This reflects the scale of Active Travel improvements proposed across the network currently proposed and their likely impact on air quality.	**+ +**
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Option 2 would provide a bus park and ride transport option between the study area and key trip attractors in Cardiff Bay and Cardiff City Centre. Option 2 has the potential to have a positive impact on the following identified problems: - Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; - Volume of traffic is a barrier to walking and cycling; - High levels of car use and low levels of public transport use; - Sustainable transport options not an attractive alternative to car travel; - Unreliable and slow journey times of bus services; - Lack of park and ride facilities limits opportunities for public transport interchange; - Low levels of Active Travel; - Lack of facilities for cyclists at trip origin and destination; - Road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth; and - Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	The WelTAG Stage Two appraisal has re-considered the impact that each option could have on the identified problems. This is an update of the WelTAG Stage One appraisal. **Four** changes have been made to the 'options against identified problems' appraisal (Tables 9a and 9b) for Option 2 since WelTAG Stage One: - The scoring of 'volume of traffic and levels of congestion cause unreliable journey times, delays and pollution' has been reduced from 'moderate positive' to 'slight positive'. This reflects the likely impact of the scheme on congestion levels across the study area. - The scoring of 'unreliable and slow journey times of bus services' has been reduced from 'strong positive' to 'moderate positive'. This reflects the current proposal not including bus priority measures between the bus park and ride and Cardiff Barrage. - The scoring of 'safety issues act as a barrier to walking and cycling' has been reduced from 'neutral' to 'slight negative'. This reflects the potential impact of the introduction of buses on Cardiff Barrage on the perceived safety of pedestrians and cyclists using the route. - The scoring of 'road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth' has been reduced from 'moderate positive' to 'slight positive'. This reflects the likely overall impact of the proposal on air quality.	**+**
3	Cogan Multi-Modal Sustainable Transport Interchange	Option 3 would provide multi-modal interchange opportunities at Cogan Station and aim to increase rail use for everyday journeys. Option 3 has the potential to have a positive impact on the following identified problems: - Volume of traffic and levels of congestion cause unreliable journey times, delays and pollution; - High levels of car use and low levels of public transport use; - Sustainable transport options not an attractive alternative to car travel; - Lack of park and ride facilities limits opportunities for public transport interchange; - Low levels of Active Travel; - Safety issues act as a barrier to walking and cycling; - Lack of safe, accessible, attractive, joined up and direct pedestrian and cycle routes; - Lack of facilities for cyclists at trip origin and destination; and - Poor connectivity to the wider area reduces the potential of tourism and leisure visitors to the economy.	The WelTAG Stage Two appraisal has re-considered the impact that each option could have on the identified problems. This is an update of the WelTAG Stage One appraisal. **Five** changes have been made to the 'options against identified problems' appraisal (Tables 9a and 9b) for Option 3 since WelTAG Stage One: - The scoring of 'volume of traffic and levels of congestion cause unreliable journey times, delays and pollution' has been reduced from 'moderate positive' to 'slight positive'. This reflects the likely impact of the scheme on congestion levels across the study area. - The scoring of 'volume of traffic is a barrier to walking and cycling' has been reduced from 'slight positive' to 'neutral'. This reflects the potential impact of the proposal in increasing traffic volumes in the vicinity of Cogan Station. - The scoring of 'unreliable and slow journey times of bus services' has been reduced from 'slight positive' to 'neutral'. This reflects the potential impact of the proposal in increasing traffic volumes in the vicinity of Cogan Station. - The scoring of 'lack of facilities for cyclists at trip origin and destination' has been increased from 'slight positive' to 'moderate positive'. This reflects the Active Travel improvements proposed as part of Option 3. - The scoring of 'road traffic emissions and congestion contribute to reduced air quality in some areas and an AQMA has previously been in place on Windsor Road, Penarth' has been reduced from 'slight positive' to 'neutral'. This reflects the potential impact of the proposal in increasing traffic volumes in the vicinity of Cogan Station.	**+**
4	Do Minimum	A do minimum approach is likely to see current problems become worse in the long term. The do minimum option is not likely to have a positive impact on any of the identified problems and it is expected that the majority of problems would worsen if this approach was adopted.	The WelTAG Stage Two appraisal has re-considered the impact that each option could have on the identified problems. This is an update of the WelTAG Stage One appraisal. No changes have been made to the 'options against identified problems' appraisal (Tables 9a and 9b) for the 'Do Minimum' option WelTAG Stage One.	**- -**

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 10: Appraisal Summary Table (Part 1 of 2)

Criteria	Qualitative Assessment			
	Option 1 - Active Travel proposals for the Penarth Cardiff Barrage Corridor	Option 2 - Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Option 3 - Cogan Multi-Modal Sustainable Transport Interchange	Do Minimum
Economic				
Business Users & Reliability Impact	0	0	0	-
Regeneration	+ +	0	+ +	- -
Wider Impacts	+ +	0	+	-
Environment				
Noise	+	0	0	-
Air Quality	+ +	0	0	-
Greenhouse Gases	+ +	+	0	-
Landscape	0	- -	+	-
Townscape	+	0	+	-
Historic Landscape	0	0	0	0
Cultural Heritage	+	-	0	0
Biodiversity	0	-	0	-
Water Environment	0	0	0	0
Social and Cultural				
Commuting and Other Users	+ +	+ +	+ +	- -
Reliability Impact on Commuting and Other Users	+	+	+ +	- -
Physical Activity	+ + +	0	+	-
Journey Quality	+ +	+	+ +	-
Accidents	+	-	0	-
Security	+	+	+	0
Access to Services	+ +	+ +	+ +	- -
Welsh Language	0	0	0	0
Tourism	+ +	0	0	-
Affordability	+	- -	+	0
Severance	+ + +	0	+	-
Option Values	+	+	+	0

Large positive (+ ++)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large Negative (- - -)
Not Yet Assessed (NYA)

Worksheet 10: Appraisal Summary Table (Part 2 of 2)

Criteria	Qualitative Assessment			
	Option 1 - Active Travel proposals for the Penarth Cardiff Barrage Corridor	Option 2 - Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Option 3 - Cogan Multi-Modal Sustainable Transport Interchange	Do Minimum
Public Accounts				
Cost to Broad Transport Budget	**£12.8M - £20.8M (2019 Prices)**	**£48.5M (2019 Prices)**	**£7.8M (2019 prices)**	**NYA**
Indirect Tax Revenues	**NYA**	**NYA**	**NYA**	**NYA**
Occurance of Impacts				
When and where impacts will occur (positive and negative)	During the construction and operational stages, in the vicinity of the Active Travel network. Positive impacts to the wider area if car trips are removed from the highway network.	During the construction and operational stages, in the vicinity of the proposed scheme. Positive impacts to local roads and junctions if car trips are removed from the highway network. Potential negative impacts to existing users (pedestrians and cyclsits) of Cardiff Barrage and to Cosmeston Lakes Country Park.	During the construction and operational stages, in the vicinity of Cogan Station. Potential impacts (both positive and negative) to the local highway network e.g. scheme has the potential to remove car trips from the highway network, but concerns expressed through the Stage Two consultation that the scheme may increase traffic on local roads and junctions in the vicinity of Cogan Station.	Negative impacts across the Penarth Cardiff Barrage Corridor study area including local roads and junctions, Penarth town centre etc.
Who or what will experience the impacts	Users of the active travel network. Users of the local highway network. Residents, commuters, businesses and visitors to the area.	Users of the proposed bus park and ride service. Users of the local highway network. Users of Cardiff Barrage. Visitors to Cosmeston Lakes Country Park. Residents, commuters, businesses and visitors to the area.	Users of the rail service and proposed park and ride. Users of the local highway network. Residents, commuters, businesses and visitors to the area.	Users of the local highway network. Residents, commuters, businesses and visitors to the area.

Worksheet 11: Appraisal of Options against Deliverability

Option No.	Option	Feasibility (Technical)	Acceptability	Timescale	Risks	Comments
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	**0**	**+**	**0**	**-**	The deliverability scorings reflect the whole package of Active Travel schemes included in Option 1 (including the PHL). However, the deliverability appraisal is influenced to a large extent by the PHL forming part of Option 1, due to its specific complexity. Feasibility - The majority of proposals within Option 1 are relatively small-scale improvements that should be straightforward from a technical feasibility perspective. The PHL is the most technically complex of all scheme proposals within Option 1, which is a large-scale engineering project and will be a technically complex scheme to design, plan and construct. Acceptability - Overall, feedback from the stakeholder and public consultation was positive in relation to Option 1. The negative comments received were linked to the proposals not being ambitious enough. The majority of comments in relation to the PHL were positive, although some negative comments were received in relation to the potential cost and environmental impacts of the proposal. Timescale - The proposals within Option 1 are at an early stage of development. The majority of proposals within Option 1 will be relatively straightforward to develop and deliver. The PHL will have a longer lead in time to delivery due to the time required for scheme development and design e.g due to the need to undertake environmental requirements, obtain the necessary approvals, agree land matters etc. Risks - The key risks linked to Option 1 are influenced to a large extent by the PHL, due to its specific complexity. The majority of proposals within Option 1 are small-scale improvements with relatively low levels of risk. The PHL has higher levels of risk associated within it due to the scale and complexity of the proposal e.g. linked to environmental considerations due to the local of the proposal. The availability of funding to deliver the PHL is a key risk.
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	**0**	**-**	**0**	**-**	The deliverability scorings reflect all elements of Option 2 i.e park and ride at Cosmeston, bus route to and over Cardiff Barrage. Feasibility - No major technical feasibility issues have been identified in relation to the construction of a park and ride at Cosmeston, although management of the site would need consideration due to the location at Cosmeston Lakes Country Park. Technical and operational challenges relating to the introduction of buses on Cardiff Barrage. Acceptability - Overall, Option 2 received the most negative feedback of all 3 options through the stakeholder and public consultation. Many negative comments were received in relation to the proposed introduction of buses onto Cardiff Barrage and the potential impact on the existing attractive walking and cycling environment along the barrage. Some negative comments were also received in relation to the siting of the proposed park and ride at Cosmeston Lakes Country Park. Timescale - The proposal is at an early stage of development. Key aspects affecting the delivery timescale are linked to scheme development and design e.g the need to undertake environmental requirements due to the location of the proposal, ensuring the technical feasibility of the proposal due to barrage operations, agreeing land matters to enable highway construction at the Cardiff Bay end of the barrage etc. Risks - The risks associated with the proposal are closely linked to the scheme's feasibility and acceptibility e.g. the technical and operational challenges relating to the introduction of buses on Cardiff Barrage and the potential for public oppostion linked to this proposal. The availability of funding to deliver the proposal is a key risk.
3	Cogan Multi-Modal Sustainable Transport Interchange	**+**	**0**	**+**	**0**	Feasibility - Option 3 includes a number of different elements that will have challenges in terms of technical feasibility e.g. the delivery of large-scale improvements at an operational rail station including the provision of an 'Access for All' bridge over the rail line, the delivery of highway improvements at a constrained and congested section of the highway network, the constrained nature of the Cogan site, the level differences of the area of the site required for the park and ride. Overall, the feasibility of Option 3 has scored more positively than the other 2 options as the proposals within Option 3 are more standardised from an engineering perspective i.e. when compared to the PHL and the bus route over Cardiff Barrage. Acceptability - Overall, feedback through the stakeholder and public consultation in relation to Option 3 was mixed. Positive comments were received in relation to the proposed Active Travel and accessibility improvements. A number of negative comments were received in relation to the potential impact of the proposal on increasing traffic and congestion on the local road network. Such concerns would need detailed consideration in the development and design of the proposal. Timescale - The proposal is at an early stage of development. Key aspects affecting the delivery timescale include e.g. the stage of scheme development and design, the need to undertake the GRIP process due to the impact on the operational railway and the involvement of different parties in progressing the proposal ie. TfW, Welsh Government, Vale of Glamorgan Council. Land required for the park and ride is already in Welsh Government ownership. Risks - The risks associated with the proposal include e.g. the early stage of scheme development, the involvement of different parties in progressing the proposal i.e. Welsh Government leading on land purchase, rail elements will need to be progressed by TfW, Vale of Glamorgan Council has responsibility for the local highway network. The availability of funding to deliver the proposal is a key risk.
4	Do Minimum	**0**	**- -**	**0**	**0**	A do minimum approach assumes that no sustainable transport improvements are delivered and has therefore not been rated in terms of technical feasibility, timescales and risk. A do minimum approach would likely see the problems identified become worse, particularly given future developments planned for the Vale of Glamorgan area and a predicted increase in the population of the Cardiff Capital Region in years to come. As such this option has a negative rating in terms of acceptability, as a do minimum approach and a subsequent worsening of identified problems is unlikely to be an acceptable long-term option.

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)

Worksheet 12: Summary of all Worksheets

Option Ref	Option	Wales Transport Strategy Outcomes			WBOFGA Goals	WG Well-being Objectives	Local Transport Plan Objectives	Cardiff Capital Region Strategic Objectives	Scheme Objectives					Tackling Problems	Appraisal Summary Table				Delivery
		Soc.	Econ.	Env.					1	2	3	4	5		Econ.	Env.	Soc. & Cul.	Public Accounts	
1	Active Travel proposals for the Penarth Cardiff Barrage Corridor	+ +	+ +	+ +	+ +	+	+ +	+ +	+ + +	+ + +	+ + +	+ +	0	+ +	+	+	+ +	- -	0
2	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	+	+ +	0	+	0	+ +	+	+	+	+ +	+	0	+	0	-	0	- -	0
3	Cogan Multi-Modal Sustainable Transport Interchange	+ +	+ +	+	+	+	+ +	+	+	+ +	+	+ +	+	+	+	0	+	-	+
4	Do Minimum	-	- -	-	-	-	-	-	- -	- -	- -	- -	-	- -	-	-	-	-	-

Large positive (+ + +)
Moderate positive (+ +)
Slight positive (+)
Neutral (0)
Slight negative (-)
Moderate negative (- -)
Large negative (- - -)
Not Yet Assessed (NYA)

Key:
Scheme Objectives
1 = Enhance sustainable connectivity throughout the Penarth Cardiff Barrage transport corridor to achieve modal shift away from the private car towards public transport and active travel
2 = Reduce barriers that constrain opportunities to increase travel by sustainable transport modes.
3 = Increase sustainable transport options that improve accessibility along the Penarth Cardiff Barrage transport corridor and support social inclusion, health and well-being.
4 = Deliver sustainable transport improvements that encourage increased economic activity and support long term investment.
5 = Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.

Appendix 19 Well-being Assessment Tables

Well-being Assessment Tables

The following tables consider the impacts of each shortlisted option in relation to the well-being goals and objectives of a range of public bodies. The tables provide supporting information to the well-being Strategic Case appraisal included in Appendix 18 (worksheets 6a and 6b) of the IAR.

Well-being Goals of the Well-being of Future Generations (Wales) Act 2015

The following 3 tables consider the impact each of the options could have on each of the well-being goals. The well-being goals as described within the Act have been used to identify strengths, weaknesses, opportunities and threats associated with each option. An overall scoring for each option in relation to each well-being goal has been given.

Option 1 – Active Travel proposals for the Penarth Cardiff Barrage Corridor

Well-being Goal	Strengths and Opportunities	Weaknesses and Threats	Appraisal Scoring
A prosperous Wales	- Active travel improvements will provide opportunities for travel by non-motorised modes along the Penarth Cardiff Barrage Corridor and contribute to a low carbon society by providing opportunities for walking and cycling for everyday journeys. - There are high quality and well-used active travel links already in place within the study area e.g. Cardiff Bay Barrage, Pont-y-Werin – potential to build upon the success of these existing links and encourage longer and more frequent journeys by walking and cycling if the network of links was expanded. - Larger scale active travel proposals, e.g. Penarth Headland Link, could have wider tourism and leisure benefits.	- For maximum impact in relation to this well-being goal, active travel links will need to connect the population with employment opportunities and provide an attractive alternative to car travel. It is likely the majority of journeys to work will be beyond the distance that can be travelled solely by active travel modes. In terms of access to employment, there will need to be a focus upon improving links to public transport interchanges (e.g. Penarth Station) to enable onward journeys by public transport. - Carbon reduction benefits will only be realised when a significant modal shift from car travel to walking and cycling occurs – will require long term behaviour change to realise maximum impact.	++
A resilient Wales	- The provision of a network of Active Travel routes along the Penarth Cardiff Barrage Corridor will contribute to social, economic and ecological resilience by providing opportunities to travel by walking and cycling for everyday journeys instead of by car.	- Environmental/ ecological considerations associated with the development and implementation of larger-scale schemes, i.e. Penarth Headland Link, including the potential future impacts of climate change.	++

Well-being Goal	Strengths and Opportunities	Weaknesses and Threats	Appraisal Scoring
A healthier Wales	- Provision of Active Travel infrastructure linking residential areas with key services and facilities provides healthy and active travel options for everyday journeys and provides easily accessible facilities that can be used for leisure and exercise. - There are high quality and well-used active travel links already in place within the study area e.g. Cardiff Bay Barrage, Pont-y-Werin – potential to build upon the success of these existing links and encourage longer and more frequent journeys by walking and cycling if the network of links was expanded. - Provision of a network of Active Travel links has the opportunity to encourage long-term behaviour change and more active lifestyles, with previous research having linked active travel with both physical and mental health benefits.	- The quality of the active travel improvements that are provided will need to be 'accessible to all' to encourage large numbers of the population to choose walking and cycling as an everyday travel option. - The topography of the Penarth area will act as a constraint to the accessibility of certain Active Travel links to all users – associated measures such as the provision of electric bikes could assist in increasing usage. - To encourage users, the routes should be of the same quality for the duration of the link.	+++
A more equal Wales	- An improved active travel network will improve opportunities for everyday journeys by walking and cycling and benefit those without access to a car and/or those that cannot or choose not to use public transport. - Active travel improvements that link to public transport interchanges (e.g. Penarth Station) will improve access to wider opportunities for those without access to a car e.g. access to employment, training and education.	- The quality of the active travel improvements that are provided will need to be 'accessible to all' to encourage large numbers of the population to choose walking and cycling as an everyday travel option. - The topography of the Penarth area will act as a constraint to the accessibility of certain Active Travel links to all users – associated measures such as the provision of electric bikes could assist in increasing usage.	++
A Wales of cohesive communities	- A network of active travel improvements will contribute to safe and well-connected communities by providing opportunities for direct and accessible journeys by walking and cycling. - The proposed improvements aim to link residential areas with key services and facilities within Penarth town centre, along the Penarth Cardiff Barrage Corridor and join up with existing Active Travel routes, e.g. Cardiff Barrage, Pont-y-Werin, Railway Walk. The proposals also aim to support longer journeys by improving the walking and cycling links to stations within the study area.	- The constraints of the built environment will limit the extent of the off-road cycling improvements that can be provided – the design of improved on-road connections will need careful consideration to encourage use by less-confident cyclists. - The gradient of some proposed links within Penarth will act as a constraint to the accessibility of certain Active Travel links to all users – associated measures such as the provision of electric bikes could assist in increasing usage. - To reach their full potential, routes will have to be carefully considered to follow the desire lines of pedestrians and cyclists, to reduce severance between communities.	++

Well-being Goal	Strengths and Opportunities	Weaknesses and Threats	Appraisal Scoring
A Wales of vibrant culture and thriving Welsh language	- Improved active travel links along the Penarth Cardiff Barrage Corridor will encourage participation in sports and recreation (i.e. walking and cycling). - Active travel links will be improved to destinations promoting culture and heritage e.g. Cardiff Bay. - Active Travel signage will be in line with the Welsh Language Standards.	- None identified.	+
A globally responsible Wales	- Active Travel improvements aim to encourage more journeys by walking and cycling and less journeys by car. This change in travel behaviour will have carbon reduction benefits and make a positive contribution by global wellbeing.	- Carbon reduction benefits will only be realised when a significant modal shift from car travel to walking and cycling occurs – will require long term behaviour change to realise maximum impact.	++

Option 2 – Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

Well-being Goal	Strengths and Opportunities	Weaknesses and Threats	Appraisal Scoring
A prosperous Wales	- A bus park and ride/ bus priority scheme along the Penarth Cardiff Barrage Corridor will provide an alternative to car travel for journeys from the study area to Cardiff Bay and Cardiff City Centre, including commuting journeys. - The proposal uses existing infrastructure (Cardiff Barrage) to improve public transport access along the Penarth Cardiff Barrage Corridor. - The proposal encourages a reduction in car use and greater public transport use for journeys along the corridor, as the journey becomes more attractive due to utilising a congestion-free route across the Barrage (as opposed to via Windsor Road/Barons Court) - The proposal links to employment areas within Cardiff City Centre and improves access to employment from Cosmeston/ Penarth.	- Location of the proposed park and ride facility will act as a constraint to the number of users of the facility as it will mainly attract users from the Cosmeston, Sully and Lower Penarth catchment area. - Existing problems of traffic congestion in Penarth town centre and Cardiff city centre will reduce the attractiveness of this option as it will this will limit the journey time savings of the route. - The operational requirements of Cardiff Barrage limit the frequency of the bus service that can be provided. - A shift from existing public transport services onto the new route may limit the viability/frequency of these between the study area and Cardiff.	+
A resilient Wales	- The option supports social and economic resilience by providing improved options for travel by public transport and encouraging a reduction in car use for journeys into Cardiff, should a modal shift be successful.	- Any potential environmental/ ecological/ heritage impact of the location of the park and ride site at Cosmeston Lakes Country Park and the bus route over Cardiff Barrage will need careful consideration during scheme development.	+
A healthier Wales	- Users of the park and ride facility will be required to undertake a walking trip to reach their destination in Cardiff, which will have health benefits. - The new bus park and ride facility will include secure cycle storage, which may encourage users to travel to the facility by bike.	- Bus users in the Cosmeston and Lower Penarth area that previously walked to a bus stop may be encouraged to instead drive to the park and ride facility, which would have a negative health impact. - A bus route over Cardiff Barrage may reduce the attractiveness of the existing walking and cycling route over the barrage.	0

Well-being Goal	Strengths and Opportunities	Weaknesses and Threats	Appraisal Scoring
A more equal Wales	- The proposed bus service would provide a more frequent and direct public transport option for trips between the study area and Cardiff Bay, which would have benefits for those without access to a car. - The proposal will provide a direct public transport link between leisure and tourism destinations i.e. Cosmeston Lakes Country Park and Cardiff Bay. - The option has the potential to attract new walking and cycle trips to the park and ride facility – the facility would need to include safe cycle parking within its design.	- The planning of the park and ride service would need to ensure that the new service is not to the detriment of existing bus services that may be relied upon by users without access to a car. - A bus route over Cardiff Barrage may reduce the attractiveness of the existing walking and cycling route over the barrage.	+
A Wales of cohesive communities	- The proposed bus service would provide a direct public transport option for trips between the study area and Cardiff Bay. - The proposal will provide a direct public transport link between leisure and tourism destinations i.e. Cosmeston Lakes Country Park and Cardiff Bay.	- A bus route over Cardiff Barrage may reduce the attractiveness of the existing walking and cycling route over the barrage. - The constraints of the built environment in Penarth limits the extent of bus priority measures that can be provided along the route – this will impact on the journey time savings of the bus service and the potential attractiveness of bus travel in comparison to the journey by car. - The planning of the park and ride service would need to ensure that the new service is not to the detriment of existing bus services.	+
A Wales of vibrant culture and thriving Welsh language	- The new bus service would improve access by public transport to destinations that promote culture and heritage e.g. Cardiff Bay, Cosmeston Lakes Country Park. - Signage and information provided as part of the option will be in line with the Welsh Language Standards.	- Any potential negative impacts of the location of the park and ride site at Cosmeston Lakes Country Park and the bus route over Cardiff Barrage will need careful consideration during scheme development. - The service will need careful planning as to not act as a detriment to the other services currently operating in the area.	0
A globally responsible Wales	- The option aims to encourage car users to switch to public transport for part of their journey and reduce car trips into Cardiff, which would have carbon reduction and air quality benefits.	- Location of the proposed park and ride facility will act as a constraint to the number of users of the facility as it will mainly attract users from the Sully and Lower Penarth catchment area – overall benefits to modal shift and carbon reduction will be limited.	+

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange

Well-being Goal	Strengths and Opportunities	Weaknesses and Threats	Appraisal Scoring
A prosperous Wales	- Improved opportunities for interchange at Cogan station (i.e. by car, bus, walking and cycling) will encourage greater rail use and may encourage journeys to be made by rail instead of by car, including for commuting journeys. - Vacant land available on the site that presents a regeneration opportunity. Public sector investment in the area may encourage private investment. - The proposal makes use of an existing frequent rail service (currently a 15-minute service frequency Monday to Saturday).	- Increased parking availability at Cogan Station could increase existing congestion on the A4160 Cogan Hill/ Windsor Road and at the Barons Court junction. - Increased park and ride provision could encourage rail users that previously walked to the station to instead drive to the park and ride facility, which could have a negative impact on congestion.	+
A resilient Wales	- The option supports social and economic resilience by providing improved options for travel by public transport and encouraging a reduction in car use for journeys into Cardiff. The inclusion of improved cycle parking facilities helps to support this goal.	- Any potential environmental/ ecological impacts of the proposed development will need consideration during scheme development e.g. air quality impacts due to the previously designated AQMA on Windsor Road.	+
A healthier Wales	- Provision of improved Active Travel infrastructure linking to and within Cogan Station would encourage more walking and cycling trips to the station, which would have a positive health benefit. - A journey undertaken by train as opposed to by car is likely to incorporate an active travel element from the station closest to the destination.	- Provision of an expanded park and ride facility at the station could encourage rail users that previously travelled to the station by sustainable modes to drive to the park and ride facility, which would have a negative health impact. - An Air Quality Management Area has previously been in place along a section of Windsor Road – need to ensure the proposal would not have a negative impact on local air quality as this would have a negative health impact.	+
A more equal Wales	- Improvements to Cogan Station could benefits existing and new rail users that do not have access to a car e.g. improvements to walking links to bus stops and Active Travel infrastructure. - Accessibility improvements at Cogan Station, e.g. provision of an 'Access for All' bridge over the railway line, will improve access for pedestrians and those with restricted mobility - could benefit users of the Well-being Hub being proposed close to the station site.	- Consideration should be given to the impact of an increase in parking provision at Cogan station on traffic volumes/ congestion on the local highway network e.g. Windsor Road (A4160), Barons Court junction – could impact on the reliability of existing bus services.	+

Well-being Goal	Strengths and Opportunities	Weaknesses and Threats	Appraisal Scoring
A Wales of cohesive communities	- Improvements to Active Travel links to and within Cogan Station will contribute to safe and well-connected communities. - Improved opportunities for interchange between modes (e.g. rail park and ride and Active Travel infrastructure) will improve connectivity between communities. - Improvements to station accessibility, particularly to the northbound platform via an 'Access for All' bridge, will allow those with restricted mobility to use the station.	- Increased parking availability at Cogan Station could increase existing congestion on the A4160 Cogan Hill/ Windsor Road and at the Barons Court junction.	++
A Wales of vibrant culture and thriving Welsh language	- Signage and information provided as part of the option will be in line with the Welsh Language Standard.	- None identified.	0
A globally responsible Wales	- The option aims to encourage car users to switch to public transport for part of their journey and reduce car trips into Cardiff, which would have carbon reduction and air quality benefits.	- The location of Cogan Station and the existing congestion issues affecting the local highway network e.g. further development at this location could have a negative impact upon congestion and air quality.	+

Welsh Government's Well-being Objectives as outlined in 'Prosperity for All: The National Strategy'

The following 3 tables provide an assessment of how each shortlisted option fits with the Welsh Government's well-being objectives as detailed in 'Prosperity for All: The National Strategy'.

Option 1 – Active Travel proposals for the Penarth Cardiff Barrage Corridor

'Prosperity for All' key theme	Well-being objectives	How the option fits with the Welsh Government's Well-being Objectives	Appraisal Score
Prosperous and secure	Support people and business to drive prosperity	Active travel improvements will increase the sustainable travel to work options for local communities and improve access to employment opportunities.	+
	Tackle regional inequality and promote fair work	Active travel improvements will increase the sustainable travel to work options for local communities and improve access to employment opportunities.	+
	Drive sustainable growth and combat climate change	Active travel improvements will provide opportunities for travel by non-motorised modes along the Penarth Cardiff Barrage Corridor and contribute to a low carbon society by providing opportunities for walking and cycling for everyday journeys.	++
Healthy and Active	Deliver quality health and care services fit for the future	N/A to option.	0
	Promote good health and well-being for everyone	Active travel improvements provide opportunities for more walking and cycling for everyday journeys and for more physically active lifestyles generally, which has a positive impact on health and well-being.	+++
	Build healthier communities and better environment	Provision of a network of Active Travel links has the opportunity to encourage long-term behaviour change and more active lifestyles, which contributes to building healthier communities.	++
Ambitious and Learning	Support young people to make the most of their potential	Active travel infrastructure provides low-cost travel options (i.e. walking and cycling) for accessing services and facilities (including schools), which will benefit young people and help in developing active lifestyles for the future.	+
	Build ambition and encourage learning for life	N/A to option.	0

'Prosperity for All' key theme	Well-being objectives	How the option fits with the Welsh Government's Well-being Objectives	Appraisal Score
	Equip everyone with the right skills for a changing world	N/A to option.	0
United and Connected	Build resilient communities, culture and language	A network of Active Travel routes will improve linkages within communities and to community facilities and support better health and well-being by encouraging more walking and cycling.	+
	Deliver modern and connected infrastructure	The delivery of high-quality transport infrastructure is central to this well-being goal. The provision of a network of Active Travel routes to encourage more walking and cycling will contribute to the aims of reducing carbon emissions, reducing congestion and promoting Active Travel.	++
	Promote and protect Wales' place in the world	High quality Active Travel infrastructure could have positive leisure and tourism benefits e.g. the PHL.	+

Option 2 – Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

'Prosperity for All' key theme	**Well-being objectives**	**How the option fits with the Welsh Government's Well-being Objectives**	**Appraisal Scoring**
Prosperous and secure	Support people and business to drive prosperity	A bus park and ride/ bus priority scheme will provide an alternative to car travel for commuting journeys from the study area to Cardiff Bay and Cardiff City Centre, which will aim to remove car trips from the congested highway network e.g. the Barons Court junction.	+
	Tackle regional inequality and promote fair work	The option aims to improve access to employment in Cardiff Bay and Cardiff City Centre by sustainable transport modes, although the location of the proposal will act as a constraint and limit its positive impact.	+
	Drive sustainable growth and combat climate change	The option aims to encourage car users to switch to public transport for part of their journey and reduce car trips into Cardiff, which would have carbon reduction and air quality benefits.	+
Healthy and Active	Deliver quality health and care services fit for the future	N/A to option.	0
	Promote good health and well-being for everyone	The option contributes to the provision of an integrated public transport network that encourages people to combine different types of transport with walking and cycling e.g. users of the park and ride will be required to undertake a walking trip to reach their destination in Cardiff, the bus park and ride facility includes provision of secure cycle storage. The proposal could reduce the attractiveness of the existing walking and cycling route over Cardiff Barrage.	0
	Build healthier communities and better environment	The proposal could reduce the attractiveness of the existing walking and cycling route over Cardiff Barrage. There would be environmental and heritage considerations due to the proposed location of the Park and Ride at Cosmeston Lakes Country Park, which is an important visitor attraction.	-
Ambitious and Learning	Support young people to make the most of their potential	The proposal could potentially improve access to jobs for some young people, although the overall impact is considered to be limited.	0

	Build ambition and encourage learning for life	N/A to option.	0
	Equip everyone with the right skills for a changing world	N/A to option.	0
United and Connected	Build resilient communities, culture and language	The proposal could reduce the attractiveness of existing community facilities, which could have a negative impact on health and well-being e.g. the existing walking and cycling route on Cardiff Barrage, Cosmeston Lakes Country Park.	-
	Deliver modern and connected infrastructure	The delivery of high-quality transport infrastructure is central to this well-being goal. The proposal will contribute to the provision of an integrated public transport network and improve sustainable transport options for local communities e.g. to Cardiff Bay.	+
	Promote and protect Wales' place in the world	The introduction of buses onto Cardiff Barrage could have a negative impact on the existing walking and cycling route, which is an important visitor and tourist attraction.	-

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange

'Prosperity for All' key theme	**Well-being objectives**	**How the option fits with the Welsh Government's Well-being Objectives**	**Appraisal Scoring**
Prosperous and secure	Support people and business to drive prosperity	The Cogan Interchange proposal will provide an alternative to car travel for commuting journeys from the study area to Cardiff City Centre, which will aim to remove car trips from the congested highway network.	+
	Tackle regional inequality and promote fair work	The option aims to improve access to employment in Cardiff City Centre by sustainable transport modes.	+
	Drive sustainable growth and combat climate change	The option aims to encourage car users to switch to public transport for part of their journey and reduce car trips into Cardiff, which would have carbon reduction and air quality benefits.	+
Healthy and Active	Deliver quality health and care services fit for the future	N/A to option.	0
	Promote good health and well-being for everyone	The option contributes to the provision of an integrated public transport network that encourages people to combine different types of transport with walking and cycling e.g. Active Travel improvements to Cogan Station are included within the proposal, users of the park and ride will be required to undertake a walking trip to reach their destination in Cardiff and the proposal includes provision of secure cycle storage.	+
	Build healthier communities and better environment	The proposal includes Active Travel improvements that could encourage more active lifestyles, although an expanded Park and Ride facility could also encourage rail users to drive to the station instead of walking or cycling. The proposed accessibility improvements to Cogan Station (e.g. Access for All bridge) would improve access to the rail network for users of Cogan Leisure Centre and the proposed Well-being Hub. The potential impact of the proposal on local air quality would need to be considered due to there previously being an AQMA on Windsor Road.	0
Ambitious and Learning	Support young people to make the most of their potential	The proposal could potentially improve access to jobs for some young people, although the overall impact considered to be limited.	0

	Build ambition and encourage learning for life	N/A to option	0
	Equip everyone with the right skills for a changing world	N/A to option	0
United and Connected	Build resilient communities, culture and language	Improvements to Active Travel infrastructure at Cogan Station will improve linkages to community facilities and support better health and well-being by encouraging more walking and cycling. Overall impact considered to be limited.	0
	Deliver modern and connected infrastructure	The delivery of high-quality transport infrastructure including delivery of the South Wales Metro is central to this well-being goal. The proposal will contribute to the provision of an integrated public transport network and improve sustainable transport options for local communities e.g. commuting journeys to Cardiff.	++
	Promote and protect Wales' place in the world	Overall impact considered to be limited e.g. to tourism.	0

Vale of Glamorgan Council and Vale of Glamorgan's Public Services Board Well-being Objectives

The following 3 tables provide an assessment of how each shortlisted option fits with the well-being objectives of Vale of Glamorgan Council and the Vale of Glamorgan's Public Services Board.

Option 1 – Active Travel proposals for the Penarth Cardiff Barrage Corridor

Organisation	Well-being objective	How the option fits with the well-being objective	Appraisal Scoring
Vale of Glamorgan Council Well-being Objectives	An Inclusive and Safe Vale	An increase in facilities and infrastructure relating to Active Travel supports this objective by increasing the opportunities for physical exercise and reducing the reliance on the private car in favour of more cost-effective modes. The provision of improved Active Travel infrastructure increases options for low-cost, sustainable travel options for local communities.	++
	An Environmentally Responsible and Prosperous Vale	The provision of a network of Active Travel routes aims to provide sustainable travel options for everyday journeys and provide an attractive alternative to car travel. The proposal directly achieves improvements in line with the Vale of Glamorgan's Corporate Plan to 'continue to improve the Active Travel Highway Network'. The option may also help to reduce emissions as more attractive active and sustainable transport options become available. Routes such as the PHL also have potential to contribute to enhancing the tourism offer.	++
	An Aspirational and Culturally Vibrant Vale	This option seeks to support Vale residents achieve their full potential by improving access to places of education, employment and services by providing safe access through low-cost and sustainable modes of transport i.e. walking and cycling. High quality Active Travel infrastructure could have positive leisure and tourism benefits e.g. the PHL.	+
	An Active and Healthy Vale	The provision of improved Active Travel infrastructure supports increased levels of physical activity by providing more opportunities to safely walk and cycle for everyday journeys. The option also supports the work of the Cardiff and Vale Health and Well-being Board to reduce levels of obesity and encourage healthier lifestyles. Provision of a network of Active Travel links has the opportunity to encourage long-term behaviour change and more active lifestyles, with previous research having linked active travel with both physical and mental health benefits.	++

Vale of Glamorgan's Public Service Board's Well-being Plan	To enable people to get involved, participate in their local communities and shape local services	Public involvement has been important in the development of options at WelTAG Stages One and Two, which have included two public consultation events and a six-week period of public consultation. Overall impact considered to be limited.	0
	To reduce poverty and tackle inequalities linked to deprivation	An improved Active Travel network will improve transport options for those without access to a car and/or those that cannot or choose not to use public transport. The Active Travel improvements will improve access to services and facilities by walking and cycling, which is a low-cost travel option.	++
	To give children the best start in life	Active travel infrastructure provides low-cost travel options (i.e. walking and cycling) for accessing services and facilities (including schools), which will benefit young people and help in developing active lifestyles for the future.	+
	To protect, enhance and value the environment	The option seeks to encourage a modal shift away from the private vehicle to active, non-polluting modes of travel, which aims to protect, enhance and value the environment. There will be environmental/ ecological considerations associated with the development and implementation of larger-scale schemes i.e. the PHL.	++

Option 2 – Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage

Organisation	Well-being objective	How the option fits with the well-being objective	Appraisal Scoring
Vale of Glamorgan Council Well-being Objectives	An Inclusive and Safe Vale	The option improves sustainable travel options for local communities for everyday journeys e.g. commuting into Cardiff. The proposal includes the provision of secure cycle storage and CCTV at the Park and Ride facility. The proposal to introduce buses onto Cardiff Barrage may reduce the perceived safety of the existing walking and cycling route.	+
	An Environmentally Responsible and Prosperous Vale	A bus park and ride/ bus priority scheme will provide an alternative to car travel for commuting journeys from the study area to Cardiff Bay and Cardiff City Centre, which will aim to remove car trips from the congested highway network e.g. the Barons Court junction. This directly links to the Vale's Corporate Plan Priority to 'improve accessibility to public transport'. Any potential environmental/ ecological/ heritage impact of the location of the park and ride site at Cosmeston Lakes Country Park and the bus route over Cardiff Barrage will need careful consideration during scheme development.	+
	An Aspirational and Culturally Vibrant Vale	The proposal will improve the attractiveness of sustainable transport options for local communities and improve access to employment, education, services and facilities e.g. in Cardiff Bay and Cardiff City Centre. The proposal could reduce the attractiveness of the existing walking and cycling route over Cardiff Barrage.	+
	An Active and Healthy Vale	The option contributes to the provision of an integrated public transport network that encourages people to combine different types of transport with walking and cycling e.g. users of the park and ride will be required to undertake a walking trip to reach their destination in Cardiff and the bus park and ride facility includes provision of secure cycle storage. The proposal could reduce the attractiveness of the existing walking and cycling route over Cardiff Barrage.	0

Vale of Glamorgan's Public Service Board's Well-being Plan	To enable people to get involved, participate in their local communities and shape local services	Public involvement has been important in the development of options at WelTAG Stages One and Two, which have included two public consultation events and a six-week period of public consultation. Overall impact considered to be limited.	0
	To reduce poverty and tackle inequalities linked to deprivation	The proposed bus service would provide a more frequent and direct public transport option for trips between the study area and Cardiff Bay, which would have benefits for those without access to a car. The proposal will provide a direct public transport link between leisure and tourism destinations i.e. Cosmeston Lakes Country Park and Cardiff Bay. The planning of the park and ride service would need to ensure that the new service is not to the detriment of existing bus services that may be relied upon by users without access to a car.	+
	To give children the best start in life	The proposal could potentially improve access to services and facilities for some young people, although the overall impact is considered to be limited.	0
	To protect, enhance and value the environment	The option aims to encourage car users to switch to public transport for part of their journey and reduce car trips into Cardiff, which would have carbon reduction benefits. However, the location of the proposed Park and Ride at Cosmeston Lakes Country Park and the proposed bus route over Cardiff Barrage could negatively impact two important visitor attractions. Any potential environmental/ ecological/ heritage impacts of the location of the park and ride site at Cosmeston Lakes Country Park and the bus route over Cardiff Barrage will need careful consideration during scheme development.	-

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange

Organisation	Well-being objective	How the option fits with the well-being objective	Appraisal Scoring
Vale of Glamorgan Council Well-being Objectives	An Inclusive and Safe Vale	The option improves sustainable travel options for local communities for everyday journeys e.g. commuting into Cardiff. The proposal includes the provision of secure cycle storage and CCTV at the Park and Ride facility.	+
	An Environmentally Responsible and Prosperous Vale	The Cogan Interchange proposal aims to provide an alternative to car travel for commuting journeys from the study area to Cardiff City Centre, which will aim to remove car trips from the congested highway network. There is vacant land available on the site that presents a regeneration opportunity. The option aims to encourage car users to switch to public transport for part of their journey and reduce car trips into Cardiff, which would have carbon reduction and air quality benefits.	++
	An Aspirational and Culturally Vibrant Vale	The proposal will improve the attractiveness of sustainable transport options for local communities and improve access by rail to employment, education, services and facilities e.g. in Cardiff City Centre.	+
	An Active and Healthy Vale	The option contributes to the provision of an integrated public transport network that encourages people to combine different types of transport with walking and cycling e.g. Active Travel improvements to Cogan Station are included within the proposal, users of the park and ride will be required to undertake a walking trip to reach their destination in Cardiff and the proposal includes provision of secure cycle storage.	+

Vale of Glamorgan's Public Services Board's Well-being Objectives	To enable people to get involved, participate in their local communities and shape local services	Public involvement has been important in the development of options at WelTAG Stages One and Two, which have included two public consultation events and a six-week period of public consultation. Overall impact considered to be limited.	0
	To reduce poverty and tackle inequalities linked to deprivation	Improvements to Cogan Station could benefits existing and new rail users that do not have access to a car e.g. improvements to walking links to bus stops and Active Travel infrastructure. Accessibility improvements at Cogan Station, e.g. provision of an 'Access for All' bridge over the railway line, will improve access for pedestrians and those with restricted mobility - could benefit users of the Well-being Hub being proposed close to the station site.	+
	To give children the best start in life	The proposal could potentially improve access to services and facilities for some young people, although the overall impact considered to be limited.	0
	To protect, enhance and value the environment	The option aims to encourage car users to switch to public transport for part of their journey and reduce car trips into Cardiff, which would have carbon reduction benefits. Proposals to improve Active Travel infrastructure at Cogan Station would also help to support this aim. The proposal would redevelop an area of derelict land, which would have regeneration benefits.	+

Appendix 20 Preliminary Cost Estimates Developed to Support WelTAG Stage Two

Preliminary cost estimates developed to support WelTAG Stage Two (July 2019)

Option 1 - Active Travel proposals for the Penarth Cardiff Barrage Corridor (cost estimate does not include PHL)

Cost estimate includes:

- Network of Active Travel routes (not including PHL) as detailed in Section 2.7 of WelTAG Stage Two report and Appendix 10 of the IAR. The cost of a proposed 20mph limit is excluded from the cost at this stage as an area for the 20mph limit has yet to be defined.

Description	Cost estimate (£)
Construction cost estimate	375,432
Optimum bias (44%)	165,191
Total	540,623

Notes to accompany cost estimate:

- Construction cost estimate only – no contingency included for design fees or costs for statutory processes e.g. TROs.
- Estimate makes no allowance for land costs, ground conditions/ contamination or statutory undertakers equipment (existing or proposed).
- Includes 44% optimism bias due to early design stage.

Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage (cost estimate does not include bus route over Cardiff Barrage)

Cost estimate includes:

- Approximately 150 park and ride spaces and includes lighting, CCTV and electric vehicle charging infrastructure (10% of spaces),
- Internal access improvements into the site to accommodate bus access and turning area,
- A covered waiting area and ticket machine,
- Secure cycle storage,
- SUDs requirements, and
- Carriageway realignment at the Paget Road/ Paget Terrace junction.

Description	Cost estimate (£)
Construction Sub-Total	3,673,077
Preliminaries (21%)	771,346
Construction Total	4,444,423
Optimum bias (44%)	1,955,546
Total	6,399,969

Notes to accompany cost estimate:

- Construction cost estimate only – no contingency included for design fees.
- Estimate makes no allowance for land costs, ground conditions/ contamination or statutory undertakers equipment (existing or proposed).
- Includes 44% optimism bias due to early design stage.

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange

Cost estimate includes:

- The development of vacant land to provide an expanded park and ride facility with approximately 140 spaces and includes lighting, CCTV, electric vehicle charging infrastructure (10% of spaces) and SUDs requirements,
- Provision of 10 disabled spaces and taxi/drop-off area,
- On-station improvements including an Access for All bridge over the rail line, ticket machine, toilets and new shelters.
- Improvements to existing highway access onto the site from A160 Windsor Road
- Covered/secure cycle storage.
- Active Travel improvements into the site i.e. segregated pedestrian footway into the site from main Windsor Road access, improvements to pedestrian routes to nearby bus stops to south of the site, improvements to existing Cogan Hill roundabout crossing point.

Description	**Cost estimate (£)**
Construction Sub-Total	3,720,640
Preliminaries (21%)	781,334
Construction Total	4,501,974
Optimum bias (44%)	1,980,869
Total	6,482,843

Notes to accompany cost estimate:

- Construction cost estimate only – no contingency included for design fees.
- Estimate makes no allowance for land costs, ground conditions/ contamination or statutory undertakers equipment (existing or proposed).
- Includes 44% optimism bias due to early design stage.

Appendix 21 WebTAG Appraisal Sheets

WebTAG Appraisal Sheets

Option 1 Active Travel (without PHL)

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 205,741	*(15)*
Physical Activity	£ 1,370,600	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 519,838	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers		*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 2,096,179	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 317,144	*(10)*
Present Value of Costs (see notes) (PVC)	£ 317,144	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£ 1,779,035	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	6.61	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 519,837.87		£ 519,838			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 519,837.87	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue								
Operating costs								
Investment costs								
Grant/subsidy								
Subtotal	£ -	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ -	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 519,838	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ -					
Investment Costs	£ 493,132					£ 493,132
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 317,144	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 317,144	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel (with PHL) Adjusted BCR High Cost

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 16,100,100	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 1,085,616	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ 9,816,757	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 27,879,780	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 11,785,322	*(10)*
Present Value of Costs (see notes) (PVC)	£ 11,785,322	*(PVC) = (10)*

OVERALL IMPACTS

Net Present Value (NPV)	£ 16,094,458	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	2.37	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 1,085,616.17		£ 1,085,616			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 1,085,616.17	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ 9,816,757							£ 9,816,757
Operating costs	£ -							
Investment costs	£ -							
Grant/subsidy	£ -							
Subtotal	£ 9,816,757	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ 9,816,757	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 10,902,373	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 1,527,316					£ 1,527,316
Investment Costs	£ 10,433,994					£ 10,433,994
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 11,785,322	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 11,785,322	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel (with PHL) Adjusted BCR High Cost 50%

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 12,878,022	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 974,054	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ 7,881,059	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 22,610,442	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 11,785,322	*(10)*
Present Value of Costs (see notes) (PVC)	£ 11,785,322	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£ 10,825,119	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.92	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 974,054.25		£ 974,054			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 974,054.25	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ 7,881,059							£ 7,881,059
Operating costs	£ -							
Investment costs	£ -							
Grant/subsidy	£ -							
Subtotal	£ 7,881,059	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ 7,881,059	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 8,855,113	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 1,527,316					£ 1,527,316
Investment Costs	£ 10,433,994					£ 10,433,994
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 11,785,322	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 11,785,322	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel (with PHL) Adjusted BCR Low Cost

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 16,100,100	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 1,085,616	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ 9,816,757	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 27,879,780	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 7,229,573	*(10)*
Present Value of Costs (see notes) (PVC)	£ 7,229,573	*(PVC) = (10)*

OVERALL IMPACTS

Net Present Value (NPV)	£ 20,650,208	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	3.86	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 1,085,616.17		£ 1,085,616			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 1,085,616.17	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ 9,816,757							£ 9,816,757
Operating costs	£ -							
Investment costs	£ -							
Grant/subsidy	£ -							
Subtotal	£ 9,816,757	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ 9,816,757	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 10,902,373	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 920,070					£ 920,070
Investment Costs	£ 6,485,491					£ 6,485,491
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 7,229,573	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 7,229,573	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel (with PHL) Adjusted BCR
Low Cost 50%

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 12,878,022	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 974,054	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ 7,881,059	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 22,610,442	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 7,229,573	*(10)*
Present Value of Costs (see notes) (PVC)	£ 7,229,573	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£ 15,380,869	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	3.13	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 974,054.25		£ 974,054			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 974,054.25	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ 7,881,059							£ 7,881,059
Operating costs	£ -							
Investment costs	£ -							
Grant/subsidy	£ -							
Subtotal	£ 7,881,059	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ 7,881,059	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 8,855,113	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 920,070					£ 920,070
Investment Costs	£ 6,485,491					£ 6,485,491
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 7,229,573	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 7,229,573	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel PHL Not Adjusted BCR High Cost

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 16,100,100	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 1,085,616	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ -	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 18,063,023	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 11,785,322	*(10)*
Present Value of Costs (see notes) (PVC)	£ 11,785,322	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£ 6,277,701	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.53	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 1,085,616.17		£ 1,085,616			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 1,085,616.17	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business							
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**
Travel time							
Vehicle operating costs							
User charges							
During Construction & Maintenance							
Subtotal	£ -	*(2)*					

Private sector provider impacts			**Freight**	**Passengers**
Revenue	£ -			
Operating costs	£ -			
Investment costs	£ -			
Grant/subsidy	£ -			
Subtotal	£ -	*(3)*		

Other business impacts					
Developer contributions	£ -	*(4)*			
NET BUSINESS IMPACT	£ -	*(5) = (2) + (3) + (4)*			

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 1,085,616	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 1,527,316					£ 1,527,316
Investment Costs	£ 10,433,994					£ 10,433,994
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 11,785,322	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 11,785,322	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel PHL Not Adjusted BCR High Cost 50%

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 12,878,022	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 974,054	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ -	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 14,729,383	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 11,785,322	*(10)*
Present Value of Costs (see notes) (PVC)	£ 11,785,322	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£ 2,944,061	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.25	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 974,054.25		£ 974,054			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 974,054.25	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ -							
Operating costs	£ -							
Investment costs	£ -							
Grant/subsidy	£ -							
Subtotal	£ -	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ -	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 974,054	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 1,527,316					£ 1,527,316
Investment Costs	£ 10,433,994					£ 10,433,994
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 11,785,322	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 11,785,322	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel PHL Not Adjusted BCR Low Cost

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 16,100,100	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 1,085,616	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ -	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 18,063,023	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 7,229,573	*(10)*
Present Value of Costs (see notes) (PVC)	£ 7,229,573	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£ 10,833,450	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	2.50	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 1,085,616.17		£ 1,085,616			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 1,085,616.17	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ -							
Operating costs	£ -							
Investment costs	£ -							
Grant/subsidy	£ -							
Subtotal	£ -	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ -	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 1,085,616	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 920,070					£ 920,070
Investment Costs	£ 6,485,491					£ 6,485,491
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 7,229,573	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 7,229,573	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 1 Active Travel PHL Not Adjusted BCR Low Cost 50%

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality	£ 877,307	*(15)*
Physical Activity	£ 12,878,022	*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 974,054	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ -	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 14,729,383	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 7,229,573	*(10)*
Present Value of Costs (see notes) (PVC)	£ 7,229,573	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£ 7,499,810	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	2.04	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 974,054.25		£ 974,054			
User charges	£ -					
During Construction & Maintenance	£ -					
COMMUTING	£ 974,054.25	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ -							
Operating costs	£ -							
Investment costs	£ -							
Grant/subsidy	£ -							
Subtotal	£ -	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ -	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 974,054	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 920,070					£ 920,070
Investment Costs	£ 6,485,491					£ 6,485,491
Developer and Other Contributions	-£ 175,988					-£ 175,988
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 7,229,573	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 7,229,573	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 2 Park and Ride Appraisal (Total)

Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£ 7,231,188	*(1a)*
Economic Efficiency: Consumer Users (Other)		*(1b)*
Economic Efficiency: Business Users and Providers	£ 1,968,199	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£ -	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£ 9,199,387	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£ 36,550,256	*(10)*
Present Value of Costs (see notes) (PVC)	£ 36,550,256	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	-£ 27,350,869	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.25	BCR=PVB/PVC

Note : 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)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 6,712,623.33		£ 6,712,623			
User charges	£ 518,564.98		£ 2,486,764	-£ 1,968,199		
During Construction & Maintenance	£ -					
COMMUTING	£ 7,231,188.30	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business							
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**
Travel time							
Vehicle operating costs							
User charges							
During Construction & Maintenance							
Subtotal	£ -	*(2)*					
Private sector provider impacts						**Freight**	**Passengers**
Revenue	£ 1,968,199				£ 1,968,199		
Operating costs							
Investment costs							
Grant/subsidy							
Subtotal	£ 1,968,199	*(3)*					
Other business impacts							
Developer contributions	£ -	*(4)*					
NET BUSINESS IMPACT	£ 1,968,199	*(5) = (2) + (3) + (4)*					

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 9,199,387	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 30,659,807			£ 30,659,807		
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 30,659,807	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ 5,890,449			£ 5,890,449		
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 5,890,449	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues		*(9)*				
TOTALS						
Broad Transport Budget	£ 36,550,256	*(10) = (7) + (8)*				
Wider Public Finances		*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Option 3 Cogan Interchange

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 584,871		£ 584,871			
Investment Costs	£ 3,803,011					£ 3,803,011
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 4,387,882	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 4,387,882	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ -					
Vehicle operating costs	£ 7,487,462.10		£ 7,487,462			
User charges	£ 134,235.26		£ 4,726,988		-£ 4,592,752	
During Construction & Maintenance	£ -					
COMMUTING	£ 7,621,697	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time						
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ -	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time								
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ -	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£ 4,592,752						£ 4,592,752	
Operating costs								
Investment costs								
Grant/subsidy								
Subtotal	£ 4,592,752.41	*(3)*						
Other business impacts								
Developer contributions	£ -	*(4)*						
NET BUSINESS IMPACT	£ 4,592,752.41	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£ 12,214,450	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£ -					
Operating Costs	£ 584,871		£ 584,871			
Investment Costs	£ 3,803,011					£ 3,803,011
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ 4,387,882	*(7)*				
Central Government Funding: Transport						
Revenue	£ -					
Operating costs	£ -					
Investment Costs	£ -					
Developer and Other Contributions	£ -					
Grant/Subsidy Payments	£ -					
NET IMPACT	£ -	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	£ -	*(9)*				
TOTALS						
Broad Transport Budget	£ 4,387,882	*(10) = (7) + (8)*				
Wider Public Finances	£ -	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Appendix 22 Transport Case - Impact Assessment Tables

Option 1: Active Travel Proposals for Penarth Cardiff Barrage Corridor		
	Impacts	Scale
Economic		
Business Users & Reliability Impact	Option 1 is likely to have minimial impact on business users and reliability due to the relatively limited impact of the Active Travel proposals on reducing overall levels of traffic to the advantage of businesses.	0
Regeneration	The PHL proposal could contribute to regeneraton and redevelopment opportunities. An increase in Active Travel provision may lead to opportunities for regeneration as more of the public realm may be able to be dedicated to pedestrians and cyclists, as opposed to motor vehicles. (Suggestions were made at the WelTAG Stage One and Two public consultation events regarding the reallocation of road space to pedestrans and cyclists and for more of the Town Centre (particularly around Windsor Road) to become more pedestrian friendly, with car parking spaces removed to allow for events such as markets.)	+ +
Wider Impacts	The PHL could have wider leisure and tourism benefits. The network of Active Travel routes all link to Penarth town centre, which would benefit services and facilities within the town centre. Wider physical and health benefits to users of the Active Travel network, which has long-term economic benefits.	+ +
Environment		
Noise	If a modal shift is achieved, noise levels will be reduced as people switch to active modes which are generally quieter.	+
Air Quality	Active Travel proposals aim to increase levels of walking and cycling and contribute to reducing emissions. Air quality would be improved as people will be encouraged to switch from polluting modes to active ones.	+ +
Greenhouse Gases	Active Travel proposals aim to increase levels of walking and cycling, which are low carbon modes of travel. A positive contribution to emissions attributed to greenhouse gases will be achieved via a modal shift to unpolluting active modes.	+ +
Landscape	Option 1 is likely to have little impact on the landscape of the study area overall. The landscape impact of the PHL will need to be considered as the proposal is further developed.	0
Townscape	The Active Travel routes within the town centre aims to remove car trips within the town centre environment and encourage more walking ad cycling. The proposal includes the introduction of a 20mph limit in the town centre, which would improve the town centre environment for more vulnerable users.	+
Historic Landscape	Option 1 is likely to have very little impact on the historic landscape of the town.	0
Cultural Heritage	Active Travel proposals may have a small positive impact on the cultural heritage as communities will have improved walking and cycling connections between them.	+
Biodiversity	Option 1 is likely to have little impact on the biodiversity of the study area overall. The biodiversity impacts of the PHL will need to be considered as the proposal is further developed.	0
Water Environment	Option 1 is likely to have very little impact on the water environment of the study area. The water environment impacts of the PHL will need to be considered as the proposal is further developed.	0
Social and Cultural		
Commuting and Other Users	The Active Travel proposals aim to improve opportunities for walking and cycling for everyday journeys. The introduction of a bike hire scheme will also increase opportunities for cycling. The Active Travel proposals and the implementation of routes may encourage more people to commute via active modes. To a certain extent this is also reliant on third parties implementing measures to support commuting via active modes e.g. via workplace cycle parking and changing facilities. The focus on Active Travel routes to/from Cardiff Barrage and connections to rail stations supports encouraging a modal shift for commuters due to the high proportion of workers travelling from the Vale of Glamorgan to Cardiff for work.	+ +
Reliability Impact on Commuting and Other Users	Reliability is likely to improve as journey times by active modes are likely to be easier to predict and less reliant on other parameters e.g. timetables, traffic levels.	+
Physical Activity	Option 1 aims to improve opportunities for walking and cycling across the study area. The proposals will provide Active Travel facilities that encourage walking and cycling for leisure and recreation, as well as for utility journeys. An increase in levels of walking and cycling and a modal shift from sedentary to active modes will have a large benefit to levels of physical activity.	+ + +
Journey Quality	The Active Travel proposals aim to enhance journey quality for pedestrians and cyclists by providing improved Active Travel infrastructure. The PHL proposal will greatly improve the existing walking and cycling route between Cardiff Barrage and Penarth Esplanade. Studies have shown that a journey undertaken via active modes (particularly walking) leads to an improved journey satisfaction (De Vos et al., 2016).	+ +
Accidents	Improvements to the Active Travel environment in the study area includes proposed reductions in speed limits and provision for safer crossing facilities for pedestrians and cyclists. Therefore it is envisaged that the likelihood of accidents occuring would be reduced from the present situation.	+
Security	An uptake of walking and cycling is envisaged to slightly improve security in the study area due to an increase in surveillance from these modes. The proposals include provision of cycle stands at town centre locations to enable bikes to be stored securely.	+
Access to Services	Option 1 is likely to improve access to services by providing Active Travel routes that provide connections to key services and facilities in the study area e.g. Penarth town centre, rail stations, places of employment and education. The introduction of a bike hire scheme will also improve access to services.	+ +
Welsh Language	This option would not likely influence usage and/or uptake of the Welsh Language.	0
Tourism	The PHL could in particular have wider leisure and tourism benefits. Option 1 may improve the attractiveness of the study area to tourism, particularly if improved Active Travel links within the area encourage extended trips from tourists already using Cardiff Barrage, the Wales Coast Path and/or the Cardiff Bay Trail.	+ +
Affordability	The Transport Case economic assessment has shown that the lower cost Active Travel proposals represent high value for money. Further development of the PHL proposal would enable the scheme cost estimate and value for money assessment to be refined.	+
Severance	Severance is likely to be improved greatly as walking and cycling routes providing connections to services and facilities are implemented.	+ + +
Option Values	The option value of Option 1 is rated as slightly positive.	+

Option 2: Cosmeston Bus Park and Ride and Bus Priority Link across Cardiff Barrage		
	Impacts	Scale
Economic		
Business Users & Reliability Impact	This option is likely to have minimal impact on business users and reliability due to the focus of the Park and Ride service being commuters travelling between the Vale of Glamorgan and Cardiff and the relatively limited impact of the proposal on reducing traffic levels across the study area as a whole.	0
Regeneration	Option 2 is considered to have little impact on regeneration due to the nature and location of the proposal e.g. limited opportunities for associated regeneration opportunities.	0
Wider Impacts	No notable wider impacts have been identified e.g. although the bus route will connect two visitor attractions, the potential leisure and tourism impacts of the proposal are considered to be limited. The potential impact of the proposal on existing bus services would need to be considered e.g. the service operating across the Barrage may attract existing bus users and have a negative impact on the patronage and frequency of existing bus services between Penarth, Cogan, Grangetown and Cardiff.	0
Environment		
Noise	The proposal is considered to have a neutral impact overall on noise, although the location of the Park and Ride at Cosmeston and the running of bus services across the Barrage may result in localised increases in noise levels from traffic at certain locations across the proposed route.	0
Air Quality	The proposal is considered to have a neutral impact overall on air quality, due to the relatively limited impact of the proposal on reducing traffic levels across the study area.	0
Greenhouse Gases	A slight positive has been scored for greenhouse gases, as an improvement in sustainable transport options may lead to a reduction in the number of vehicles in the study area (due to them being replaced with more sustainable, higher capacity modes). The proposal includes secure cycle storage at the Park and Ride facility, which may encourage bike/bus interchange. Any improvements in the emissions from the buses being used would also make a positive contribute to greenhouse gases.	+
Landscape	The creation of a large Park and Ride car park in the vicinity of Cosmeston Lakes Country Park will have a negative landscape impact. Depending on the car park/access configuration, existing trees may be required to be removed to enable construction of the Park and Ride facility. The introduction of buses on Cardiff Barrage will also have a landscape impact.	- -
Townscape	It is not expected that the townscape would be impacted by this option. The only expected changes may be reconfiguring an existing junction.	0
Historic Landscape	It is not expected that the historic landscape would be impacted by this option.	0
Cultural Heritage	A slight negative has been scored for cultural heritage due to the proposed siting of the Park and Ride at Cosmeston Lakes Country Park, which is an important cultural attraction.	-
Biodiversity	The creation of a large Park and Ride car park at Cosmeston Lakes Country Park could potentially have a negative impact on biodiversity e.g. due to the designation of Cosmeston Lakes Country Park as a SSSI, Local Nature Reserve and important breeding area.	-
Water Environment	It is not expected that the water environment would be impacted by this option. Any water environment impacts of the creation of a car park in the vicinity of Cosmeston Lakes Country Park will need to be considered as the proposal is further developed.	0
Social and Cultural		
Commuting and Other Users	Option 2 aims to provide a sustainable transport option for commuting journeys to Cardiff Bay and Cardiff. The proposal improves opportunities for interchange and provides an alternative to car travel for commuting journeys and improves access to areas of employment. It is expected that the majority of users of the proposed bus service would be undertaking commuting journeys.	+ +
Reliability Impact on Commuting and Other Users	The reliability impact on commuting and other users is likely to improve as greater efficiency in movement of people is seen when trips are converted from private vehicles to other forms of public sustainable transportation. Dedicated bus access across Cardiff Barrage is likely to further contribute towards the reliability of journeys between the study area and Cardiff Bay.	+
Physical Activity	The intervention would likely have limited benefit on levels of physical activity and the overall impact is considered to be neutral. Positive factors include the location of the Park and Ride at Cosmeston may encourage users to visit the Country Park and bus users may be more likely to use an active mode for the start or end of their journey e.g. secure cycle storage is proposed at the Park and Ride facility. However, the proposed bus route across Cardiff Barrage may reduce the attractiveness of the existing Active Travel route and have a negative impact on levels of walking and cycling.	0
Journey Quality	A slight positive has been attributed to journey quality due to the likelihood that travel via sustainable modes will be prioritised through the corridor and users of the service will benefit from avoiding key congestion hotspots on existing routes into Cardiff.	+
Accidents	The introduction of buses onto Cardiff Barrage, which is currently traffic-free in sections, may increase the likelihood of conflict between buses, pedestrians and cyclists.	-
Security	Security may be improved at location of the proposed Park and Ride facility, where the level of surveillance would be increased due to the increased footfall. The proposal includes the provision of secure cycle storage and CCTV at the Park and Ride facility.	+
Access to Services	The proposal improves access to key services and facilities in Cardiff Bay and Cardiff City Centre. Access to services shows as a moderate positive due to improved sustainable transport options to access key destinations and the potential for a greater number of people (travelling via sustainable modes when compared with the private vehicle) to access a destination in the same amount of time.	+ +
Welsh Language	This option would not likely influence usage and/or uptake of the Welsh Language.	0
Tourism	The overall impact of Option 2 on tourism is considered to be neutral. Potential positive impacts are that the proposal would provide a bus link between important visitor attractions and provide a sustainable travel option between the two destinations i.e. Cardiff Bay and Cosmeston Lakes Country Park. The proposal may encourage users from the City Centre to visit Cosmeston Lakes on return journeys (Cardiff - Cosmeston). Improved journey times from Cardiff Bay to the study area may also encourage users who would not otherwise visit the study area to travel into Penarth. However, the proposed bus route across Cardiff Barrage could have a negative impact on the attractiveness of the existing traffic-free walking and cycling route, which is an important visitor attraction.	0
Affordability	The Transport Case economic assessment has shown that Option 2 represents poor value for money. This is due to the significant funding required to subsidise the Park and Ride bus service, the limited transport demand it would serve and the low level of benefits produced.	- -
Severance	Whilst communities along the corridor would have access to improved bus services, these already exist in certain locations (albeit via Cogan as opposed to via the Barrage). The bus route across the Barrage may reduce the attractivess of the existing walking and cycling route and discourage users of active modes to undertake the journey between Cardiff Bay and Penarth, thus increasing severance for more vulnerable users between the areas. Overall impact considered to be neutral.	0
Option Values	The option value of Option 2 is rated as slightly positive.	+

Option 3: Cogan Multi-Modal Sustainable Transport Interchange		
	Impacts	Scale
Economic		
Business Users & Reliability Impact	This option is likely to have minimal impact on business users and reliability due to the focus of the Park and Ride service being commuters travelling between the Vale of Glamorgan and Cardiff and the relatively limited impact of the proposal on reducing traffic levels to the benefit of business users.	0
Regeneration	A moderate positive is attributed to potential regeneration, as the creation of a multi-modal sustainable transport interchange may encourage (or has the potential to incorporate) development of currently vacant/ under-used sites surrounding the Cogan station site.	+ +
Wider Impacts	The option could have a positive impact on the wider highway network e.g. by removing traffic from congested routes into Cardiff. Investment in the Cogan Station site may also encourage further investment by businesses/investors. Active Travel improvements and the provision of an Access for All bridge over the rail line will improve accessibility for those with restricted mobility and could have wider physical benefits. Consideration will need to be given to the location of Park and Ride, as this may have potential to increase traffic locally (particularly on approaches and across the Baron's Court junction).	+
Environment		
Noise	Noise is not likely to be influenced to a great extent by this option. A transfer to sustainable modes may have a positive impact on noise, however consideration would need to be given to the impact of a potential increase in traffic accessing the proposed park and ride site.	0
Air Quality	Air Quality is not likely to be influenced to a great extent by this option. A transfer to sustainable modes may have a positive impact on air quality, however consideration would need to be given to the impact of a potential increase in traffic accessing the proposed park and ride site.	0
Greenhouse Gases	Greenhouse gases are not likely to be influenced to a great extent by this option. A transfer to sustainable modes may have a positive impact on greenhouse gases, however consideration would need to be given to the impact of a potential increase in traffic accessing the proposed park and ride site.	0
Landscape	The landscape of the area is likely to see a positive impact due to the proposed redevelopment of the derelict and currently underutilised area immediately surrounding the station (and potentially further expansion should the option attract further investment).	+
Townscape	The redevelopment of a current derelict and vacant site at Cogan Station would have a positive impact on townscape. The option may lead to further redevelopment of the areas immediately surrounding the station.	+
Historic Landscape	It is not expected that the historic landscape will be affected by this intervention.	0
Cultural Heritage	It is not expected that the cultural heritage will be affected by this intervention. Consideration would need to be given to the relocation of the Grade II listed footbridge at Cogan Station if necessary as part of the wider proposals.	0
Biodiversity	It is not expected that biodiversity will be affected by this intervention, although the railway corridor has been highlighted as an important habitat for some species.	0
Water Environment	It is not expected that the water environment will be affected by this intervention. Any water environment impacts of the creation of a multi-modal interchange and Park and Ride will need to be considered as the proposal is further developed.	0
Social and Cultural		
Commuting and Other Users	Option 3 aims to improve the attractivess of rail services for commuting journeys to Cardiff. The proposal improves opportunities for interchange, provides an alternative to car travel for commuting journeys and improves access to areas of employment. It is expected that the majority of users of the proposed Park and Ride would be undertaking commuting journeys.	+ +
Reliability Impact on Commuting and Other Users	A moderate positive is seen for reliability impact on commuting and other users due to the improved options for interchange between modes as a result of the creation of a sustainable transport interchange e.g. interchange between active travel/rail, car/rail and rail/bus.	+ +
Physical Activity	The option is likely to have a positive impact on physical activity due to the improvements in Active Travel facilities proposed. The Cogan Interchange proposals may encourage more people to use public transport and use active modes to travel from the nearest stop/station from/to their starting point or final destination. The extent of the positive impact on physical activity may be limited by the provision of an expanded Park and Ride facility, which may encourage users that previously walk to the station to instead choose to travel by car.	+
Journey Quality	Journey quality is viewed to be a moderate positive due to the improved connections and interchange opportunities that will be made possible by a multi-modal transport interchange. The proposed Active Travel improvements will improve journey quality on walking links to and within the station site.	+ +
Accidents	Overall a neutral impact on accidents is expected as a result of Option 3. For example, the proposal includes measures to improve Active Travel facilities e.g. improvements are proposed as part of this option to crossing facilities across the A4160 Cogan Hill, which could provide a safer environment for more vulnerable users. However, the expanded Park and Ride could potentially increase traffic and congestion in the vicinity of Cogan Station, which could increase potential conflict with pedestrians and cyclists.	0
Security	A slight positive impact is expected on security for this option due to improvements proposed e.g. secure cycle parking and CCTV at the Park and Ride facility. An improvement to the public realm around Cogan may encourage more users and increase surveillance at the station and within the vicinity.	+
Access to Services	Access to services would likely improve moderately with a multi-modal transport interchange at this location, particularly if additional services are included as part of the interchange plans. The proposals will improve opportunities for interchange and increase the attractiveness of rail services to access services in Cardiff City Centre. Additionally, access to the proposed Wellbeing Hub at Penarth Leisure Centre (Cogan) would be more easily accessible by public transport.	+ +
Welsh Language	This option would not likely influence usage and/or uptake of the Welsh Language.	0
Tourism	This option is not likely to encourage or discourage tourism within the study area.	0
Affordability	The Transport Case economic assessment has shown that Option 3 represents high value for money. This is mainly due to the significant vehicle operating cost and parking charge savings gained by users transferring form car to train.	+
Severance	Severance may be improved as the proposals include Active Travel measures e.g. provision of an Access for All bridge over the rail line, improved crossing facilities over the A4160 Cogan Hill (highlighted as a problem at both Stage One and Two consultation activities). The positives attributed to this option are limited due to the potential increase in traffic levels associated with the proposed Park and Ride.	+
Option Values	The option value of Option 3 is rated as slightly positive.	+

Option 4: Do Minimum		
	Impacts	Scale
Economic		
Business Users & Reliability Impact	A Do Minimum approach is likely to make the existing identified problems worse and more negatively affect business users and reliability of travel within the study area.	-
Regeneration	Regeneration is likely to be negatively influenced as a lack of investment into the transport of the area is unlikely to encourage investment by businesses/ stakeholders.	- -
Wider Impacts	Wider impacts may be felt in other areas as private vehicle users may, to avoid pockets of congestion, divert via unsuitable routes for the levels of traffic. Other negative impacts may be felt by those wishing to visit the study area, but discouraged due to the lack of transport infrastructure.	-
Environment		
Noise	A lack of action may result in additional traffic congestion, and increased noise associated with increased traffic volumes.	-
Air Quality	Air quality is also likely to be made worse as an increase in population will lead to an increase in those using routes and therefore an increase in vehicles waiting in congestion emitting pollution.	-
Greenhouse Gases	As above, it is likely that the increase in private vehicles will be those that emit greenhouse gases.	-
Landscape	The landscape is likely to be negatively influenced, as no improvements are likely to be made to currently uninviting/derelict areas of the study area.	-
Townscape	A negative impact is predicted upon the townscape as no improvements are likely to be made to currently uninviting/derelict areas of the study area. An increase in traffic levels will have a negative impact on the town centre environment.	-
Historic Landscape	It is not envisaged that the historic landscape will be significantly affected by this option.	0
Cultural Heritage	It is not envisaged that the cultural heritage of the area will be significantly affected by this option.	0
Biodiversity	Biodiversity may be negatively affected due to an expected increase in congestion and traffic levels across the study area.	-
Water Environment	It is not envisaged that the water environment of the area will be significantly affected by this option.	0
Social and Cultural		
Commuting and Other Users	Commuters and those wishing to access other services are expected to experience a moderately negative impact from this option, due to the predicted increase in population and an increase in people travelling via all modes through the area. It is expected that will lead to increased traffic levels and increased congestion.	- -
Reliability Impact on Commuting and Other Users	Reliability may be impacted as those travelling through the study area experience further congestion. The network resiliance also would not be improved and infrastructure may become more expensive to maintain with time.	- -
Physical Activity	A do minimum intervention is likely to do very little to encourage physical activity.	-
Journey Quality	Journey quality is also likely to suffer as a result of a do minimum approach due to the lack of solutions for current and future levels of congestion.	-
Accidents	Increased traffic levels are likely to have a negative impact on accident rates across the study area.	-
Security	A do minimum option is not likely to have a significant influence on security in the study area.	0
Access to Services	Access to services may be negatively affected due to increased traffic and congestion, as well as current severance at various locations within the study area not being addressed.	- -
Welsh Language	This option would not likely influence usage and/or uptake of the Welsh Language.	0
Tourism	This option may negatively affect tourism in the area, as increased/continued congestion on routes into and out of the study area are unlikely to encourage tourists to visit the area.	-
Affordability	No investment in new infrastructure required, although negative impacts of identified problems would increase over time.	0
Severance	Severance may be affected as no new infrastructure will be provided to improve connections within communities e.g. at busy junctions, between Cardiff Barrage and Penarth Esplanade. Increased traffic levels and congestion will have a negative impact on severance for pedestrians.	-
Option Values	Neutral score given to the do minimum option.	0

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WelTAG STAGE TWO REVIEW GROUP

SUBJECT

Penarth to Cardiff Barrage Sustainable Transport Corridor

WelTAG Stage Two | Outline Business Case

Review Group Meeting | DRAFT AGREED OUTCOMES

DATE & TIME

Tuesday 24 September 2019 (11:00 – 13:00)

LOCATION

Vale of Glamorgan Council | The Alps Depot | Wenvoe | South Glamorgan | CF5 6AA

ORGANISER

Matthew Fry

CHAIR

Emma Reed

ATTENDEES

Councillor Peter King
Cabinet Member for Neighbourhood Services and Transport | Vale of Glamorgan Council

Councillor Kathryn McCaffer
Cabinet Member for Leisure, Arts and Culture | Vale of Glamorgan Council

Emma Reed
Head of Neighbourhood Services & Transport | Vale of Glamorgan Council

Kyle Phillips
Group Manager Transport Services | Vale of Glamorgan Council representing Active Travel and public transport interest

Michael Clogg
Operational Manager for Highways and Engineering | Vale of Glamorgan Council representing highway matters

Clive Moon
Engineering Manager – Environment | Vale of Glamorgan Council representing flooding, drainage and other environmental matters

Kelly Hawkes
Vale of Glamorgan Council | Representing Youth Interests

Bethan Watkins
Vale of Glamorgan Council | Representing Youth Interests

Councillor Elliot Penn
Llandough Community Council

Clare Cameron
Project Development Officer Transport | Cardiff Capital Region representing regional transport interests

Councillor Mike Cuddy
Deputy Group Leader of the Council | Penarth Town Council

Emma Boylan
Town Clerk | Penarth Town Council

Peter Newton
Policy Development Innovation Officer | Penarth Town Council

Councillor Michael Philip Garland
Lavernock Ward | Sully and Lavernock Community Council

Cheryl Owen
Section Leader | Transport Vision, Policy and Strategy | Cardiff Council

Ryland Jones
Interim Deputy Director | Sustrans in Wales representing cycling interests

Sam Palmer
Business Development Manager | N.A.T Group

Michelle North-Jones
Principal Transport Planner | Real Estate & Infrastructure | Capita

Gemma Thomas
Transport Planner | Real Estate & Infrastructure | Capita

Matthew Fry
Project Manager | Arcadis Consulting UK Ltd representing Vale of Glamorgan Council

APOLOGIES

Adam Keen
Managing Director | N.A.T Group

Alison Thomas
Regional Transport Manager | Welsh Government

Amy Nichols
Rail Programme Sponsor | Transport for Wales

Andrew Eccleshare
Passenger Transport Manager | Vale of Glamorgan Council representing passenger transport interest

Andy Holder
Strategic Development Director | Transport for Wales

Anne Marie Little
Chair | Transport V50+SF

Dale Crutcher
Senior Commercial Scheme Sponsor | Network Rail

Gareth Stevens
Operations and Commercial Director | Cardiff Bus

Gwyn Smith
South East Wales Area Manager | Sustrans in Wales representing cycling interests

Marcus Goldsworthy
Head of Planning and Regeneration | Vale of Glamorgan Council representing historic and environmental matters as well as economic development

Matthew Gilbert
Active Travel Lead | Transport for Wales

Paul Carter
Head of Transportation | Cardiff Council

Rob Cleaver
Rail Programme Sponsor | Transport for Wales

Tom Porter
Consultant in Public Health Medicine | Cardiff and Vale Local Public Health Team

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Owner

1. Apologies

2. Introductions (including information about attendee representation)

3. Terms of Reference for Review Group

3.1 The draft terms of reference for the WelTAG Stage Two Review Group were discussed and changes agreed. The final terms of reference are as included in **Appendix A**.

4. WelTAG Stage Two Presentation

4.1 A summary presentation of the Penarth to Cardiff Barrage Sustainable Transport Corridor WelTAG Stage Two study was presented by Capita, including a summary of the WelTAG Stage One study.

5. Discussion, Questions and Comments from Review Group

5.1 This section of the meeting provided a platform from which all attendees could provide comments and feedback on each of the three WelTAG Stage Two options assessed. The agreed recommendations of the Review Group for implementation as part of a WelTAG Stage Three scope of works were as follows:

Option 1 | Active Travel Proposals for the Penarth to Cardiff Barrage Corridor

5.2 **It was recommended that Option 1 is taken forward to WelTAG Stage Three for further analysis.** The option shall appraise and consider the potential transport benefits of all active travel measures included within the WelTAG Stage Two Outline Business Case report as part of a single option, although the Penarth Headland Link (PHL) sub-option shall retain a separate implementation programme to the other active travel measures (those measures other than PHL) due to the complexity and large-scale context of the PHL proposal, as well as to allow the PHL appraisal to more widely reflect its potential leisure and tourism benefits.

5.3 The Review Group discussed and agreed that development of the option at WelTAG Stage Three will need to acquire more detailed evidence to support completion of the full business case (including analysis of latent

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walking and cycling demand), consider the impacts of climate change as a key element for appraisal, consider more ambitious active travel measures throughout the study area, consider more broad strategic connectivity towards Penarth Road (Cardiff) and extension of links to Barry, Sully and Lavernock, ensure safety and security is fully embedded as part of the option development process and establish effective proposals/ criteria for the strategic implementation of 20mph zones once Welsh Government guidance is available.

Option 2 | Cosmeston Bus Park & Ride and Bus Priority Link across Cardiff Barrage

5.4 With regard to the implementation of a new bus priority link, the Review Group recognised concerns regarding existing vehicle congestion points throughout and adjacent to the study area, the operational costs associated with the implementation of integral bus services, and operational constraints associated with the barrage as a result of barrage locking procedures.

5.5 In addition, there was broad support for not introducing bus operations onto Cardiff barrage (or other vehicle operations), with a strong emphasis towards protecting and retaining the extant transport benefits associated with the unrestricted walking and cycling link across the barrage.

5.6 It was noted by Cardiff Capital Region that the Barry/ Sully/ Penarth transport corridor is one of four strategic corridors that have been identified regionally as one that would benefit from modal shift to improve road-based congestion. Costs associated with the Park and Ride scheme were also challenged based on other scheme examples throughout the region. It is therefore noted that the provision of a Park and Ride facility or wider transport interchange at a location in the eastern Vale of Glamorgan area remains a wider aspiration in order to reduce car use for journeys to and from Cardiff. It is likely that a future strategic review will be needed of all potential locations for such a facility in order to analyse demand and take account of changing circumstances.

5.7 It was further acknowledged that Cardiff Council may continue to be interested in the development of a bus route over Cardiff barrage linking Penarth and Cardiff without the wider Park and Ride element.

5.8 **Following completion of the Review Group discussion, it was recommended that Option 2 is not taken forward to WelTAG Stage Three at this stage.**

Option 3 | Cogan Multi-modal Sustainable Transport Interchange

5.9 **It was recommended that Option 3 is taken forward to WelTAG Stage Three for further analysis. It is recommended that a partnership**

Owner

approach between Transport for Wales and Vale of Glamorgan Council is essential to take forward the work on Option 3.

5.10 The Review Group discussed this option and agreed that the key considerations for the next stage will be the provision of bus interchange anticipated to be on-road adjacent to the development site, effective connectivity with wider walking and cycling / active travel measures (including a link to Pont y Werin bridge, Cardiff Bay), integration/ connectivity to wider developments (e.g. the proposed well-being hub), the potential for transformational cycle parking facilities, shuttle bus connectivity with Llandough Hospital (and potentially other local services/ facilities) and effective enhancement of the existing car park.

6. Next Steps

6.1 The following next steps were set out:

- A draft **Agreed Outcomes** note will be produced to capture output stemming from the Review Group meeting, for consideration and approval with the Review Group. — MF
- The WelTAG Stage Two documentation will be updated to reflect the agreed outcomes of the Review Group and submitted for consideration by the Vale of Glamorgan Council Cabinet (21 October 2019) and Environment & Regeneration Scrutiny Committee (22 October 2019). — Capita
- The WelTAG Stage Two study will be presented to the Cardiff Capital Region Transport Authority on 23 October 2019.
- The WelTAG Stage Two study will be presented to the Vale of Glamorgan Council Penarth Project Board on 24 October 2019.
- The final decision on the study's progression to WelTAG Stage Three will be made by the Vale of Glamorgan Council Cabinet (04 November 2019).

End

Appendix A

Terms of Reference

TERMS OF REFERENCE

Penarth to Cardiff Sustainable Transport Corridor Study

Welsh Transport Appraisal Guidance (WelTAG)

Review Group | WelTAG Stage Two

Purpose

The purpose of the Review Group is to consider the contents of the draft WelTAG Stage Two Report, assess each of the options presented, and decide on the actions to be taken at the end of that WelTAG stage which will be presented to the Council's Cabinet for consideration and if required independently assessed.

The Stage Two report sets out for the Review Group how each of the proposed options will meet the stated objectives, the anticipated impacts of each option and the ways in which the context of the scheme will affect the achievement of objectives.

It will also consider the robustness of the proposed options to meet its objectives using sensitivity testing and scenario analysis including consideration of future scenarios. Key risks and dependencies will be presented.

The draft WelTAG Impacts Assessment Report contains the more detailed analysis that lies behind the material presented in the stage reports. This also been made available to the Review Group.

The Stage Two studies provide the evidence required for the Review Group to select and recommend to Cabinet a preferred option to take forward to Stage Three. This Report will therefore state clearly the issues which will be pertinent to the choice of the preferred option. This includes presenting evidence of the impacts on particular groups of people or areas, dependencies and key risks which could affect the achievement of the anticipated outcomes and an analysis of the positive and negative impact on social, economic, environmental and cultural well-being and the achievement of local, regional and/ or national well-being objectives.

Review Group Actions

The Review Group will:

1. Determine whether there are any transport options that can address the issues identified, contributes positively to the well-being goals and objectives, and can be delivered within technical and financial constraints.

2. Select a preferred option or options to be recommended to Cabinet to be taken forward to WelTAG Stage Three. It is expected that based on the evidence presented that the Review Group will agree an option to go forward to Stage Three. If there is disagreement amongst the Review Group members a vote can be held to determine the best option based on the evidence to progress to Stage Three.

TERMS OF REFERENCE

3. Agree the methods to be used to provide additional evidence where required for Stage Three.

4. Identify any legislative requirements that need to be met during Stage Three.

5. Document the decisions of the Stage Two Review Group, and the basis for these decisions.

Review Group Representation

Participants representing the following organisations have been invited to form the Review Group:

- Cardiff Bus
- Cardiff Capital Region
- Cardiff Council
- KeolisAmey
- Llandough Community Council
- N.A.T. Group
- Network Rail
- Penarth Town Council
- Public Health Wales
- Sully and Lavernock Community Council
- Sustrans
- Transport for Wales
- Vale of Glamorgan Council | Relevant Technical Officers as needed to advise
- Vale of Glamorgan Council | Youth Participation
- Welsh Government

The meetings will be chaired by the Vale of Glamorgan Council's Head of Neighbourhood Services and Transport or nominated deputy.

The relevant Cabinet Member(s) may attend to observe the proceedings.

Confidentiality

Until such a time as the Stage Two Reports and Review Group recommendations are considered by Cabinet, the matters considered and discussed at the Review Group meetings are **Strictly Confidential**. The reason for this is that to release any information and matters discussed at the Review Group earlier could prejudice the outcome of the Stage Two Report.