

Scrutiny E+R 16th October - re Agenda Item 5 - Appendix A

Davies, Gareth J

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Subject: Urgent Attention - Scrutiny Report 16 October, 2019 - WELTAG

Hi Gareth

This needs to be submitted with the Scrutiny Report WelTAG – Also attached is replacement Appendix A.

Message on behalf of Emma - This is the list for Gareth of the changes from P03 to P04.

Changes made from P03 (to version P04). Page references refer to version P04. These are as a result of the Review Group Changes

Page 89: Table 6.1 - insertion under second bullet of: 'Development of the network should be in line with the requirements of the Welsh Government's Active Travel Design guidance.'

Page 100: Changes made to paragraph 6 – deletion of sentence and insertion of 'separate implementation plans should be developed for the PHL proposal and for the other Active Travel Proposals within Option 1'. Also additional text of 'the reasons for recommending a separate implementation plan for the PHL proposal.'

Page 101: Change to second paragraph to read '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 proposal within Option 1. The package of Active Travel proposal within the Option 1 (other than the PHL) are hereafter referred to as the Penarth Active Travel Network for the ease of reference.'

Page 101: Third paragraph insertion of 'this also reflects Welsh Government aspirations to fund ambitious Active Travel scheme that have the potential to transform walking and cycling' & 'and in releasing latent demand for the journeys by walking and cycling.'

Page 103: Third paragraph Changes to the first para to read: '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 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 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 would need to be fully integrated with wider developments taking place across the area e.g. proposed housing developments at Cosmeston, 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.'

Page 103: Paragraph three changed to '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.'

Page 106: Paragraph one changed to 'A summary of the further work required to develop Option 1 to a pre-delivery stage is included in Table 7.1 and 7.2. The tables below have identified separately the further work required for the PHL and the Penarth Active Travel Network proposals, which reflect the recommendation that the PHL should have a separate implementation plan to the other Active Travel proposals within Option 1.'

Page 106: Table 7.1 Added to second bullet point 'Development of the network should be in line with the requirements of the Welsh Government's Active Travel Design Guidance.'

Page 107: Insertion of new bullet as follows 'The study should also consider opportunities to extend the network and incorporate additional connections to the wider area, e.g. to Cardiff via Penarth Road and to Sully via Lavernock Road, and into development sites e.g. extension of the Active Travel route along the railway path into proposed housing developments at Cosmeston.'

General changes to Chapter 7 – Naming of Option 1a and Option 1b (Active Travel Package) – Changed in a number of places of reference to Penarth Active Travel Network and PHL respectively.

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Penarth to Cardiff Barrage Sustainable Transport Corridor Study

WelTAG Stage Two - Draft Report

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

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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
WeITAG	Welsh Transport Appraisal Guidance

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Supporting Information

Impact Assessment Report

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 2017² 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 One³ assessment was agreed⁴, 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.

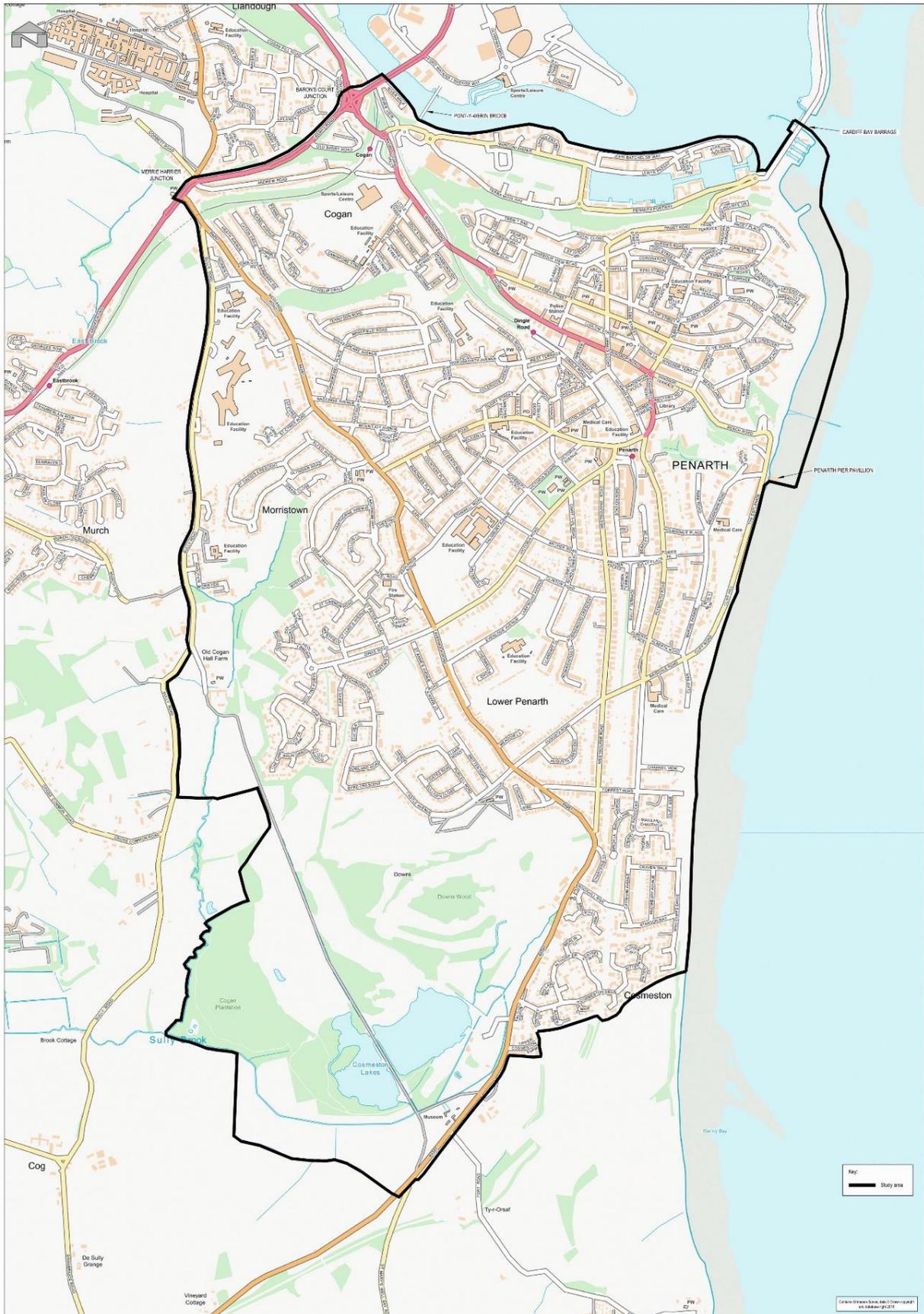
In addition to the detail provided in this Report, an accompanying Impact Assessment Report (IAR) provides a supporting record of detailed evidence and analysis.

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 Guidance⁵, 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 2017⁶, 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.
- 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.
- 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/airquality/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.
- 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.
- 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 Glamorgan⁹. 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 WeITAG Stage One process involved the identification of five study objectives, which were developed through the WeITAG consultation events, a review of previous studies and consideration of the identified problems. As part of the WeITAG 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 WeITAG 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 WeITAG 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.

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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.

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

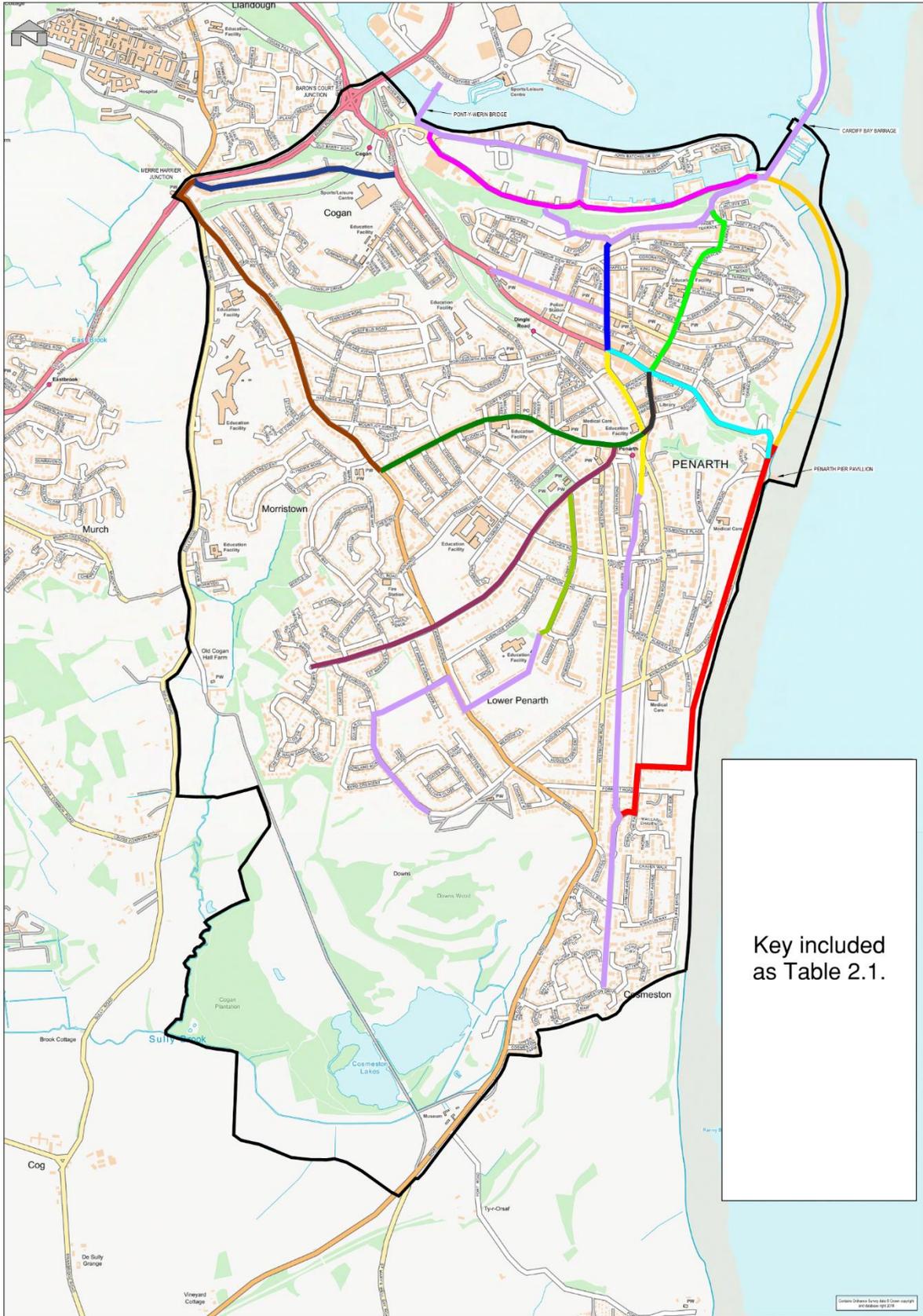


Table 2.1 – Key for Figure 2.1

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

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 1993¹⁰, 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 Council¹¹ 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 Council¹¹ 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 INM¹², 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 proposals¹³. 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 WeITAG Stage Three.

It was recognised at WeITAG 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

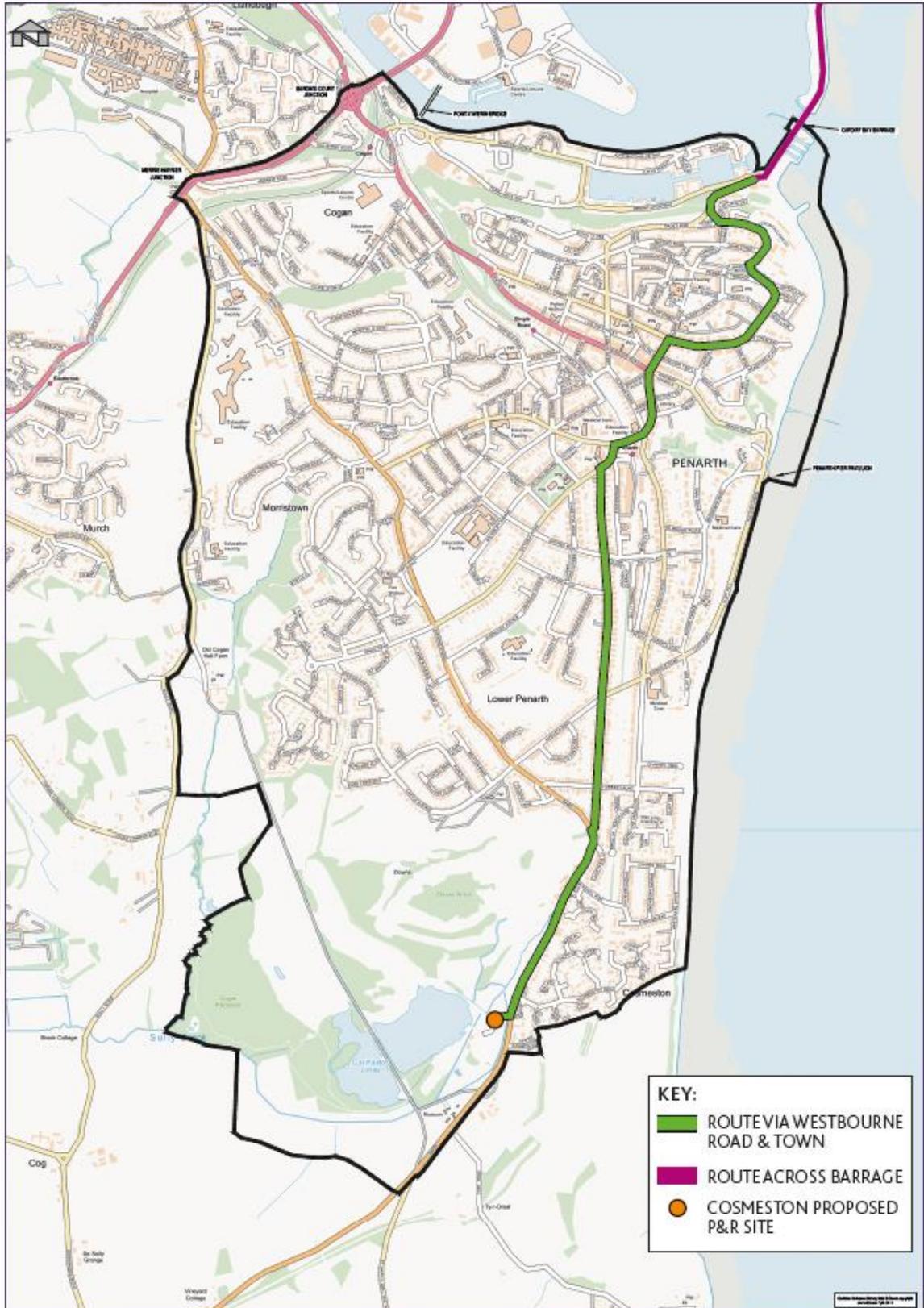
This option consists of a bus park and ride and bus priority scheme providing a link along the Penarth to Cardiff Barrage Corridor. The option includes the following elements:

- 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.

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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) report¹⁴ 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.

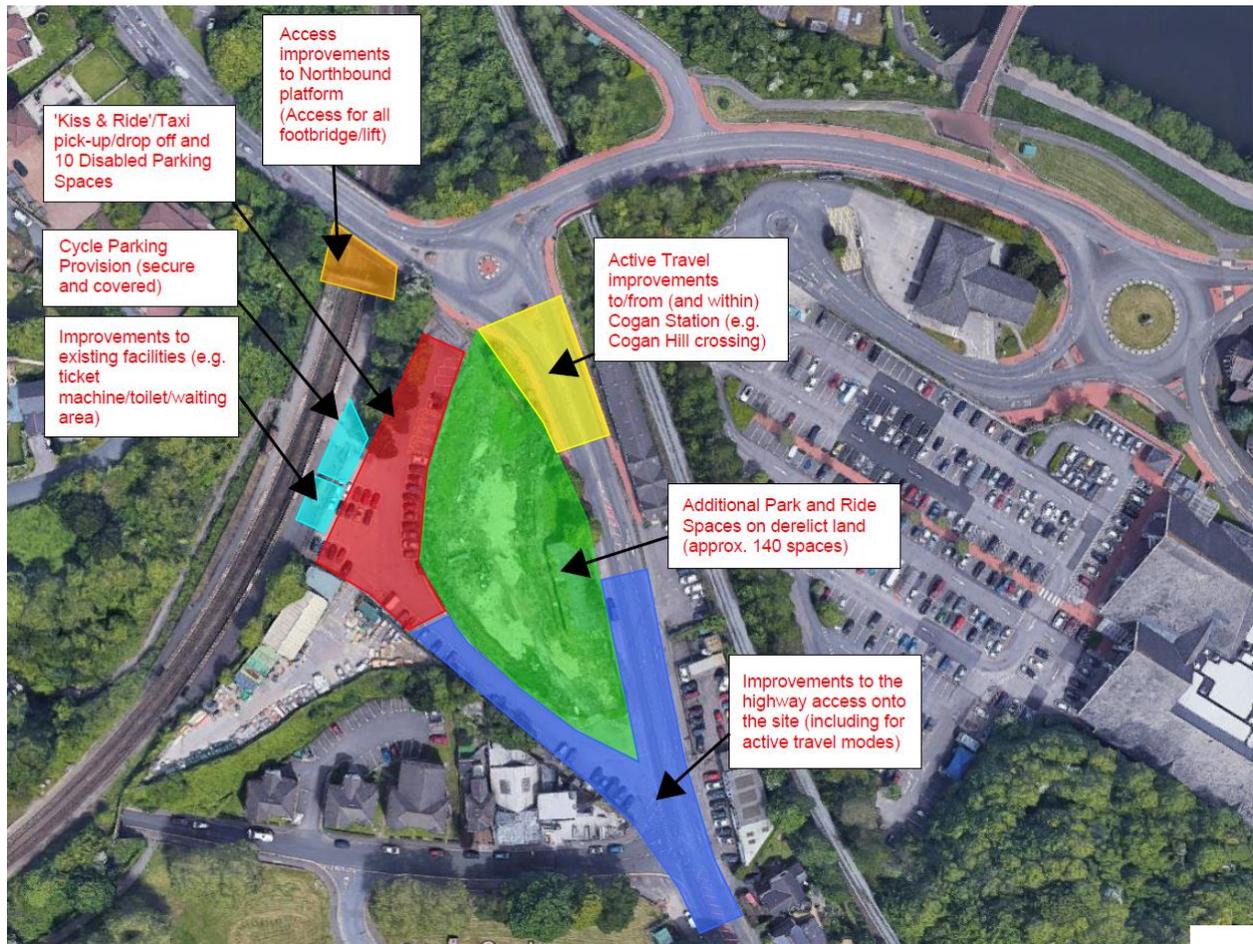
The development of the economic assessment has assumed that the existing Baycar 6 bus service, which currently runs from Cardiff City Centre to Cardiff Bay would be extended over the barrage, through Penarth and onto the park and ride facility. The extension of the Baycar service is considered the most 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 is 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.

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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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

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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://gwedhill.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 Travel		
Description	<p>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.</p>	
How does it tackle the problem?	<p>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.</p> <ul style="list-style-type: none"> • 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

<p>Adverse Impacts and Dependencies</p>	<ul style="list-style-type: none"> 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. 								
<p>Constraints</p>	<ul style="list-style-type: none"> 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. 								
	<table border="1"> <tr> <td data-bbox="395 1200 1331 1238">Feasibility (Technical)</td> <td data-bbox="1331 1200 1441 1238">0</td> </tr> <tr> <td data-bbox="395 1238 1331 1276">Acceptability</td> <td data-bbox="1331 1238 1441 1276">+</td> </tr> <tr> <td data-bbox="395 1276 1331 1314">Timescale</td> <td data-bbox="1331 1276 1441 1314">0</td> </tr> <tr> <td data-bbox="395 1314 1331 1357">Risks</td> <td data-bbox="1331 1314 1441 1357">-</td> </tr> </table>	Feasibility (Technical)	0	Acceptability	+	Timescale	0	Risks	-
Feasibility (Technical)	0								
Acceptability	+								
Timescale	0								
Risks	-								
<p>Key Risks</p>	<p>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:</p> <ul style="list-style-type: none"> 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. <p>Other risks (not related to PHL):</p> <ul style="list-style-type: none"> 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	<p>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:</p> <ul style="list-style-type: none"> • 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?	<p>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:</p> <ul style="list-style-type: none"> • 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.	+
	Introduce sustainable transport measures that protect and enhance the historic, built and natural environment.	0

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage	
Adverse Impacts and Dependencies	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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; • 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.

Option 2 - Bus Park and Ride and Sustainable Transport Links Across Cardiff Barrage		
	Feasibility (Technical)	0
	Acceptability	-
	Timescale	0
	Risks	-
Key Risks	<ul style="list-style-type: none"> • 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. 	

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Table 2.5 – Option 3 – Strategic Case Summary Table

Option 3 - Multi-Modal Sustainable Transport Interchange		
Description	<p>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.</p>	
How does it tackle the problem?	<p>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:</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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		
	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

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Table 2.7 – Summary of Option Appraisal

Appraisal Criteria		Option			
		Option 1	Option 2	Option 3	Option 4
		Active Travel proposals for the Penarth to Cardiff Barrage Corridor	Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	Cogan Multi-Modal Sustainable Transport Interchange	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 WeITAG 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 WeITAG Stage One report was developed in line with WeITAG 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, WeITAG 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 WeITAG 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 WeITAG 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 WeITAG 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
<p>Option 1 - Active Travel proposals for the Penarth to Cardiff Barrage Corridor</p>	<p>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.)</p>	<p>Cost estimate of the network of Active Travel routes has been developed for this WeITAG Stage Two Report. Cost estimate of the bike hire scheme provided by Vale of Glamorgan Council.</p>	<p>Network of Active Travel routes:</p> <ul style="list-style-type: none"> • 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. 	<p>£0.85M</p>

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	<ul style="list-style-type: none"> • 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 WeITAG 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

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
Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	<p>Bus park and ride facility at Cosmeston Lakes Country Park to provide:</p> <ul style="list-style-type: none"> • 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. 	<p>Cost estimate has been developed for this WeITAG Stage Two Report.</p>	<ul style="list-style-type: none"> • 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
	<p>Bus route across Cardiff Barrage including:</p> <ul style="list-style-type: none"> • 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. 	<p>Preliminary cost estimate included in Cardiff Bay Barrage Transport Link Feasibility Report (Arup, 2015)</p>	<ul style="list-style-type: none"> • 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 • 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. 	£3.2M

Option	Description of elements costed	Source of cost estimate	Information to support cost estimate	Capital cost estimate
Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	<p>Improvements to Cogan Station to create a multi-modal interchange facility as detailed in Section 2.6. Cost estimate includes:</p> <ul style="list-style-type: none"> • 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. 	<p>Cost estimate has been developed for this WeITAG Stage Two Report.</p>	<ul style="list-style-type: none"> • 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.

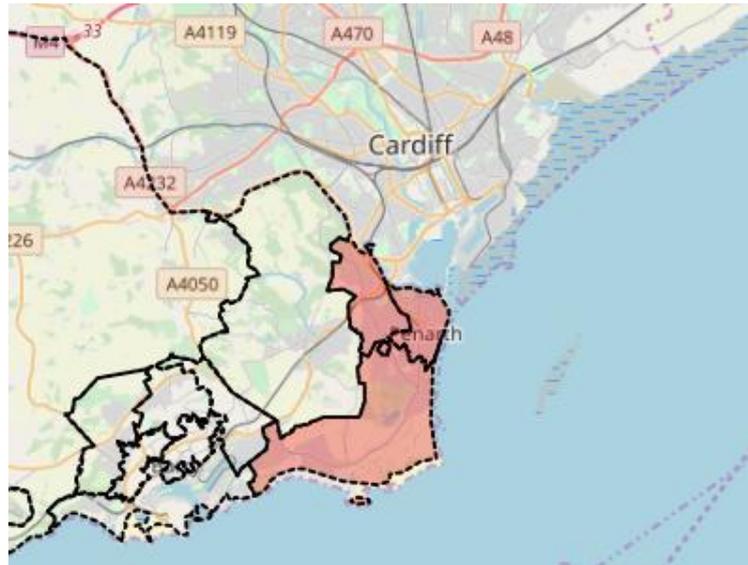
At this stage, the proposed introduction of an area-wide 20mph limit has not been considered by the economic assessment. This is due to the cost of a proposed 20mph limit not being included within Option 1 at this stage, as an area for the 20mph limit has yet to be defined.

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.

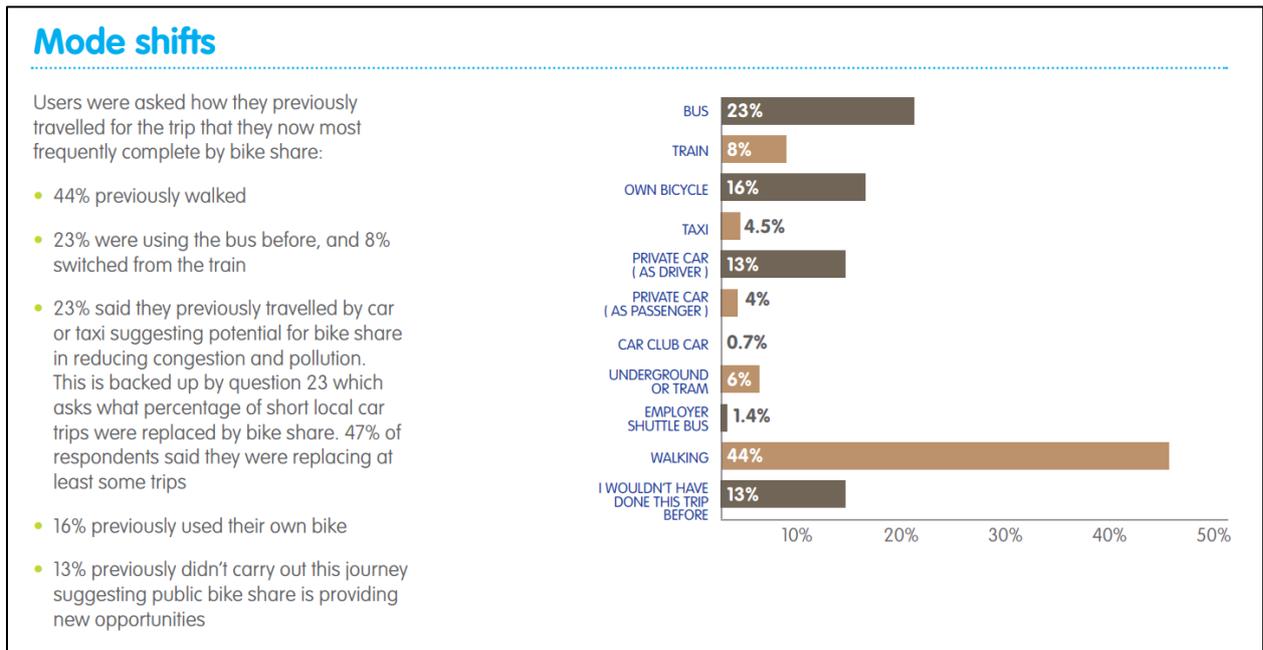
Table 3.3 – Forecast Walking and Cycling Trips in Penarth and Immediately Surrounding Areas – Option 1

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 study²² 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 2018²³, a scheme impact assessment of PHL undertaken by ARUP in 2018²⁴ 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 2016²⁵.

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)	<ul style="list-style-type: none"> • Journey Quality (walk): £205K • Physical Benefits: £1.37M • Marginal External Cost Savings: £520K • Total: £2.1M 	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Option 1 Total Benefits: £2.1M • Journey Quality (Cycle): £672K • Physical Benefits: £14.73M • Marginal External Benefits: £1.0M • Total: £18.06M 	<ul style="list-style-type: none"> • Option 1 Total Cost: £493K 		
Core Scenario + Low Cost Estimate		<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Wider Economic Benefit: £9.82M • Total: £27.88M 	Low Cost Estimate: <ul style="list-style-type: none"> • Total: £7.16M 	£20.65M (£15.38M)	3.86 (3.13)
Adjusted BCR Scenario + High Cost Estimate	<ul style="list-style-type: none"> • Wider Economic Benefit: £9.82M • Total: £27.88M 	High Cost Estimate: <ul style="list-style-type: none"> • Total: £11.72M 	£16.09M (£10.83M)	2.37 (1.92)
Option 2 Cosmeston Bus Park and Ride & Bus Priority Link across Cardiff Barrage	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
	<ul style="list-style-type: none"> • Bus Fare Costs: £-1.97M • Total: £9.20M 			
Option 3 Cogan Multi-Modal Sustainable Transport Interchange	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 WeITAG 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 WeITAG 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 WeITAG 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.

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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

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.

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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	<p>Transport benefits – journey quality, physical benefits, marginal external benefits.</p> <p>Wider economic benefits relating to leisure and tourism included in adjusted BCR.</p> <p>Costs – capital investment costs, operational and maintenance costs</p>	<p>Present Value Benefits (PVB) – sensitivity test values shown in brackets</p> <p>Core scenario £18,063,023 (£14,729,383)</p> <p>Adjusted scenario £27,879,780 (£22,610,442)</p> <p>Present Value Costs (PVC)</p> <p>Low Cost Scenario £7,229,573</p> <p>High Cost Scenario £11,785,322</p>	<p>1.53 – 2.50 (1.25 – 2.04)</p> <p>BCR range reflects low and high PHL cost estimates.</p> <p>Sensitivity test values shown in brackets.</p>	<p>2.37 – 3.86 (1.92 – 3.13)</p> <p>BCR range reflects low and high PHL cost estimates.</p> <p>Sensitivity test values shown in brackets.</p>	<p>Overall impact – Moderate positive</p> <p>Strong positive impacts recorded – physical activity, severance.</p> <p>Moderate positive impacts recorded – regeneration, wider impacts, air quality, greenhouse gases, commuting and other users, journey quality, access to services, tourism.</p> <p>Detail of assessment included in Appendix 22 of the IAR.</p>	<p>Risks and uncertainties relating to cost estimates detailed in Table 3.1.</p> <p>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.</p>	<p>Low to High</p> <p>VfM category based on the results of the economic assessment.</p> <p>VfM category of Option 1 is greatly affected by the cost of the PHL proposal and potential wider impacts such as tourism benefits.</p> <p>VfM category range reflects the PHL scenarios considered by the economic assessment.</p>

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)	<p>Transport benefits – journey quality, physical benefits, marginal external cost savings.</p> <p>Costs – capital investment costs, operational and maintenance costs.</p>	<p>Present Value Benefits (PVB) £2,093,179</p> <p>Present Value Costs (PVC) £317,144</p>	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.	<p>Very High</p> <p>VfM category based on the economic assessment and supported by the qualitative assessment.</p> <p>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.</p>
Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage	<p>Transport benefits – marginal external benefits, fuel cost savings, non-fuel operating cost savings, parking charge savings, park and ride revenue, journey time benefits</p> <p>Costs – capital investment costs, operational and maintenance costs, park and ride service costs, bus fare costs</p>	<p>Present Value Benefits (PVB) £9,199,387</p> <p>Present Value Costs (PVC) £36,550,256</p>	0.25	N/A	<p>Overall impact – Neutral</p> <p>Moderate positive impacts recorded – commuting and other users, access to services.</p> <p>Moderate negative impacts recorded – landscape, affordability.</p> <p>Detail of assessment included in Appendix 22 of the IAR.</p>	Risks and uncertainties relating to cost estimates detailed in Table 3.1.	<p>Poor</p> <p>VfM category based on the economic assessment and supported by the qualitative assessment.</p> <p>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.</p>

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	<p>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.</p> <p>Costs – capital investment costs, operational and maintenance costs, train fare costs.</p>	<p>Present Value Benefits (PVB) £13,418,430</p> <p>Present Value Costs (PVC) £4,387,882</p>	3.06	N/A	<p>Overall impact – Slight positive</p> <p>Moderate positive impacts recorded – regeneration, commuting and other users, reliability impact on commuting and other users, journey quality, access to services.</p> <p>Detail of assessment included in Appendix 22 of the IAR.</p>	Risks and uncertainties relating to cost estimates detailed in Table 3.1.	<p>High</p> <p>VfM category based on the economic assessment and supported by the qualitative assessment.</p> <p>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.</p>

4. Financial Case

4.1 Overview

As detailed in WeITAG 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 WeITAG 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 WeITAG 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 WeITAG 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 WeITAG 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 WeITAG 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	<p>Preliminary capital cost estimate of Option 1:</p> <ul style="list-style-type: none"> Penarth Active Travel Network (without PHL) - £0.55M; PHL - £10M - £16.6M; and Penarth Cycle Hire Scheme – £0.3M. <p>Factors affecting lifetime capital cost of the project:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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	<p>Preliminary estimate of ongoing revenue costs:</p> <ul style="list-style-type: none"> 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. <p>Factors affecting lifetime revenue cost of the project:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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	<p>Preliminary capital cost estimate of Option 2:</p> <ul style="list-style-type: none"> • Cosmeston Park and Ride and bus route to Cardiff Barrage - £6.4M; and • Bus route over Cardiff Barrage - £3.2M. <p>Factors affecting lifetime capital cost of the project:</p> <ul style="list-style-type: none"> • 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). 	<ul style="list-style-type: none"> • Local Transport Fund and Local Transport Network Fund from Welsh Government; • City Deal; and • Developer funding. 	<ul style="list-style-type: none"> • Local authority in relation to grant funding.

Financial Case			
Option (Capital/ Revenue)	Lifetime Costs of the Project	Potential Sources of Funding	Accounting Implications
Revenue	<p>Preliminary estimate of ongoing revenue costs:</p> <ul style="list-style-type: none"> • 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. <p>Factors affecting lifetime revenue cost of the project:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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	<p>Capital</p> <p>Preliminary capital cost estimate of Option 3</p> <ul style="list-style-type: none"> Cogan Multi-Modal Sustainable Transport Interchange - £6.49m <p>Factors affecting lifetime capital cost of the project:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Welsh Government/ City Deal/ Metro. 	<ul style="list-style-type: none"> 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.
	<p>Revenue</p> <p>Preliminary estimate of ongoing revenue costs:</p> <ul style="list-style-type: none"> 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. <p>Factors affecting lifetime revenue cost of the project:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Transport for Wales budgets for maintenance of rail infrastructure; and Local authority budgets for highway maintenance. 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> No capital cost implications as the do minimum option assumes no investment in new transport infrastructure. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
	Revenue	<ul style="list-style-type: none"> Ongoing revenue requirements to maintain existing highway infrastructure and to subsidise existing supported bus services. 	<ul style="list-style-type: none"> Local authority budgets for highway maintenance. Local authority budgets and Welsh Government's Bus Services Support Grant (BSSG) to subsidise bus services. 	<ul style="list-style-type: none"> Local authority

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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
<p>Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor</p>	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.
<p>Option 2 – Cosmeston Bus Park and Ride and bus priority link across Cardiff Barrage</p>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
	<ul style="list-style-type: none"> 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. 	
<p>Option 3 – Cogan Multi-Modal Sustainable Transport Interchange</p>	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

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Table 6.1 – Scheme development considerations for Option 1

Option 1 – Active Travel proposals for the Penarth to Cardiff Barrage Corridor	
Development Stages	<p>Penarth Active Travel Network (PHL considered separately below):</p> <ul style="list-style-type: none"> • 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. Development of the network should be in line with the requirements of the Welsh Governments Active Travel Design Guidance. • 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. <p>PHL:</p> <ul style="list-style-type: none"> • Additional evidence <ul style="list-style-type: none"> • 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 report²⁶ 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

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

	<p>nature of the scheme, the construction strategy will need to be considered throughout the development of the design.</p> <ul style="list-style-type: none"> • Geotechnical considerations – A 2018 Arup report²⁷ 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 officers²⁸ 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 report²⁹ 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.
<p>Statutory Procedures/ Legal Requirements</p>	<p>Penarth Active Travel Network (PHL considered separately below):</p> <ul style="list-style-type: none"> • Environmental and ecological processes – <ul style="list-style-type: none"> • 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

	<p>PHL:</p> <ul style="list-style-type: none"> • Environmental and ecological processes – <ul style="list-style-type: none"> • 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.
<p>Risks and Deliverability Issues</p>	<p>Penarth Active Travel Network (PHL considered separately below):</p> <ul style="list-style-type: none"> • 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. <p>PHL:</p> <ul style="list-style-type: none"> • 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

	<p>report identifies that at least 1 year would be required to complete the necessary studies, assessments and licensing;</p> <ul style="list-style-type: none">• 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.
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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	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> • Environmental and ecological processes – <ul style="list-style-type: none"> • 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.

	<ul style="list-style-type: none"> • 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.
<p>Risks and Deliverability Issues</p>	<ul style="list-style-type: none"> • 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.

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Table 6.3 – Scheme development considerations for Option 3

Option 3 – Cogan Multi-Modal Sustainable Transport Interchange	
Development Stages	<ul style="list-style-type: none"> • Additional evidence – Additional survey work required to develop: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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.

	<ul style="list-style-type: none"> • 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.
<p>Statutory Procedures/ Legal requirements</p>	<ul style="list-style-type: none"> • Environmental and ecological processes – <ul style="list-style-type: none"> • 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.
<p>Risks and Deliverability Issues</p>	<ul style="list-style-type: none"> • 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 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 be 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, it 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 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.

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.

It is recommended that the future development of the Penarth Active Travel Network should take into account 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'³¹. 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.

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.

³¹ <https://gov.wales/welsh-government-announce-30m-active-travel-road-safety-and-safe-routes>

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.

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 process. 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 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 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 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 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.

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 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 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 private vehicle operating cost savings 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 potential 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.

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

A summary of the potential further work required to develop Option 1 to a pre-delivery stage is included in Table 7.1 and 7.2. The tables below have identified separately the further work required for the PHL and the Penarth Active Travel Network proposals, which reflect the recommendation that the PHL should have a separate implementation plan to the other Active Travel proposals within Option 1.

Table 7.1 – Summary of Further Work for Option Penarth Active Travel Network

Penarth Active Travel Network	
Development Stages	<p>Penarth Active Travel Network (PHL considered separately below):</p> <ul style="list-style-type: none"> • 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. Development of the network should be in line with the requirements of the Welsh Governments Active Travel Design Guidance. • 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 may 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	<p>Penarth Active Travel Network (PHL considered separately below):</p> <ul style="list-style-type: none"> • Environmental and ecological processes – <ul style="list-style-type: none"> • 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 the Penarth Active Travel Network 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 1 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 also consider opportunities to extend the network and incorporate additional connections to the wider area, e.g. to Cardiff via Penarth Road and to Sully via Lavernock Road, and into development sites e.g. extension of the Active Travel route along the railway path into proposed housing developments at Cosmeston.
- 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

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

Table 7.2 – Summary of Further Work for Option PHL

Penarth Headland Link	
Development Stages	<ul style="list-style-type: none"> • Additional evidence <ul style="list-style-type: none"> • 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 report³² 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 report³² 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 officers³³ 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 report³⁴ 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

	<p>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.</p> <ul style="list-style-type: none"> • 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.
<p>Statutory Procedures/ Legal Requirements</p>	<ul style="list-style-type: none"> • Environmental and ecological processes – <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Additional evidence – Additional survey work required to develop: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Any wider and longer-term development proposals (e.g. those 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. <ul style="list-style-type: none"> • 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.

	<ul style="list-style-type: none"> • 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.
<p>Statutory Procedures/ Legal requirements</p>	<ul style="list-style-type: none"> • Environmental and ecological processes – <ul style="list-style-type: none"> • 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 a 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. The outcomes of the Review Group meeting are detailed in a cover sheet to this Report. All the outcomes have been incorporated into the final version of this Report.

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