Newgale Coastal Adaptation

Strategic Outline Case/Outline Business Case

Pembrokeshire County Council

July 2018

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Acronyms

AQMA	Air Quality Management Areas
AADT	Annual Average Daily Traffic
AONB	Area of Outstanding Natural Beauty
BMV	Best and Most Versatile
DM	Do Minimum
EAC	Equivalent Annual Cost
EIA	Environmental Impact Assessment
FTE	Full Time Equivalent
GVA	Gross Value Added
IO	Investment Objective
LDP	Local Development Plan
NMU	Non-Motorised User
NT	National Trust
MSOA	Middle Layer Super Output Areas
NPC/NPV	Net Present Cost/Net Present Value
PCC	Pembrokeshire County Council
PCNPA/PCNP	Pembrokeshire Coast National Park Authority
PIA	Personal Injury Accident
PRoW	Public Rights of Way
SAC	Special Area of Conservation
SPA	Special Protection Areas
SPG	Supplementary Planning Guidance
SSSI	Site of Special Scientific Interest
SWWRCECF	South West Wales Regional Civil Engineering Contractors Framework
SWMWREC	South West and Mid Wales Regional Engineering Consultants
TPO	Transport Planning Objective
WelTAG	Welsh Transport Planning and Appraisal Guidance
WG	Welsh Government
WTS	Wales Transport Strategy

1. Executive Summary

1.1. Introduction

The purpose of the SOC/OBC is to set out the case for the Coastal Adaptations required for the A487 at Newgale.

The total cost over the life span of the project is as shown below:

Project Costs and Welsh Government Contribution (£000)	
Capital Cost (including Coastal Adaptations and Capital LCC elements)	£14,438
Optimism Bias	£3,433
Risk	£2,810
Purchase of Land and Property	£631
VAT (only to be included where non-recoverable by applicant)	£0
Total Project Cost (inclusive of optimism bias and risk)	£21,312
Welsh Government Contribution (It is assumed that optimism bias and risk will be fully mitigated, or at a maximum of 2% of cost (for optimism bias) and 5% of cost (for risk) by FBC stage.	£15,984
Welsh Government Contribution	75%

The short-term funding requirements covering the main phase of construction are detailed in section 1.5.2.

1.2. Strategic Case

1.2.1. Strategic Context

A report into the stability of the shingle bank at Newgale following the December 2013/January 2014 storms indicated that the long-term stability of the shingle bank was not assured and that it was likely to become unsustainable over a period of 10-20 years which will result in the eventual loss of the coastal section of the A487 at Newgale, which would have impacts on the community of Newgale and the wider region. To deal with the issues of coastal flooding arising, Pembrokeshire County Council created the Newgale Coastal Adaptation Project.

A Newgale Adaptation Plan was developed in 2015 which was developed together with key stakeholders and the community. As part of the Plan, in February 2016, Pembrokeshire County Council / Cyngor Sir Benfro (PCC) published a Welsh Transport Planning and Appraisal Guidance (WelTAG) Planning Stage Report. The report considered potential transport interventions to overcome the road closure issue and Transport Planning Objectives (TPOs) were set.

Further parts of the Plan, which were enacted involved:

- An Adaptation Plan strategy which looks forward to the future of Newgale and its immediate areas and provides a managed route of actions for the community as a response to the changing coastal landscape, which resulted in recommendations for community adaptation measures as well as a framework for implementation, and;
- A WelTAG Stage 1 Assessment to examine how the road and the transport network may be secured in the face of coastal changes, which threaten the future transport provision. The WelTAG Stage 1 assessment was developed together with the Adaptation Plan.

1.2.2. The case for change

Newgale is on the A487 between Haverfordwest and St David's where the road crosses the valley of the Brandy Brook. It is defended from the sea by a shingle bank formed as a storm beach and which is considered to be a relict feature of sea level rise following the end of the last ice age.

The West of Wales Shoreline Management Plan (SMP) which received its final approval from the Welsh Minister in December 2014 following extensive public consultation, identified the area of Newgale as vulnerable. The SMP reported that attempting to sufficiently stabilise the shingle bank, behind which the road runs across the valley, would require major intervention. This would destroy the natural feature, creating a narrow shingle backshore similar to that along the northern part of Broad Haven and that the A487 road running out to the north would need substantial protection works.

A Royal HaskoningDHV (December 2014) report concluded that the shingle bank will become increasing unstable and vulnerable to failure. It is anticipated that it will be unsustainable in a timescale of 10-20 years, due to unacceptably high risk of failure, the high cost of more frequent closures and maintenance that arise culminating in the loss of the road infrastructure.

The need to move the road (irrespective of the route finally chosen) and the policy of allowing the coast to respond naturally leaves a requirement to plan how the implications of these changes are managed. This creates a need to look at the broader community issues and impacts and to consider how change may affect the area and how services can be sustained. Newgale Adaptation Plan (July 2017) identified several locations that require adaptation in order to retain the vitality of the community at Newgale.

Looking further afield, it is acknowledged that the A487 is vital for the regional economy. The economy suffers loss from the road closures which currently occur and these losses will increase in frequency and scale due the impacts of climate change. The complete loss of the road will strike a further blow to the regional economy unless alternative routes are provided.

1.2.3. Investment Objectives

The Investment Objectives for this project are:

Ref.	Investment Objectives
IO1	To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.
IO2	To provide the optimal solution in terms of impact to the Pembrokeshire Coast National Park.
IO3	To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.
IO4	To protect the fabric, community, iconic nature and visual aspect of Newgale, while allowing the natural evolution of the coastline.
IO5	To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.

1.2.4. Economic value of the existing road

The report assesses the value of the A487 via Newgale to residents and found residents to have a high level of road use across different purposes.

Over 40% are using the existing road daily for work or access to education journeys. In addition, 85% of residents are also using the road regularly for social and leisure purposes; 70% for regular shopping and 62% for professional appointments. These reflect important activities to quality of life and economic and social wellbeing. The A487 via Newgale has a significant value to individuals within the area studied. The existing road provides access to the larger centre of Haverfordwest for smaller communities, providing social connection, access to health and education and work and leisure opportunities.

This analysis determined that there were over 3,000 businesses in the area studied, with an average of 7 employees, and a sector mix where accommodation, food, agriculture and retail sectors were particularly prominent and revealed the high extent of road use and lack of good alternatives for different business operations.

- 90% of businesses and organisations surveyed use the existing road at least weekly for a business purpose and 71% daily. However, 83% reported a lack of suitable alternative routes, with 11% identifying no suitable alternative for a business purpose;
- The importance of connectivity for business operations was emphasised in a survey taken for this report, where access to St David's, Solva, Newgale and Haverfordwest was scored 4 out of 5 and over. Being easily accessible by road was rated at 4.7 out of 5 on average and was the most important local feature;
- Around a quarter of the employees in the St David's Peninsula area use the A487 via Newgale road to travel to work;
- The number of employees for whom the existing road is critical and without suitable alternative, for their work journeys, was estimated at 160 employees in the St David's Peninsula area.

Economic value of the road

Total local annual turnover for the St David's Peninsula is in the range of £556m to £1,465m. Out of this it is conservatively estimated there is **£26m to £59m of turnover per year** which critically depend on the A465 through Newgale, where without the road their turnover could be negatively impacted.

Visitors overwhelmingly use the road network to both arrive at and travel around Pembrokeshire. The existing road provides connectivity between destinations and attractions, and therefore enhances the appeal of its other localities as places to stay or visit. The net economic value from visitors using the A487 via Newgale in the study area has an estimated value of **£3m to 8m per year** (with £1.6m of that within Newgale) for accommodation and food services a key aspect of the area's tourism sector.

Quantitative benefit also arises from the beneficial ecosystem impacts, notably the protection and enhancement of biodiversity and accessibility of the area. The Adaptation Plan brings particular value with the ecosystem services related to wetland water management and wetland and woodland regulation of air and water quality - without these aspects there would likely be a significant decline in the element quality, and flood risk could worsen. An indicative value estimates a range of **£30,000 to £490,000 per year** for the ecosystem services of the Newgale adaptation.

1.3. Economic case

The following choices for potential coverage of the project is considered for the scope as follows:

- Do Minimum – Maintain the Newgale beach and existing A487 road as it currently is without interference to the village.
- Intermediate – Provide a form of coastal defences, with limited construction at Newgale, to protect the existing A487 road.
- Maximum – Complete significant construction to either provide comprehensive flood defences to protect the existing road, or provide a new road while allowing the coast to evolve naturally.

The maximum scope is identified as preferred.

1.3.1. The long list

Within this potential scope, options were considered using the options selection framework within the HM Treasury Five Case Model. As a result of the scoping appraisal, the potential service solutions that referred to Minimum and Intermediate scope (highlighted red) were removed – with the exception of 'Do Nothing', which was been carried forward for comparative purposes.

Option	**Long list option details**	**Scope**
1	Do Nothing – continue existing maintenance.	Minimum scope
	Reinforce sea defences - Provide a short-term rock revetment in front of the existing highway. Similar to WelTAG Option 2a but for a limited time period.	Intermediate scope
	Maintain existing route (for maximum 20 years) - Upgrade Diversion Route (C3062-C3063-C3010) over time, to prepare for increased use. Will include community adaptations. WelTAG Option 10/11.	Intermediate scope
2	Reinforce sea defences with a permanent solution (i.e. a 6-metre high wall protecting the existing road). WelTAG Option 2b.	Maximum scope
3	Provide a raised road in the current location on a raised embankment. Option 2c.	Maximum scope
4	Provide a bridge or culverted causeway in the current location to replace the existing highway. WelTAG Option 2d.	Maximum scope
5	Provide a new highway, a composite of using a smaller embankment to raise the road plus a sea wall to provide the required level of defence; WelTAG Option 2e.	Maximum scope
6	Provide a new highway route behind the Duke of Edinburgh Inn. Will include community adaptations, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). WelTAG Option 3a.	Maximum scope
7	Provide a viaduct behind the Duke of Edinburgh Inn, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 3b.	Maximum scope
8	Provide a new highway route on a raised embankment, behind the Duke of Edinburgh Inn. Will include community adaptations, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). WelTAG Option 3c.	Maximum scope
9	Provide a new highway route (between Newgale farm and Wood farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 4.	Maximum scope
10	Provide a new highway route (between Newgale farm and Southwood farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 5.	Maximum scope
11	Provide a new highway route (between Pen-y-Cwm and Southwood Farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 6.	Maximum scope
12	Provide a new highway route a hybrid option of the Planning Stage Middle Corridor options (options 4, 5 and 6) and tying into the A487 to the south of Bay View Farm and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years), Will include community adaptations. WelTAG Option J.	Maximum scope
13	Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 7.	Maximum scope
14	Provide an embankment or viaduct further inland to the A487; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 8.	Maximum scope
15	Provide a highway link from Roch, skirting the marshy land, crossing Brandy Brook at its eastern end, and re-joining the A487 around Penycwm; retain the existing highway with maintenance for a reasonable period of time (maximum 20 years) and will include community adaptations. WelTAG Option 9.	Maximum scope
16	Upgrade the existing diversion route (C3062-C3063-C3010), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years), Will include community adaptations. WelTAG Option 10/11.	Maximum scope

1.3.2. Short list

Following the assessment, the short-listed options taken forward for Economic appraisal were:

- **Option 1** – Do Nothing, carried forward as a comparator only.
- **Option 7** – Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retaining the existing road for 20 years. Will include community adaptations.
- **Option 12** - Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing road for 20 years. Will include community adaptations.
- **Option 13** - Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the road for 20 years. Will include community adaptations.

Detailed economic appraisals undertaken for each of the short-listed options are summarised in the table below, which shows the key results of the economic appraisals for each option.

Option	Description	Undiscounted (£'000s)	Net Present Cost (£'000s)
1	Do Nothing	15,378	13,796
7 (previously WelTAG option 3b)	Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)	38,032	31,691
12 (previously WelTAG option J)	Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)	29,745	24,578
13 (previously WelTAG option 7)	Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)	31,666	25,752

1.3.3. Equivalent Annual Cost (EAC) & Economic Ranking

As the options are not considered over a consistent period of time (i.e. Do Nothing is appraised over 20 years, while the remaining options are appraised over 60 years), the Net Present Cost outcome does not give a true economic comparison.

Therefore, the EAC approach has been used to identify the most economically advantageous option (using the Welsh Government's Economic Appraisal spreadsheet). The EAC comparison has been completed on the appraisal excluding optimism bias.

On this basis, the Economic Ranking is shown in the table below:

Option	EAC (£m)	Ranking
Option 1: Do Nothing	0.94	3
Option 7 (previously option 3b): Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations	1.1	4
Option 12 (previously option J): Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations	0.81	1
Option 13 (Previously option 7): Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations	0.83	2

1.3.4. Benefit Appraisal Results

The following table summarised the qualitative benefits overall results:

	Option 1 (Do Nothing)	Option 7 (3b)	Option 12 (J)	Option 13 (7)
Ranking against criteria	4	1	2	3
Ranking against Investment Objectives	4	3	1	2
Overall ranking	**4**	**2**	**1**	**3**

1.3.5. Risk appraisal

Full risks were developed for each short-listed option. A summary of the risk values for each option, and the option rankings in terms of those values is shown below:

	Option 1 (Do Nothing)	Option 7 (3b)	Option 12 (J)	Option 13 (7)
Risk values (actual £m)	0	3.175	2.810	3,410
Overall Ranking	**1**	**3**	**2**	**4**

Within this assessment, Option 1 (Do Nothing) is ranked 1st, as there is no associated risk. Option 12 (Previously Option J) is ranked 2/4, having over £350k less risk than the nearest rival (Option 7, previously 3b) and £600k less risk than Option 13 (previously 7).

1.3.6. The Preferred Option

On the basis of the analysis undertaken the preferred option is Option 12 as shown below

	Option 1 (Do Nothing)	Option 7 (3b)	Option 12 (J)	Option 13 (7)
Economic appraisals (EAC)	3	4	1	2
Benefits appraisal (Combined)	4	2	1	3
Risk appraisal (risk value £m)	1	3	2	4
Total	8	9	4	9
Overall Ranking	**2**	**=3**	**1**	**=3**

The preferred option, and therefore scheme to be taken forward, is Option 12 (previously Option J) - Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations.

Option 1 – the Do Nothing option, although marked 2nd does not deliver any positive benefits or fulfil any investment objectives and it has a large economic disbenefit associated with the economic cost of road closures as a result of coastal change.

Option 7 (previously 3b) which ranks equal with option 13 (previously 7) has a higher EAC and Option 7 (3b) has a Net Present Cost of £31.691m which is significantly more than the cost of Option 12 (J) at £24.572m.

1.4. Commercial case

1.4.1. Procurement strategy

Subject to further analysis at FBC stage, Pembrokeshire County Council has concluded that the optimum procurement route will be to procure using the successor to the SWWRCECF/SWMWREC frameworks:

- South West Wales Regional Civil Engineering Contractors Framework (SWWRCECF) framework arrangement which ends in 2018 in partnership with Pembrokeshire, Neath Port Talbot and City and County of Swansea, and
- South West and Mid Wales Regional Engineering Consultants Framework (SWMWREC) framework arrangement which ends in 2020 in partnership with Pembrokeshire, Neath Port Talbot and City, Ceredigion, Powys and City and County of Swansea.

1.4.2. Required services

The project will require a full range of civil engineering consultancy professional expertise together with that of experienced planning and project management. The construction will require the services of an experience civil engineering contractor.

The specific details include:

- Quantity surveying support – to provide iterative cost plans;
- Civil and structural engineering design support – to assist the project team in their final choice of road design, coastal adaptations and provide services as defined by the ACE schedule of services;
- Environmental, ecology, archaeological and landscape architecture specialist design support– to assist the project team assess the impacts to the environment and to carry out the Environmental Impact Assessments;
- Environmental consultancy to carry out the Sustainability Appraisal;
- Engineering consultancy to carry out the preliminary Flood Consequence Assessment;
- Planners to carry out public consultation and planning applications – to assist the project team in their final choice of road design and coastal adaptations;
- Construction support – to build the new road and coastal adaptations, in line with the Council's preferred design;
- Business Assurance support – to develop and validate a business case for the new project;

- Topographical, Ecological and Ground Investigation Survey support – to ensure that the preferred route and coastal adaption project locations are suitable for the scheme. These will include geotechnical; ecological, topographical and archaeological surveyors.

All of these services will be procured through the existing Council frameworks – in this case through the SWMWREC framework for engineering consultancy or the SWWRCECF framework for contractors.

1.5. Financial case

The impact on the income and expenditure account and cost build up for the preferred Option 12 (formerly J) is shown in the tables below, which shows the capital and revenue costs for the project for the first 8 years in order to capture the main capital expenses.

Impact on the Organisation's income and expenditure account

£'000s	Total Cost	Years (Only years 0 - 8 shown, to capture main capital expenses)								
		0	1	2	3	4	5	6	7	8
		18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
Preferred way forward:										
Total Capital (inc. Land purchase, construction, coastal adaptation and LCC elements)	14,438	£142	£542	£430	£690	£1,116	£3,120	£6,780	£0	£0
Total Revenue	2,190	£43	£43	£43	£43	£43	£43	£43	£45	£38
Total	16,628	£185	£585	£473	£733	£1,159	£3,163	£6,823	£45	£38
Funded by:										
Existing Revenue	-1,440	-£24	-£24	-£24	-£24	-£24	-£24	-£24	-£24	-£24
Cash Releasing Benefits	-20	£0	£0	£0	£0	£0	£0	£0	-£20	£0
Total Existing	-1,460	-£24	-£24	-£24	-£24	-£24	-£24	-£24	-£44	-£24
Additional Funding Required	15,168	£161	£561	£449	£709	£1,135	£3,139	£6,799	£1	£14
Cumulative Funding		£161	£722	£1,171	£1,880	£3,015	£6,154	£12,953	£12,954	£12,968

1.5.1. Cost build-up for income and expenditure account

£'000s	NPC	Total Cost	Years (Only years 0 - 8 shown, to capture main capital expenses)								
			0	1	2	3	4	5	6	7	8
			18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
OPPORTUNITY COST											
Opening Value	£6,243	£6,243	£6,243	£0	£0	£0	£0	£0	£0	£0	£0
Opportunity Cost Total	£6,243	£6,243	£6,243	£0	£0	£0	£0	£0	£0	£0	£0
CAPITAL COSTS											
Construction Capital	£8,846	£10,459	£142	£542	£430	£690	£465	£3,120	£5,070	£0	£0
Coastal adaptations	£1,820	£2,525	£0	£0	£0	£0	£0	£0	£1,710	£0	£0
Lifecycle Capital	£403	£1,454	£0	£0	£0	£0	£0	£0	£0	£0	£0
Capital Cost Total	£11,069	£14,438	£142	£542	£430	£690	£465	£3,120	£6,780	£0	£0
REVENUE COST											
Revenue Costs	£726	£1,486	£24	£24	£24	£24	£24	£24	£24	£26	£26
Lifecycle Revenue	£341	£704	£19	£19	£19	£19	£19	£19	£19	£19	£12
Revenue Cost Total	£1,067	£2,190	£43	£43	£43	£43	£43	£43	£43	£45	£38
RISK RETAINED											
Project Risks	£2,459	£2,810	£74	£380	£426	£0	£190	£1,361	£379	£0	£0
Optimism Bias	£3,188	£3,433	£1,607	£320	£12	£34	£55	£1,377	£28	£0	£0
Risk Retained Total	£5,647	£6,243	£1,681	£700	£438	£34	£245	£2,738	£407	£0	£0
TOTAL COST	£24,026	£29,114	£8,109	£1,285	£911	£767	£753	£5,901	£7,230	£45	£38
BENEFITS											
Land Purchase/Capital Receipts	£552	£631	£0	£0	£0	£0	£651	£0	£0	-£20	£0
Benefits Totals	£552	£631	£0	£0	£0	£0	£651	£0	£0	-£20	£0
TOTAL	£24,578	£29,745	£8,109	£1,285	£911	£767	£1,404	£5,901	£7,230	£25	£38
CUMULATIVE TOTAL			£8,109	£9,394	£10,305	£11,072	£12,476	£18,377	£25,607	£25,632	£25,670

1.5.2. Overall affordability

Funding is required at £21.312m over 60 years (capital costs, project risks, optimism bias and land purchases), with £19.043m including capital costs (£12,169), project risks (£2,810), optimism bias (£3,188) and land purchases (£631) (but excluding VAT) which is due by year 8 of the scheme (2026/27 financial year).

The Council will meet the 25% contribution required to support this scheme, with the remainder to be met by Welsh Government should the funding mechanism be based upon current coastal flood risk management grant support.

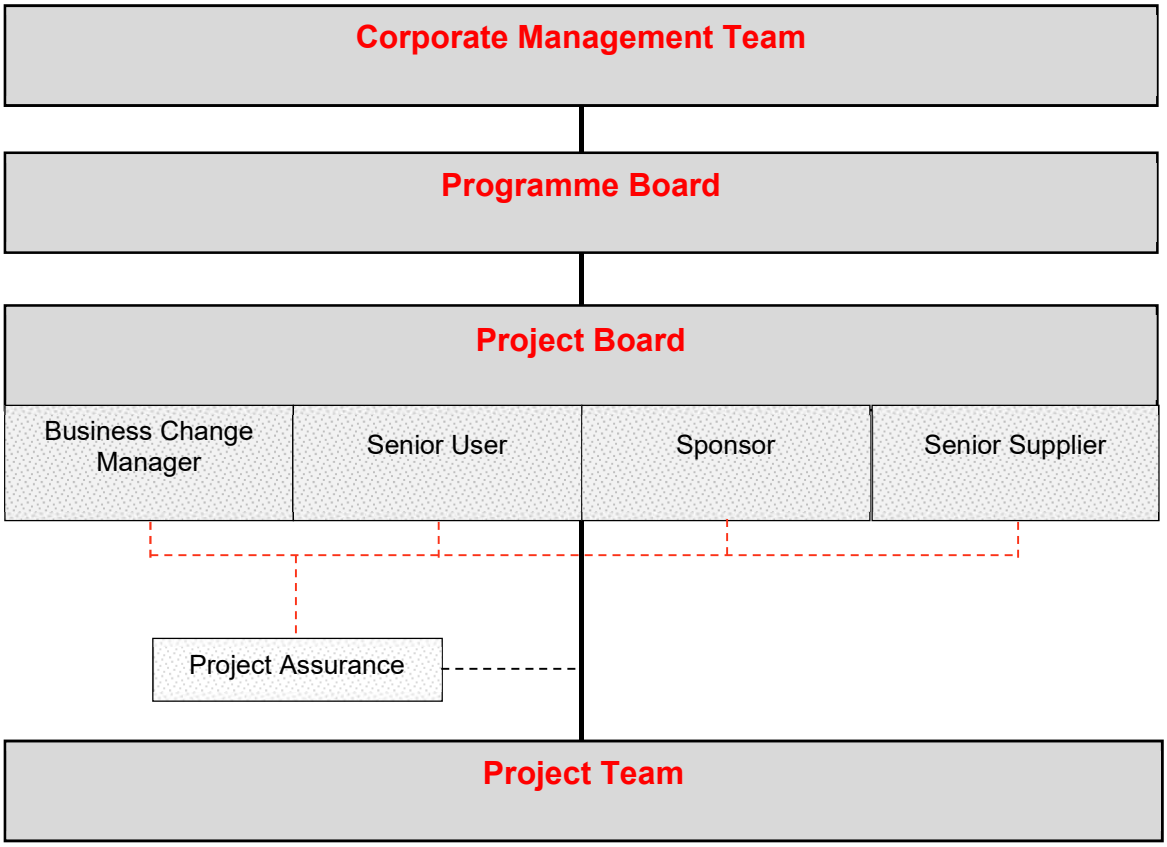
Further funding anticipated to occur after 2036 will be required to carry out the coastal adaptions required when the existing A487 road is eventually lost to erosion.

1.6. Management Case

This management case details the programme and project management arrangements for the preferred Option 12 (J).

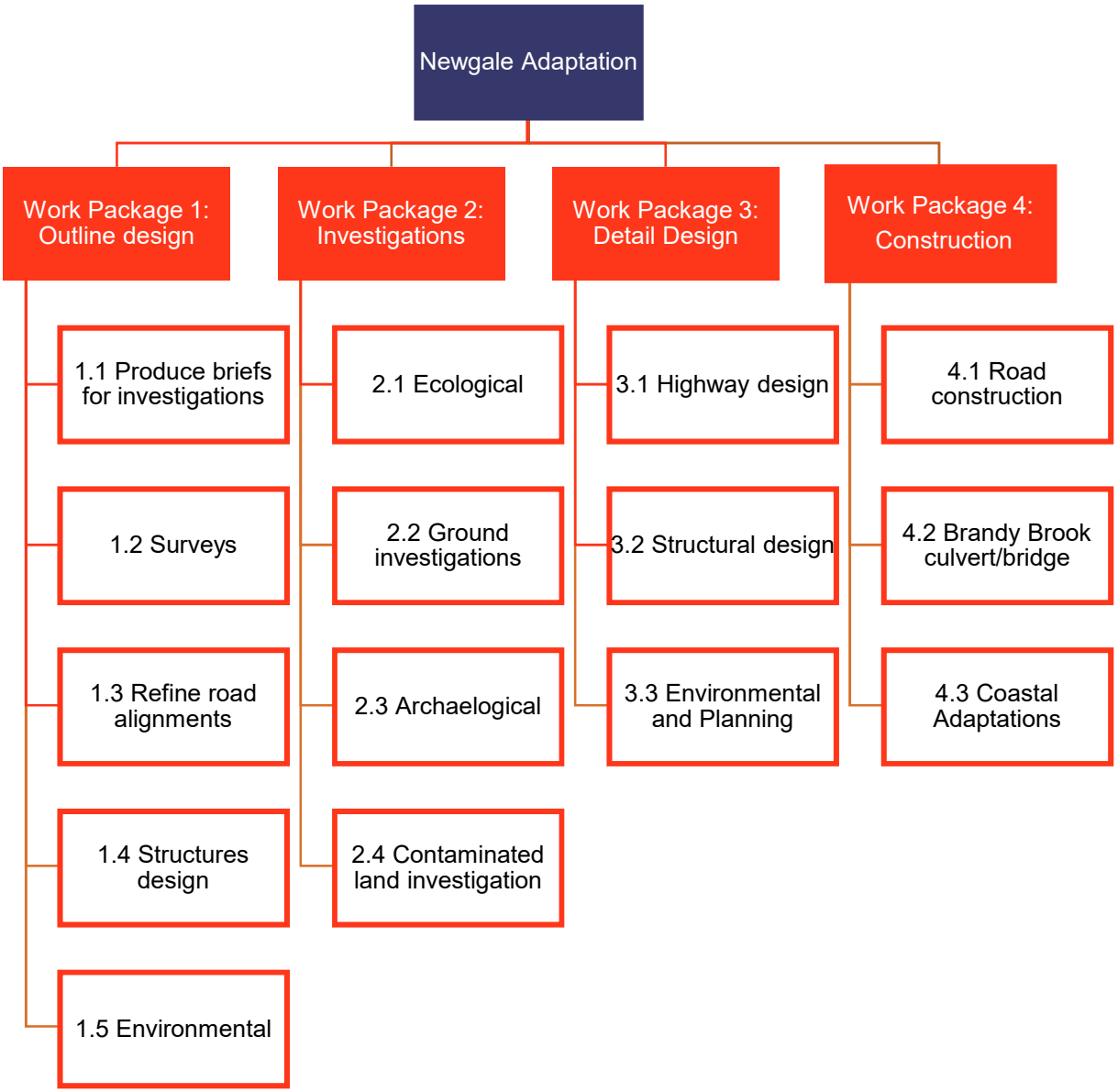
1.6.1. Project management arrangements

The project structure described below has been designed to ensure that the preferred option will have a robust project management function in place throughout the proposed timelines. This diagram demonstrates the lines of responsibilities and how the project will engage with the customer and supplier.



1.6.2. Project deliverables

The following project breakdown structure depicts the structure of the project:



1.6.3. Project Plan

The following is the timetable relating to the actions required to ensure the project will be delivered and be operational within the desired timeframe.

Date	Actions (commencement)
September 2018	Submit SOC/OBC
October 2018	Develop and issue consultants scope for outline design – mini competition
November 2018	Consultants contract awarded for outline design
December 2018	Work-packages for ground, ecological and archaeological investigations tendered.
January 2019	Investigation work-packages awarded
March 2020	Public Consultation on the Preferred Option
July 2020	Develop and issue consultants scope for detail design – mini competition
September 2020	Consultants contract awarded for detail design
July 2021	Planning Application (PCNPA)
June 2022	FBC (Final Business Case) submission
January 2022	Consents (NRW)
September 2022	Develop and issue contractors' tender documents
February 2023	Construction contract awarded
April 2023	Contractor commences onsite
April 2025	Road opens
April 2025	Coastal adaptations complete
January 2036	Existing A487 coast road anticipated to be lost
April 2036	Commence Phase 2 Coastal Adaptations
April 2038	Complete scheme

2. Strategic Case

Part A: The strategic context

A report into the stability of the shingle bank at Newgale following the December 2013/January 2014 storms indicated that the long-term stability of the shingle bank was not assured and that it was likely to become unsustainable over a period of 10-20 years which will result in the eventual loss of the coastal section of the A487 at Newgale, which would have impacts on the community of Newgale and the wider region. To deal with the issues of coastal flooding arising, Pembrokeshire County Council created the Newgale Coastal Adaptation Project alongside key stakeholders and public participants. A public consultation took place in February 2015 and subsequently, a Newgale Adaptation Plan was developed which was the subject of further stakeholder and community engagement culminating in a period for public responses between October and November 2015.

2014 Flooding on the A487– *image source: Matthew Baker Caravans Ltd.*

As part of the Plan, in February 2016, Pembrokeshire County Council/ Cyngor Sir Benfro (PCC) published a Welsh Transport Planning and Appraisal Guidance (WelTAG) Planning Stage Report. The report considered potential transport interventions to overcome the road closure issue and Transport Planning Objectives (TPOs) were set.

Further parts of the Plan, which were enacted involved:

- An Adaptation Plan strategy which looks forward to the future of Newgale and its immediate areas and provides a managed route of actions for the community as a response to the changing coastal landscape, which resulted in recommendations for community adaptation measures as well as a framework for implementation, and;
- A WelTAG Stage 1 Assessment, based on the Welsh Government guidelines available at the time, to examine how the road and the transport network may be secured in the face of coastal changes, which threaten the future transport provision. The WelTAG Stage 1 assessment was developed together with the Adaptation Plan.

Figure 2-1 Location of Newgale and the A487

This report is provided to validate options developed in both the Adaptation Plan and the WelTAG Stage 1 Assessment, using the Welsh Government's Better Business Cases approach using the Five Case Model.

This scheme is promoted by Pembrokeshire County Council as the Local Flood Risk Management Authority/Coast Protection Authority and Highway Authority. This scheme is also supported by the Welsh Government and Pembrokeshire Coast National Park Authority who are the Planning Authority. Land use planning within the National Park area is wholly the responsibility of the National Park Authority. The scheme also has involvement from key stakeholders which includes:

- Local Action Groups;
- Local businesses;
- The National Trust;
- Natural Resources Wales.

2.1. Organisational overview

Pembrokeshire County Council/Cyngor Sir Benfro is the Local Authority responsible for providing services in the Welsh unitary authority of Pembrokeshire. The county is home to Pembrokeshire Coast National Park, the only national park in the United Kingdom established primarily because of the coastline; the Park occupies more than a third of the area of the county and includes the Preseli Hills in the north as well as the 186-mile (299 km) Pembrokeshire Coast Path Trail. Industry is focused on agriculture (86 per cent of land use), oil and gas, and tourism; and Pembrokeshire's beaches are iconic and have won many awards.

Pembrokeshire County Council's headquarters are in the county town of Haverfordwest and the council employs 4,178 Full Time Equivalent Staff (FTE) as of March 2017. Pembrokeshire's population was 122,439 at the 2011 census, an increase of 7.2 per cent from the 2001 figure of 114,131. Ethnically, the county is 99 per cent white and, for historical

reasons, Welsh is more widely spoken in the north of the county than in the south. Welsh speakers form 19.2% of the county population. Around 22,000 people (18%) are under the age of 16 and 27,900 (23%) are aged 65 and over.

The Council is responsible for maintaining nearly 2,500 km of roads, 575 km of footways, 670 bridges and culverts and 230 highway retaining structures.

2.1.1. Demographics

Consultants PACEC produced an 'Overview of the Economy and Trends' as part of the Pembrokeshire Economic Development Strategy. This is used as the basis for our consideration of local characteristics, with additional information provided where relevant, including information for the St David's Peninsula area (comprising of the electoral wards of St David's, Solva and Camrose).

Population

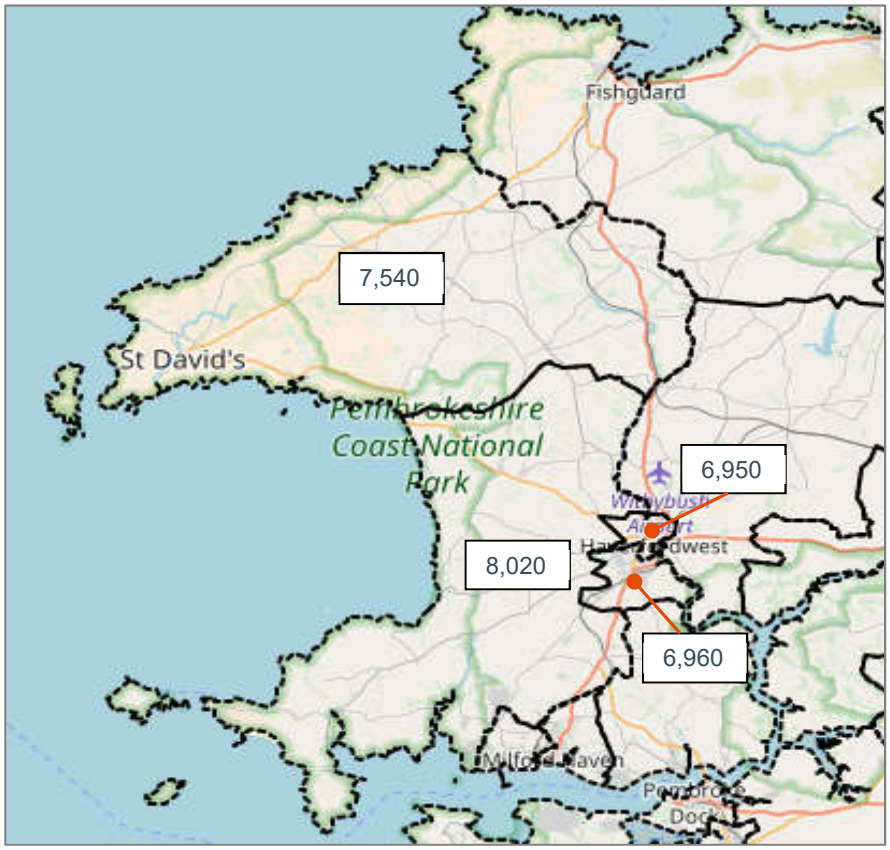
Within Pembrokeshire:

- Haverfordwest is the largest settlement with approximately 15,000 people.
- St David's city itself has a population of approximately 1,840 (Census 2011) and the city its surrounding area has a population of approximately 14,300[1].
- Pembrokeshire's population is split (Census 2011) as 75:25 rural to urban settlement, with an overall population density of 0.8 which is very low relatively (compared to the national level).
- Other areas along the A487 are typically small. None of the other areas around 'the road' have a population over 5,000 until Fishguard to the north.

For the area studied around the A487 via Newgale, we have gathered 2011 Census population estimates by MSOAs[2] for a population size of 29,500. This reflects around a quarter of Pembrokeshire's total population. Figure 2-2 below demonstrates the population estimates for the four areas.

[1] St David's City 2021 UK City of Culture bid document
[2] ONS Census geography https://www.ons.gov.uk/methodology/geography/ukgeographies/censusgeography

Figure 2-2 MSOA population estimates



Source: NOMIS Census 2011 population estimates, by MSOA, Pembrokeshire 003, 005, 006 and 008

Age and health

- The proportion of the population aged 20-39 is significantly lower in Pembrokeshire than in Great Britain, and the proportion aged over 55 is higher. This is driven by significant outmigration to seek higher education and employment outside Pembrokeshire (PACEC, 2016);
- Of the area about the A487 via Newgale, Haverfordwest has a younger population with 28% over 55 and 26% aged 20-39 than the other localities. St David's has 43% of its population over 55, which is high compared to Wales at 31%. As a whole, the Study Area has 22% aged 20-39, compared to Wales at 25%, and 34% aged over 55;
- The 2011 Census suggests that the proportion of the population that are retired is greater in Pembrokeshire (7%) than for England and Wales (4.9%);
- Data from the 2011 Census show that 22% of the population of Pembrokeshire have a long-term illness or disability that limits their day-to-day activities, the same as the share for Wales but more than the rate of 17% across England & Wales.

Car use

- Both the local areas and Pembrokeshire have high levels of access to a car or van, as recorded in the 2011 Census. Only 7% of the Camrose population, 18% of the St David's population and 11% of the Solva population lived in households with no car or van, compared to 18% in Pembrokeshire and 23% in Wales;
- For the MSOA Study Area, 18% have no car or van in the household;
- This trend is also true amongst the population with a disability or long-term illness, with much lower shares of this group having no car or van in their household than compared to the England and Wales level. However, individuals with no car or van in their household are more likely to also have a long-term illness or disability. The share of those with no car or van that have a disability or long-term illness is 41% in Pembrokeshire, compared to 39% in Wales and 30% in England & Wales.

Language

- The St David's city has 29%[3] of the population as Welsh speakers and a higher proportion are 65 or over (23%);[4]
- The area of study has an overall level of 20% Welsh speakers, with lower levels in Camrose (16%) and Haverfordwest (14%). There are pockets of higher Welsh speaking in rural areas with 24% speaking Welsh in Solva.

2.1.2. Labour market

- Pembrokeshire has 42,000 employees and a further 12,000 self-employed. The employment rate in Pembrokeshire is similar to Wales as a whole (45% in 2011), but there are more self-employed people and fewer full-time employees;
- The most recent data suggest the unemployment rate was 4.6% in Pembrokeshire and 4.7% in Wales (ONS Annual Population Survey July 2016-June 2017);
- The 2011 Census indicates part-time employment is 33% in Pembrokeshire which is greater than in England & Wales (29%);

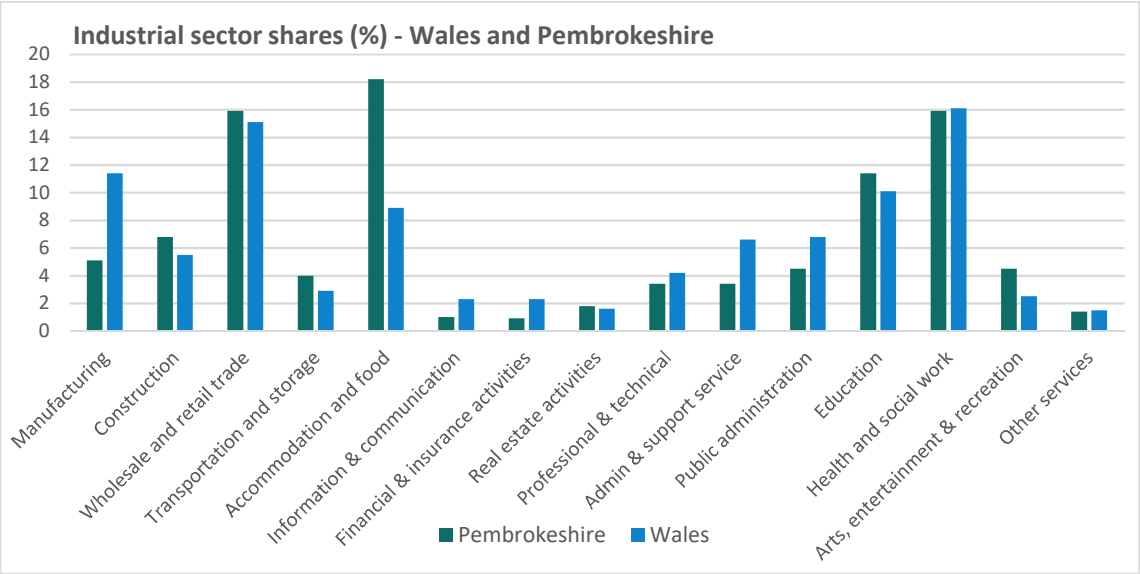
Travel to work

- There are relatively low levels of in/out commuting. 34,600 people live and work within the County; roughly 5,000 people commute out and 4,100 commute in. On average, interviewed firms had 94% of their staff resident in Pembrokeshire (PACEC, 2016). This data is also available from the 2011 Census by method of travel to work. Of the 34,600 who live and work within Pembrokeshire, 81% travel by car, van or motorcycle. 4% travel by bus, minibus or coach, by far the most common mode of public transport;
- Around 600 troops are based at Cawdor Barracks which is the base of the 14th Signals Regiment.

Sectoral

- Pembrokeshire has a high concentration of employment in extractive industries, accommodation and food service activities, arts, entertainment and recreation and construction. Employment is low in information and communication and financial and insurance sectors. Tourism is therefore a significant sector and specialism for the County (PACEC, 2016);
- Key local sectors of employment in Pembrokeshire are wholesale and retail, accommodation and food services, education and health services. The sectoral breakdown is shown compared to Wales in Figure 2-3 below.

Figure 2-3 Industrial sector shares (%) Wales and Pembrokeshire



[3] 2011 Census, https://statswales.gov.uk

[4] St David's City 2021 UK City of Culture bid document

BRES data for 2016 indicates the area of study has similar sectoral breakdowns, where its key employment sectors are construction (3.5%), retail (12%), accommodation and food (12%), education (12%) and health (27%).

Skills

- 31% of Pembrokeshire's 16-64 population have NVQ Level 4 or above, which is lower than Wales (35%) and Great Britain (38%);
- 9% of the Pembrokeshire's 16-64 population have no qualifications, which is slightly higher than Wales (8.7%);
- 37% of Pembrokeshire's employment is in SOC levels 1-3 employment, relating to managerial and professional occupations, compared to 40% for Wales. Most of Pembrokeshire's employment is in this grouping, whilst 15% are in skilled trades compared to 12% for Wales.

Wages

- The average gross annual wage for Pembrokeshire's residents is £24,180, which is lower than Wales at £26,327;
- The workplace average gross wage is £23,581 for Pembrokeshire, which is slightly lower than the residential average reflecting higher paid jobs available to residents outside the county.

2.1.3. Economic activity

West Pembrokeshire is characterised by a high level of out migration by young people and strong seasonal economic activity in low GVA sectors. Productivity in the area is also a challenge, where the St David's 2021 UK City of Culture bid notes that by 2010 productivity in south west Wales was at 94% of the Welsh level, and provided two main factors for this - the sectoral mix of the economy is geared towards lower value sectors and the nature of occupations within those sectors are generally of lower value than elsewhere.

Further:

- GVA per job for Pembrokeshire is estimated at £36,400 in 2013, compared to £39,700 for Wales and £50,800 for Great Britain (PACEC, 2016);
- Similar to the rest of Wales and Great Britain, micro-enterprises make up the majority (75%) of businesses in Pembrokeshire (PACEC, 2016);
- The five-year business survival rate is stronger in Pembrokeshire, at 46%, than for Wales and Great Britain at approximately 40%.

2.2. Business strategies

There are several local, regional, stakeholder and national policies and strategies which are influential in developing this case for investment.

2.2.1. Local and regional strategies

2.2.1.1. Pembrokeshire County Council

Pembrokeshire County Council is the Lead Local Flood Authority (LLFA) for its administrative area as well as being the Highways Authority, Coast Protection Authority and Civil Contingencies Authority. Under the Flood Risk Regulations 2009 it has duties, including:

- The preparation of local flood risk management strategies;
- A duty to comply with the National Strategy;
- To co-operate with other authorities, including sharing data;
- A duty to investigate all flooding within its area, insofar as a LLFA consider it necessary or appropriate;
- A duty to maintain a register of structures and features likely to affect flood risk; and,
- A duty to contribute to sustainable development.
- Pembrokeshire County Council also has the following policies, plans and documents:

Newgale Adaptation Plan Strategy Report, Atkins (5147092-DG04), July 2017

The Strategy Report presents the case for adaptation, setting out underlying principles and evidence, describing the process and examining options. From this Strategy Report a managed route of actions are identified as a way forward for the community to establish as responses to the changing landscape.

Pembrokeshire County Council, Local Development Plan (LDP) 2013-2021

Amongst key trends and issues identified in the LDP is improving access to goods and services due to limited public transport and inadequate access within the County. The A487 is identified as part of the Strategic Road Network in the county (Figures 3 and 5).

Roch and Simpson Cross are identified as service villages in the settlement hierarchy. Keeston is identified as a large local village. Penycwm and Pelcomb Cross are identified in the hierarchy as small local villages. Roch and Simpson Cross are identified for development of 44 and 11 homes respectively under policy GN.27, 20% of which are to be affordable housing. There are no other proposed development sites in the vicinity. Under Policy GN.16, visitor attractions and leisure facilities will be permitted where the site is well located in relation to A or B class roads and/or bus routes, suggesting the A487 could be significant for supporting development of the visitor economy in the region.

Pembrokeshire County Council Local Development Plan Draft Review Report (September 2017)

The Draft Review Report of the Pembrokeshire County Council LDP identified delivery of safeguarded transport routes as an area for concern. The Report also includes proposal for a Shared Use Path (SUP) from Pelcomb Bridge to Pelcomb Cross and Simpson Cross to Roch.

The Pembrokeshire Destination Management Plan

The above report contains a tourism strategy, intended as a development guide for all Pembrokeshire based organisations, businesses and employees in tourism related roles.

The Pembrokeshire Economic Development Strategy and Action Plan 2017-2022, PACEC.

In the context of drivers of change in Pembrokeshire, the County's "relatively poor local transport network' is described as a weakness. Growth and diversification of the tourism sector are identified as opportunities for the County's economy, with the Pembrokeshire coastal path identified specially as an opportunity for diversification.

The Economic Development Strategy identifies six priority themes including:

- Inward Investment: Tourism is a key source of investment, however there are issues with access to markets;
- Transport and Communications Infrastructure: This refers to the A487 as providing road access into the north (Ceredigion) through the coastal settlements of Fishguard and Newport. The Strategy states that the rural bus network requires improvement, relevant due to the 411 and 400 services which serve Newgale and the A487;
- Improve sites, premises and physical regeneration: Recognising the significance of employment in the tourism sector, this highlights the importance of developing premises, facilities, accommodation and attractions in the County. Newgale contains several tourism businesses and accommodation, served by the A487.

Destination Pembrokeshire Partnership. Pembrokeshire Destination Management Plan 2013-2018

The Plan highlights the significance and quality of Pembrokeshire's coast and the risks of insufficient investment in facilities in the context of increased competition from other destinations, nationally and worldwide. Actions in the plan include becoming a market leader in land and water-based activity holidays, which is already being practiced in Newgale, and improving access to the countryside where appropriate, with specific reference to the Pembrokeshire Coast Path National Trail. Improving public transport and disabled access to the coast are also identified as actions.

Pembrokeshire County Council Single Integrated Plan 2013-2018

The Single Integrated Plan (SIP) is due to be replaced by a Pembrokeshire Well-being Plan, currently under preparation by the Pembrokeshire Public Services Board. The SIP highlights that the agricultural, food and tourism sectors are significant employers and have concentrated local supply chains. Infrastructure investment, including in the road network, is required to support the economy.

Arwain Sir Benfro – LEADER Local Development Strategy 2014-2020

LEADER (Arwain in Welsh) is a European Union rural development programme, funded by EU development funding and with projects managed by Local Action Groups. The Sir Benfro (Pembrokeshire) LEADER Local Development Strategy 2014-2020 notes the issue of isolation from services, job opportunities and activities as issues due to rurality, exacerbated by lack of public transport.

Themes identified under the strategy include exploring new ways of providing local services, including community transport, for which the existing local road network is likely to be critical. Other project themes including adding value to local identity, natural and cultural resources (including increasing sustainable tourism opportunities) and facilitation of local supply chains, with the road network likely enabling infrastructure for both activities.

At the time of writing (January 2018) it is not clear how the UK's departure from the European Union will affect available regional funding.

St David's (Hundred of Dewisland) City of Culture Bid 2021

The bid highlights the cultural and environmental assets of the St David's Peninsula, including 21 sites of Special Scientific Interest, 4 Special Areas of Conservation, a Special Protection Area, 2 Blue Flag beaches, 2 Green Coast awards and 4 Seaside awards. The area also contains prehistoric and iron age structures, as well as St David's Cathedral amongst other attractions. Roch Castle is highlighted as an important asset. The bid recognises that local SMEs require support, including in terms of infrastructure provision. The bid refers to the world class coastal landscape, and related activities such as walking, as a key part of the area's offer.

Pembrokeshire County Council Corporate Plan (2017-2018)

The Corporate Plan is PCC's plan for the future and sets out plans to manage services in a more sustainable way. The Plan is a requirement of the Well-being of Future Generations (Wales) Act 2015.

The Corporate Plan is structured around five Well-being objectives:

- Raising overall standards of achievement;
- Healthy communities: Communities supported by affordable and appropriate housing; Improving social care;
- Increase the economy's productivity and address regeneration issues;
- Safeguarding our environment;
- Self-sustained and vibrant communities.

2.2.1.2. Pembrokeshire Coast National Park

Pembrokeshire Coast National Park Authority are the Planning Authority. Land use planning within the National Park area is wholly the responsibility of the National Park Authority.

The purposes and duties of the National Parks in England and Wales are laid down by statute as set out in The Environment Act 1995 which also imposes duties upon all public authorities with functions within the area of the Park to pursue the purposes of the Park. There is a requirement to 'Conserve and enhance the natural beauty, wildlife and cultural heritage' of the Park and to 'Promote opportunities for the understanding and enjoyment of the special qualities of national parks by the public'. These are underpinned by the Sandford Principle which asserts the primacy of the first purpose over the second in cases of irreconcilable conflict. Reflecting that National Parks are living landscapes with a resident population, there is a duty to foster the economic and social well-being of communities within the National Park. This duty should be fulfilled in the pursuit of National Park Purposes.

Within the context of these purposes there is a duty to foster the economic and social well-being of local communities. Development should be compatible with National Park Purposes. In National Parks special considerations apply to major development proposals. When considering such proposals there is a need to assess:

- The need for the development and the impact of permitting or refusing it on the local economy;
- The cost of and scope for providing the development outside the designated area or meeting the need for it in another way; and
- Any detrimental effect on the environment and the landscape, and the extent to which that could be moderated.

The Pembrokeshire Coast Local Development Plan (PCLDP) was adopted in September 2010. The PCLDP is currently the development plan for the National Park therefore decisions on planning applications within the National Park must be taken in accordance with that development plan unless there are material considerations that indicate otherwise.

Other key planning guidance is contained within:

- Pembrokeshire Coast National Park Authority Landscape Character Assessment Supplementary Planning Guidance (SPG);
- Pembrokeshire Coast National Park Authority Seascape Character Assessment – Supplementary Planning Guidance to the Local Development Plan for the Pembrokeshire Coast National Park.

Pembrokeshire Coast National Park, Local Development Plan (LDP) 2010-2021

The Pembrokeshire Coast National Park LDP identifies Newgale, Solva and Roch as 'rural centres'. Issues for rural centres include lack of public transport. The Plan's vision for rural centres in 2021 is that local facilities are sustained and

that travel to larger centres for day to day needs is no longer needed, however that accessibility to larger centres, such as via the A487 to Haverfordwest or St David's, has improved.

St David's is identified as a 'local centre' within the LDP. The town and its peninsula "forms one of the most important tourism resources in the National Park" (p. 27).

Pembrokeshire Coast National Park Local Development Plan Review Report (June 2016)

The review of the PCNP LDP in June 2016 concluded that a full revision of the LDP is required due to issues in delivering housing, affordable housing and other land use allocations. The Review Report includes reference to the Newgale Adaptation Plan and the need to consider a defined route for a new road link at Newgale in future reviews of the Plan.

Pembrokeshire Coast National Park, Local Development Plan (LDP) Preferred Strategy for 2015-31 (May 2017)

The Local Development Plan is currently being reviewed and it is anticipated that the replacement plan will be adopted late in 2019. The Deposit Plan version of the replacement Local Development Plan is now in consultation (between 6 April 2018 and 1 June 2018). The Deposit Plan does for the first time, contain policies identifying Coastal Risk Management Areas and policies to assist with coastal adaption and relocation of existing permanent dwellings or facilities affected by coastal change (Policies 37 and 38). One of the areas identified is Newgale.

The Pembrokeshire Coast National Park LDP Preferred Strategy also sets out 19 strategic policies to meet its vision. The strategic policy around rural centres is described above, with local facilities so that travel is not necessary, but with improved accessibility to larger centres.

Further, the emerging LDP has policies including the visitor economy (Policy 35) where visitor accommodation will not be added substantively but there will be a focus on providing quality and a range of options. Visitor attractions are set to be directed to the Centres with countryside locations reserved for those for which a countryside location is essential. The employment sites policy (Policy 42) encourages business extensions and the need to join existing clusters of employment in the countryside. Sustainable transport policy aims to encourage improved traffic management, encouraging public transport, and ensuring development is well designed in terms of accessing a site.

Pembrokeshire Coast National Park Management Plan 2015-2019

The management plan features policies to protect the special characteristics of the National Park with policies across people, livelihoods, conservation, historic environment, earth heritage, air and water quality, low carbon economy and park access. These include a commitment to protect Pembrokeshire's land areas of tranquillity, where this includes noise pollution among other aspects. Polices also cover air quality, whilst the park currently meets its objectives there has been an upward trend of nitrogen dioxide associated with vehicle emissions. This relates to regional and national objectives, such as from Natural Resources Wales, in reducing the need for cars. This is done by ensuring, as far as possible, that new housing is built where it is supported by sufficient facilities and services to meet the needs of communities, including public transport provision.

Pembrokeshire Coast Path National Trial

- The Pembrokeshire Coast Path is a spectacular 186 mile (299 km) long National Trail covering some of the most varied coastal scenery in Britain, stretching from St Dogmaels in the north, passing through Newgale and onto Amroth in the south. Both the Wales Coast Path and the International Appalachian Trail follow the route of the Pembrokeshire Coast Path through Pembrokeshire.
- PCNPA maintain the Coast Path with funding from Natural Resources Wales and the Welsh Government.

2.2.1.3. Regional Policy

Swansea Bay City Region: Economic Regeneration Strategy 2013-2030

The strategy highlights that the Swansea Bay City Region is a major driver of the Welsh economy, in part due to its major tourism assets and leisure attractions. However, there is a productivity gap with the rest of the UK, due to high shares of low value sectors and occupations.

The Strategy notes that strategic transport links in the West of the City Region are under-developed, limiting the potential for internal commuting and business-to-business linkages. Poor transport links are also raised in relation to deprivation, exacerbated by physical isolation.

Specific to the tourism sector, employment in the tourism-related accommodation and food services sector in the region is forecast by Cambridge Econometrics to increase by around 50%, and GVA by over 40% in the period 2012-2030. An

operational aim related to 'Strategic Aim 5: Distinctive Places and Competitive Infrastructures' is to develop and implement a coherent framework for the engagement of visitor and investor audiences, including establishing a consistent visitor proposition combining high quality and integrated National Park, Coastal, Rural and City offers. Strategic road connectivity to key coastal and rural assets from major centres, as provided by the A487, is likely to be key to this.

Swansea Bay City Deal (2017)

The Swansea Bay City Deal was agreed by the UK Government, Welsh Government and Swansea Bay City Region Board in March 2017. It will provide £1.3 billion of funding over 15 years, of which £637 million is from the private sector, £241 million from the Welsh and UK Governments and £396 million from other public sector organisations. The theme is the "Internet Coast", and the City Deal covers projects across Swansea, Neath Port Talbot, Carmarthenshire and Pembrokeshire. These come under four themes, the Internet of Economic Acceleration; the Internet of Energy; the Internet of Life Science and Wellbeing; and Smart Manufacturing.

Interventions focus on the digital and smart manufacturing sectors, with little consideration of transport infrastructure or western Pembrokeshire.

'Pembroke Dock Marine' is one of the 11 projects, and will see site regeneration (Marine Energy Test Area, Wave Demonstration Zone, Marine Energy Engineering Centre of Excellence) to enable developers to test, manufacture and maintain offshore renewable energy devices. A second project that sites within Pembrokeshire is 'Homes as Power Stations', a new house build and retrofit programme that can develop and attract new sector supply chains of high value manufacturing and construction, ultimately creating new industry in the region.

Joint Transport Plan for South West Wales 2015-2020

The Joint Transport Plan covers the four local authorities which constitute the Swansea Bay City Region (Carmarthenshire, Neath Port Talbot, Pembrokeshire and Swansea). The A487 is plotted as part of the region's Strategic Road Network. The Plan includes the Northwest Shared Use Path (SUP) link to Haverfordwest, which covers a similar route as the A487, as a proposed scheme. This Path will complete missing sections of SUP linking the town with communities to the northwest, i.e. Pelcomb Bridge to Pelcomb Cross, and Simpsons Cross to Roch. The Transport Plan also sets out some safe cycling route expansions, highlighting opportunities for sustainable travel around the area for both residents and visitors.

Plans in Pembrokeshire also include strategic upgrades of Fishguard Harbour and the expansion of Haverfordwest airport.

2.2.2. Key stakeholder strategies

2.2.2.1. National Trust

The National Trust in one of the principal landowners in the region and this includes Southwood Estate, which it has managed since 2003. A small part of the estate backs onto the coast at Maidenhall Point.

National Trust Shifting Shores – Playing our part at the coast 2015

The National Trust cares for 775 miles of coastline around England, Wales and Northern Ireland. In 2005 the National Trust investigate how the coastline was likely to change over the next 100 years and their Shifting Shores report committed the Trust to working the natural process and adapting to coastal change, rather than relying on solely building defences on the coast. This strategy was strengthened in 2015 so that by 2020 there will be coastal adaptation strategies in place as a framework to inform community engagement and decision making for 80 coastal locations. This strategy will also:

- Seek to build strong relationships with vulnerable communities, stakeholders and partnerships to realise coastal adaptation projects;
- Build coastal adaptation into the National Trust long-term business planning – recognising that the challenges of managing coastal change will play out over decades not years;
- Provide training on coastal change management and adaptation to ensure the National Trust staff and volunteers have the right knowledge and skills.
- All of these strategies align with the Newgale Adaptation Plan.

Playing our part – National Trust strategy to 2025 (2015)

The National Trust has produced a strategy to deal with the challenges that climate change will bring, to provide the best experiences of history, beauty and nature and finding new ways to help look after the places and spaces that people enjoy. Through this strategy the Trust are committed to working with other organisations, landowners and the public to deliver projects for landscape conservation.

Vision for the Southwood Estate (2013)

The regeneration planned for the Southwood Estate shares some common aims with the Newgale Adaption Plan, namely;

"To introduce a new network of public rights of way to the heart of the estate where there has hither-to been none. This will link communities to the coast, and provide people with an insight into a previously hidden landscape."

2.2.3. Natural Resources Wales

Natural Resources Wales is a Risk Management Authority for Wales and responsible for taking a strategic overview of the management of all sources of flooding in Wales. They provide advice to the Welsh Government and have prepared strategic plans which set out how to manage risk. Additionally, they provide support to other RMAs and the Lead Local Flood Authorities through the development of risk management skills and provide a framework to support local delivery of flood risk management. NRW are flood risk Category One responders (Civil Contingencies Act 2004).

NRW also maintain the outfall to Brandy Brook – a designated "Main River" at Newgale to prevent flooding of local properties, the camp site and the road.

2.2.4. National or functional strategies

2.2.4.1. National

Europe 2020

Europe 2020 states that European nations should focus on economic growth that is 'smart, sustainable and inclusive'. Inclusive growth refers to ensuring growth maintains and delivers social and territorial cohesion, which may be of particular relevance to relatively peripheral rural locations such as Newgale.

2.2.4.2. Welsh Government (WG)

The Welsh Government's National Strategy for Flood and Coastal Erosion Risk Management (FCERM), 2011

The FCERM sets out the WGs objectives on flood and coastal erosion risk management and provides the policy framework to help public bodies, communities and other organisations work together to manage flood risk.

The National Strategy recognises that it is not possible to prevent all flooding and coastal erosion and builds on the principles of the Welsh Government's previous 'New Approaches Programme' which marked a move away from using traditional coastal defences to managing the risks of coastal flooding and erosion. The Strategy gives an overview of responsibilities for all of the organisations involved in managing the risks of coastal flooding and erosion (Figure 1) and sets out four key objectives:

- Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
- Raising awareness of and engaging people in the response to flood and coastal erosion risk;
- Providing an effective and sustained response to flood and coastal erosion events; and
- Prioritising investment in the most-at-risk communities.

The Welsh Government provides capital and revenue funding for Natural Resources Wales and for local authorities to manage the risks of coastal flooding and erosion. The Welsh Government allocates funding through two programmes:

- The **Flood and Coastal Investment Programme** will allocate funding to Natural Resources Wales and councils based on national priorities.
- The **Coastal Risk Management Programme** will provide capital funding to support council coastal protection schemes delivered between 2018-19 and 2020-21.

West of Wales Shoreline Management Plan (2012)

Each of the four second edition Shoreline Management Plans (SMP2) for Wales were approved by the Minister for Natural Resources between October and December 2014.

The West of Wales SMP highlights that Newgale is amongst the key areas of increasing flood risk and that increasing Sea Level Rise potentially opens large areas to increased risk to the Newgale valley.

Table 2-1 below shows that for the two policy units affecting the coastal frontage of the A487 that there is a policy of managed realignment in place, with no active intervention planned for the frontage of Newgale Village from 2105.

Table 2-1 SMP2 policy for Newgale

Policy Unit	Policy Plan	2025	2055	2105	Comment
2.11	Newgale Sands north	MR	MR	NAI	Manage shingle on the road but with the long-term intent of allowing the shingle ridge to behave naturally.
2.12	Newgale village	MR	MR	MR	Manage the cliffs and position of the stream to sustain the upper village.
Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention, MR – Managed Realignment					

The SMP also highlights that the coastal erosion rates for Newgale Sands over a 100-year period are in the range of 15-60m, but that the shingle ridge would appear much as it is at present.

Within the coast of West Wales there are a number of sites (outside of Newgale) where managed realignment could be considered but the resulting development of inter-tidal saltmarsh and mudflats would result in the loss of coastal grazing marsh. Managed Realignment at these sites can only be progressed once the legally required compensatory habitats have been created. Through the Adaptation Plan for Newgale there is potential for compensatory habitat to be created which will allow other coastal defence projects to be built elsewhere.

The Environment (Wales) Act (2016)

The Environment (Wales) Act (2016), became law in March 2016. It puts in place legislation to plan and manage the natural resources of Wales in a pro-active, sustainable and joined-up way. It also seeks to establish a more resilient Wales and provides the legislative framework to tackle climate change. Central to the Act is the need to manage Wales' natural resources in an integrated way to achieve long term sustainability and deliver multiple benefits for people and nature, both now and in the longer term.

The principles of the Act will guide the way in which all RMAs in Wales develop and plan their approach to FCERM. Future schemes will need to consider where and how they can deliver other environmental, economic and social benefits and not just focus on floods. However, the Act should also help facilitate opportunities for FCERM to influence and benefit from projects where other drivers, for example biodiversity or recreation is the lead, to ensure flood mitigation is also considered.

Future Landscapes: Delivering for Wales (2017)

The Independent Review of Designated Landscapes in Wales, commissioned by the Welsh Government, reported in the summer of 2015. This report made many recommendations covering proposals and observations on purposes, principles, vision, governance models, planning and funding.

The Future Landscapes Wales Working Group was established to explore the Review recommendations and the case for change. Future Landscapes: Delivering for Wales (2017) sees designated landscapes on a path to drive the sustainable management of natural resources in their areas and working beyond their current boundaries, opportunities for genuine partnership and collaboration and advocates greater flexibility in structures in order to meet the needs of places and communities.

However, WG policy on protected landscapes the Policy Statement for National Parks and National Park Authorities (March 2007) was the last policy statement issued by Welsh Government (replaced Welsh Office Circular 13/99) remains in place and no changes to legislation have yet arisen from the Future Landscapes strategy.

Welsh Government (2017): Prosperity for All: Economic Action Plan

The Economic plan seeks to grow the economy inclusively, spreading opportunity and promoting well-being across communities. The Economic Plan identifies four 'foundation' sectors including tourism. The document recognises that in parts of Wales, particularly rural areas, these sectors comprise the local economy. The document also recognises the role of the National Parks in acting as regional economic catalysts. Tourism has a major economic role in Pembrokeshire, and the A487 is a strategic route in accessing tourism assets like the Pembrokeshire Coast Path and the St David's Peninsula.

Welsh Government (2010): Economic Renewal: A New Direction

The 2017 Economic Action Plan builds on the Economic Renewal plan set out by the Welsh Government in 2010. This provided a vision for economic renewal built upon: '*the strengths and skills of its people and natural environment; recognised at home and abroad as confident, creative and ambitious; a great place to live and work*'. This recognised the need for investment in sustainable infrastructure to underpin economic growth and wellbeing. It further stated that people, businesses and communities need to be well-connected within and beyond Wales, and to have access to the right facilities and services where they live and work.

The A487 provides such connectivity to the local communities, including those in smaller rural areas, supporting wellbeing and inclusive economic growth.

Welsh Government (2016): Planning Policy Wales 9e

Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. Relevant policies cover transport, natural heritage, infrastructure, environment and tourism.

Section 4 states that planning policies, decisions and proposals should 'Foster improvements to transport facilities and services which maintain or improve accessibility to services and facilities, secure employment, economic and environmental objectives and improve safety and amenity'.

Section 4.6.3 brings together both themes in identifying priorities for rural areas including:

- Sustainable rural communities with access to affordable housing and high quality public services;
- A thriving and diverse local economy where agriculture-related activities are complemented by sustainable tourism and other forms of employment in a working countryside; and
- An attractive, ecologically rich and accessible countryside in which the environment and biodiversity are conserved and enhanced.

Section 5 considers conserving and improving natural heritage and the coast and its capacity to sustain economic activity and to provide enjoyment and inspiration.

Section 11 identifies tourism as vital to economic prosperity and job creation and this should be supported. Tourism and sports and recreation facilities (such as outdoor activities) should be accessible to all for inclusive. Specific mention is made of long distance footpaths.

Section 12 identifies the need to consider the vulnerability of infrastructure and services to severe weather events and that infrastructure is designed to cope with higher average temperatures and increasing risk of storm surges, drought and flooding.

Section 13 identifies policy to minimise and manage environmental risks such as flood risk and climate change, taking account of these risk in development plans and development management.

The A487 supports rural communities in Pembrokeshire in accessing services in St David's and Haverfordwest as well as supporting the local tourism sector.

Welsh Government (2008): Wales Spatial Plan Update

The Spatial Plan Update (SPU) provides the context and direction of travel for local development plans.

Chapter 13 ('Achieving Sustainable Accessibility') notes that access to job opportunities and public services "is of particular concern for those who face barriers to accessibility, such as people on low incomes, young and old people, disabled people and those living in rural areas". The area around St Bride's Bay is identified in the top 10% most access-deprived areas (as is much of west, central and north Wales).

Chapter 18 focuses on the 'Pembrokeshire – the Haven' spatial plan area. The route from Haverfordwest to St David's Peninsula is identified as providing regional connectivity. St David's itself is identified as a local centre and a tourism focus. The entire coastline is identified as having coastal tourism potential, and the St David's Peninsula and St Bride's Bay are identified as an environmental asset of national importance (p. 82). St Bides Bay has two Blue Flag beaches. Key strategic priorities for the area include:

Overcoming the Area's peripherality by improving strategic transport links and economic infrastructure including improved telecommunication links, and maximising the potential of the Area's maritime assets and proximity to Ireland;

Increasing higher value-adding economic activities, particularly in the rural economy, by developing an all-year, high quality tourism and leisure sector;

Development of the Area's three strategic hubs (Pembroke-Milford Haven-Haverfordwest, Fishguard-Goodwick, and Carmarthen) and spreading benefit and growth to the wider hinterlands and smaller rural communities;

Protecting and enhancing the Area's important environmental assets, maximising their potential through exemplary sustainable development.

The Wales Transport Strategy 2008: Connecting the Nation

This is the key transport policy instrument in Wales. The WTS sets out the wider social, economic and environmental outcomes to which transport contributes and identifies strategic priorities. This therefore details the strategic objectives relevant for all transport policies and proposals in Wales.

The overall goal identified in the WTS is 'to promote sustainable transport networks that safeguard the environment while strengthening our country's economic and social life. Our transport strategy identifies a series of high-level outcomes and sets out the steps to their delivery.'

The strategy sets out long term outcomes as social, economic and environmental targets. These are summarised in the table below:

Area	Long term outcomes
Social	• Improve access to healthcare, education, training and lifelong learning • Improve access to shopping and leisure facilities • Encourage healthy lifestyles • Improve the actual and perceived safety of travel
Economic	• Improve access to employment opportunities • Improve connectivity within Wales and internationally • Improve the efficient, reliable and sustainable movement of people • Improve the efficient, reliable and sustainable movement of freight • Improve access to visitor attractions
Environmental	• Increase the use of more sustainable materials • Reduce the contribution of transport to greenhouse gas emissions • Adapt to the impacts of climate change • Improve the impact of transport on the local environment, heritage and biodiversity

The A487 via Newgale aligns with several of these outcomes, by:

Providing access to healthcare, education and leisure facilities for local residents;

Providing access to employment opportunities for local residents i.e. in connecting people to the economic centre of Haverfordwest;

Enabling the movement of people and freight, but with reducing reliability given the environmental changes i.e. occasional flooding;

Providing access to visitor attractions such as St David's cultural attractions, beaches and heritage assets.

Whilst environmental outcomes regarding climate change adaptation, emissions and impact on biodiversity need will be considered in future options for 'the road'.

The alignment to these outcomes is developed in subsequent sections covering 'the road's value to residents, businesses and visitors.

Welsh Government Strategy for Tourism 2013-2020

The Strategy recognises that as well as its economic significance, tourism has a key role to play in reinforcing Wales as a place to visit, invest and do business in; it is also a key export industry. The Strategy contains the ambition to grow tourism earnings in Wales by 10% or more by 2020. One of the actions to achieve this ambition is promoting improved transport links by air, sea, road and rail.

Well-being of Future Generations (Wales) Act 2015

This Act intends to improve the social, economic, environmental and cultural well-being of Wales by ensuring consideration of the long-term, working better with people and communities and taking a more joined up approach. The Act sets out 7 goals for Wales:

- A prosperous Wales;
- A resilient Wales;
- A healthier Wales;
- A more equal Wales;
- A Wales of cohesive communities;
- A Wales of vibrant culture and thriving Welsh Language; and
- A globally responsible Wales.

At the heart of the Act is the principle of 'sustainable development' and a more informed and better decision-making process for Wales. Public bodies must consider the long-term impacts of all their decision making and actions. There is also a duty to work better together - with each other and with communities - to enable a more joined up approach to preventing future problems.

The South West Wales Joint Transport Plan (JTP)

The South West Wales Joint Transport Plan (JTP) covers the period 2015-2020, on behalf of the Swansea Bay City Region, which is a partnership comprising of the following local authorities:

- Pembrokeshire;
- Carmarthenshire;
- Swansea;
- Neath Port Talbot.

The JTP identifies the vision for transport in South West Wales: 'To improve transport and access within and beyond the region to facilitate economic regeneration, reduce deprivation and support the development and use of more sustainable and healthier modes of transport' reflecting the City Region Board's priority of sustainable economic regeneration.

Part B: The case for change

Newgale is on the A487 between Haverfordwest and St David's where the road crosses the valley of the Brandy Brook. It is defended from the sea by a shingle bank formed as a storm beach and which is considered to be a relict feature of sea level rise following the end of the last ice age.

The West of Wales Shoreline Management Plan (SMP) which received its final approval from the Welsh Minister in December 2014 following extensive public consultation, identified the area of Newgale as vulnerable. The SMP reported that attempting to sufficiently stabilise the shingle bank, behind which the road runs across the valley, would require major intervention. This would destroy the natural feature, creating a narrow shingle backshore similar to that along the northern part of Broad Haven and that the A487 road running out to the north would need substantial protection works.

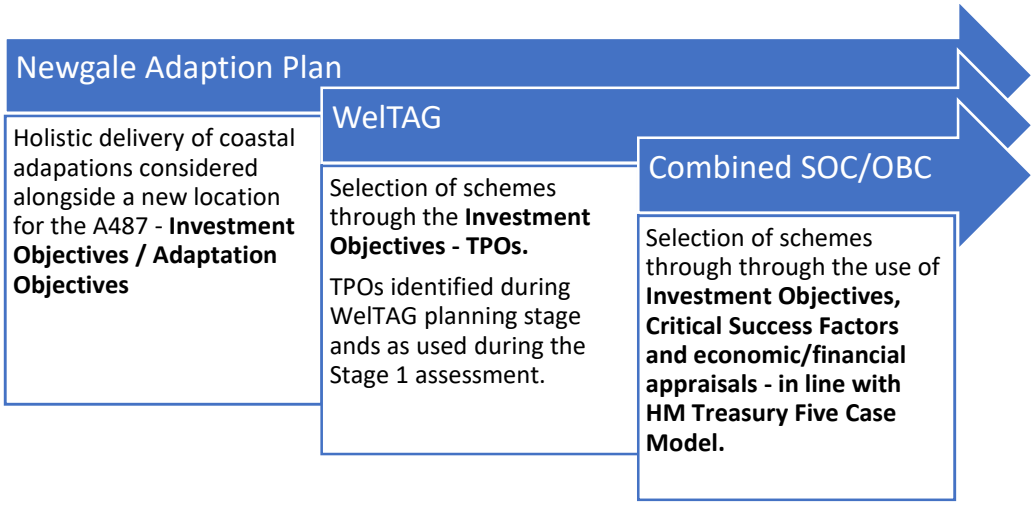
A Royal HaskoningDHV (December 2014) report concluded that the shingle bank will become increasing unstable and vulnerable to failure. It is anticipated that it will be unsustainable in a timescale of 10-20 years, due to unacceptably high risk of failure, the high cost of more frequent closures and maintenance that arise culminating in the loss of the road infrastructure.

The need to move the road (irrespective of the route finally chosen) and the policy of allowing the coast to respond naturally leaves a requirement to plan how the implications of these changes are managed. This creates a need to look at the broader community issues and impacts and to consider how change may affect the area and how services can be sustained. Newgale Adaptation Plan (July 2017) identified several locations that require adaptation in order to retain the vitality of the community at Newgale.

Looking further afield, it is acknowledged that the A487 is vital for the regional economy. The economy suffers loss from the road closures which currently occur and these losses will increase in frequency and scale due the impacts of climate change. The complete loss of the road will strike a further blow to the regional economy unless alternative routes are provided.

2.3. Investment objectives

The Investment Objectives (IO) will be used to evaluate the long list of projects that will be required as a result of the consequences of the coastal adaptation. The IOs have been developed from 2 separate pathways i.e. the investment objectives detailed through Transport Planning Objectives (TPOs) in the WelTAG study and secondly, the investment objectives detailed through Adaptation Objectives (AOs) developed in the Adaption Plan, with a view to provide a more integrated/holistic approach to the delivery of the road realignment and coastal adaptations.



2.3.1. WelTAG Transport Planning Objectives

Transport Planning Objectives (TPOs) were identified in the Planning Stage report, based on the review of problems, constraints and opportunities identified by consultees and a review of available data; together with strategic objectives contained in the Wales Transport Strategy (WTS) and the South West Wales Joint Transport Plan (JTP). These TPO's

(along with potential options) were presented for public consultation in October and November 2015. As a result of feedback from that consultation the wording of the TPO's were strengthened as follows:

Table 2-2 WelTAG Transport Planning Objectives

Ref.	Transport Planning Objective
TPO1	To improve sustainable long-term highway connectivity to and within the local community and between St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal erosion;
TPO2	To conserve and enhance the natural beauty, wildlife and cultural heritage of the Pembrokeshire Coast National Park avoiding, or at least minimising, adverse effects on the natural environment caused by traffic and associated infrastructure;
TPO3	To improve the actual and perceived safety of the transport network in the study area for all users and residents;
TPO4	To make the transport network suitable to facilitate tourism and regeneration in the St David's Peninsula including access to the coast at Newgale; and
TPO5	To support and facilitate the safe movement of vulnerable road users to their destination.

TPO2 is focussed on the National Park and stems from one of the two statutory purposes for National Parks in England and Wales as set out in The Environment Act 1995: 'Conserve and enhance the natural beauty, wildlife and cultural heritage'.

The other statutory purpose of National Parks is to 'Promote opportunities for the understanding and enjoyment of the special qualities of national parks by the public' and this is captured in TPO4. These are underpinned by the Sandford Principle which asserts the primacy of the first purpose over the second in cases of irreconcilable conflict. Reflecting that National Parks are living landscapes with a resident population, there is a duty to foster the economic and social well-being of communities within the National Park. This duty should be fulfilled in the pursuit of National Park Purposes.

National Park Authorities have been set up to pursue these purposes, and other public bodies and other relevant authorities have a statutory duty to have regard to these purposes.

These two statutory purposes are primary considerations for the Pembrokeshire Coast National Park Authority or any other public body in the evaluation of any proposals coming forward. The National Park Local Development Plan (adopted 2010) sets out the land-use planning strategy, policies and proposals for the National Park. Policy 15 of the Plan (Conservation of the National Park) protects the qualities and special character of the National Park, to ensure they are not lost to future generations. Policy 8 of the Plan identifies the special qualities of the National Park. Further detail on landscape and seascape considerations is provided in the National Park Authority's adopted Supplementary Planning Guidance on Landscape Character (2011) and Seascape Character (2013).

In National Parks special considerations apply to major development proposals. When considering such proposals there is a need to assess:

- The need for the development and the impact of permitting or refusing it on the local economy
- The cost of and scope for providing the development outside the designated area or meeting the need for it in another way; and
- Any detrimental effect on the environment and the landscape, and the extent to which that could be moderated.

2.3.2. Adaptation Objectives from the Newgale Adaption Plan

The Plan has been developed with and for the local community through active discussion and involvement throughout the process. This Plan will, however, need to evolve and be updated as the Community take forward the management of change. The Plan has to be a continuing process.

The starting point for adaptation is to understand the key elements and factors which make Newgale the place it is, how they relate to each other and how they could be affected by change.

A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis was carried out in early stages and additional local knowledge from neighbours and other local stakeholders was collated during two open sessions (Sounding Boards 1 and 2).

The feedback from these meetings helped to identify some recurrent topics in terms of values, concerns and potential opportunities. Some of the key values highlighted were:-

- The importance of 'The View' as you arrive on the A487;
- That any interventions continue to be low key, with landscape quality taking precedence; and
- Access to the beach and the coastline is maintained.

These highlighted attributes which mirror the Pembrokeshire Coast National Park purposes - conserving the natural environment, promoting opportunities for enjoyment of the area, and in pursuit of the Purposes, considering the economic and social well-being of the local community. This is a positive framework within which developing ideas for the future can come forward.

Alongside this, key features of the area were identified. These features contribute in different ways to the functioning and activity of the village and the area of the Newgale valley and coast – often relating to multiple areas of village activity.

Based on this analysis, a number of fundamental themes emerged during the conversations with the community, but all within an emerging vision for the future, as summarised below:-

The residents of Newgale want to continue to live within an outward looking, active community that sustains business, engages with tourism and embraces the changing natural landscape. They seek to maintain its connection to the beach and ensure that connectivity between the north and south parts of the village is not compromised as a result of coastal change.

Community vitality has been continuously highlighted as a priority for the village. The local community values being part of a vibrant destination for visitors that bring dynamism to the area and contribute to sustain facilities and recreational activities. The concern of not becoming a quiet "dead-end" was recurrently raised during community involvement sessions. This primary ambition has been translated into a number of specific objectives in the Strategy as shown in Table 2-3 below:

Table 2-3 Adaptation Objectives from the Newgale Adaption Plan

Ref.	Adaptation Objective
A01	Ensuring connectivity with the rest of Pembrokeshire
A02	Maintaining physical and functional links between northern and southern edges of Newgale
A03	Maintaining connection to the beach
A04	Maintaining and enhancing the natural environment
A05	Sustaining community well-being and empowering locals to take a lead role in adapting to change
A06	Sustaining of business opportunities
A07	Supporting tourism

2.3.3. The Investment Objectives for the scheme

Drawing from the Investment Objectives in Table 2-2 and Table 2-3, the following list of Investment Objectives (IO) will be used to evaluate the list of coastal adaption projects that will come forward as a result of the realignment of the road.

The Investment Objectives were discussed by the Newgale Action Group of stakeholders at a workshop held on 23 January 2018 at County Hall, Haverfordwest. The Well-being goals helped set the Investment Objectives.

Table 2-4 Investment Objectives

Ref.	Investment Objectives
IO1	To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.
IO2	To provide the optimal solution in terms of impact to the Pembrokeshire Coast National Park.
IO3	To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.
IO4	To protect the fabric, community, iconic nature and visual aspect of Newgale, while allowing the natural evolution of the coastline.
IO5	To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.

2.4. Existing arrangements

2.4.1. Existing highway network

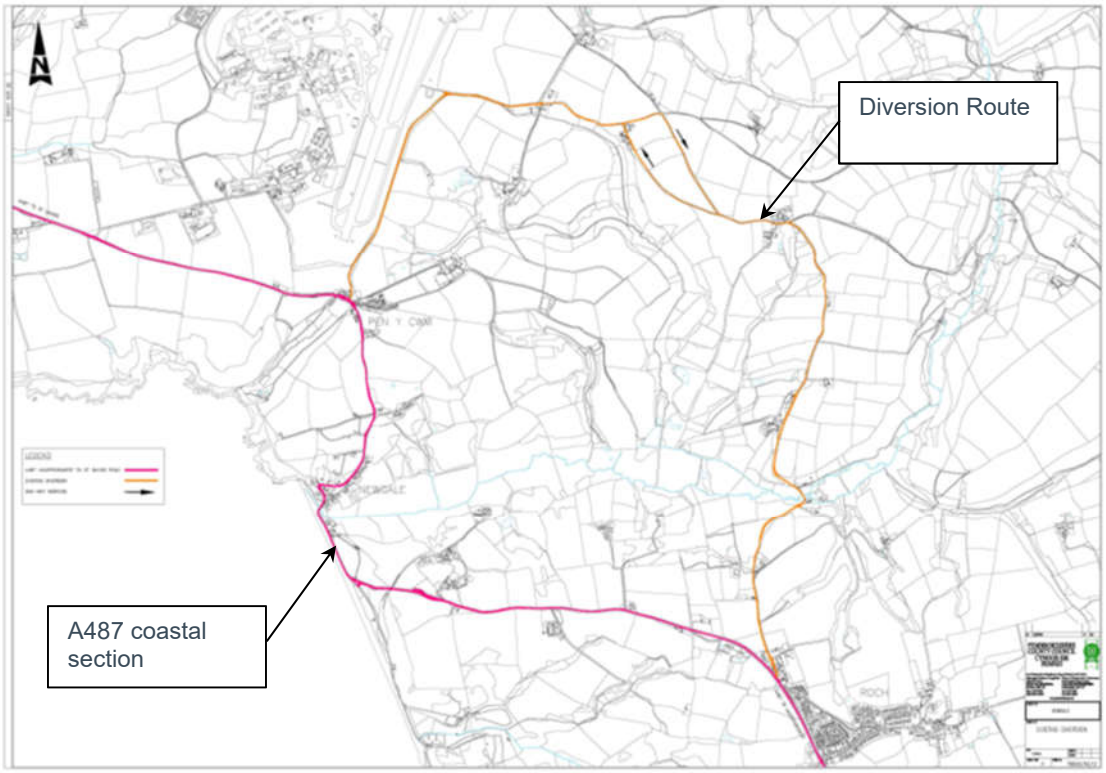
The main road leading to and running through Newgale is the A487. This road is an important part of the County Road Network linking Haverfordwest with the St David's Peninsula providing access to a number of settlements, most notably Newgale, Solva and St David's and the hinterland of the St David's Peninsula. The road helps to fulfil one of the statutory purposes of the National Park by providing the opportunity to access and enjoy the special qualities of the National Park. The road terminates at Fishguard to the north-east.

The section of A487 in the vicinity of Newgale is single carriageway running from Roch to Penycwm. The road passes through Newgale on the eastern side of the shingle bank immediately adjacent to the coast. Speed restrictions of 30 and 40mph are in place along parts of this section of route.

The shingle bank at Newgale in the Pembrokeshire Coast National Park, provides coastal protection for the A487 and the village of Newgale. In the winter storms of 2013/14 the shingle bank was overtopped and the A487 flooded.

The shingle bank has been overtopped many times resulting in road closure and, with rising sea levels, this is expected to become a more frequent and severe event. When the road is closed, a 6.2km traffic diversion route through single lane rural roads via Roch and Penycwm are used. This route is not capable of carrying the high levels of diverted traffic and delivery of a transport solution is therefore required.

Figure 2-4 The existing A487 Newgale diversion route



2.4.1.1. Existing traffic conditions

The majority of traffic exhibited on the A487 in Newgale is through traffic heading to St David's (and Solva) in the north-west and to Haverfordwest in the south-east. The A487 is also the only diversion route for Heavy Goods Vehicles (HGVs) in the event of a major accident closing the A40 north of Haverfordwest.

2.4.1.2. Traffic flows

The Annual Average Daily Traffic (AADT) flow for the A487 through Newgale (along the seafront) is currently 4,177 (2017), comprising of 3% HGVs.

The AADT currently travelling along Welsh Road (C3082) is 1,256 (1% HGVs).

Along the minor roads C3010 (Penycwm) and C3062 (Roch Hill), the AADT is 488 (3% HGVs) and 82 (3% HGVs) respectively. However, flows along these roads can increase to circa 4,700 vehicles a day when the A487 through Newgale is closed. Due to the rural nature of these roads, with certain sections restricted to single lane working, both the C3010 and C3062 can become significantly congested when the A487 diversions are in place.

2.4.1.3. Average Speeds

The average speed of traffic currently travelling through Newgale (along the seafront with an associated 30mph speed limit in place) is approximately 22mph / 35kph.

On approach to Newgale from the south-east, the average speed of the A487 (between the junctions with Roch Hill and Welsh Road (C3082)) is c.40mph / 64kph (with the national 60mph speed limit in place for the majority). Exiting Newgale to the north, the average speed is c.34mph / 55kph (with a 40mph speed limit in place).

2.4.1.4. Accident rate

Personal Injury Accident (PIA) data for the study area was provided by Pembrokeshire County Council (PCC) for the period, covering 01/05/2011 to 30/05/2018 inclusive.

During this period, a total of nine accidents were reported. None were classified as 'fatal' whilst one was 'serious' and eight were 'slight'. The location of accidents, demonstrating the locations of slight accidents (green circles), serious accidents (blue squares), and also showing which ones involved pedestrians (red outline with added "P") are shown in Figure 2-5 and an additional PIA is just north-west of the study area.

Figure 2-5 Study Area Accident Plot

The accidents resulted in 16 casualties; none were classified as 'fatal', six were 'serious' (comprising of two vehicle drivers and four passengers) and 10 were 'slight' (comprising of two vehicle drivers, four passengers, one motorcyclist, two cyclists and one pedestrian).

Overall the accident rate is in keeping with what would be expected from a transport network of this type. However, 2 of the 4 collisions recorded along the A487 (Wood Hill) in Newgale were caused by objects on the road (assumed to be pebbles from the shingle back) whilst one was due to the road being flooded. Scheme proposals will therefore provide an opportunity to improve highway safety along the A487 in Newgale.

2.4.1.5. Bus

The scheduled bus routes that currently serve Newgale are the 411 service (running between Haverfordwest and St David's) and the 'Puffin Shuttle' coastal service No. 400 (running between St David's and Marloes). Both these services are currently operated by Richard Bros.

Monday to Saturday, there are approximately eleven 411 services a day, running in each direction between 0800 and 1900hrs (at differing minutes past the hour). In addition to servicing the general public, this service provides school transport for children attending primary and secondary schools in St David's.

From May to September the 400 service runs three times each day in each direction through Newgale Monday to Saturday. From October to April the 400 service only operates 2 days/week.

These services can be caught from one bus stop in each direction in Newgale or by 'hail & ride'.

2.4.2. Road closures due to storm damage

The impact when the road is affected to storms is such that it is necessary to close the road due to the flooding which takes place. In January 2014, a severe breach of the shingle bank on 2 January and over successive days resulted in a succession of road closures between 2 January and 10 January. On 2 February during a storm, a bus became trapped in floodwater and got hit by waves as the road was being closed. This resulted in a major operation to rescue ten passengers which had the potential for loss of life. A large clear-up operation was also required to reinstate the shingle bank.

The period between December 2013 and March 2014 was characterised by a succession of extreme storms in the Atlantic resulting in widespread coastal flooding. Between 2 January 2014 and 3 March 2014 there were around 16 days where the A487 at Newgale was closed on 9 different occasions.

2015 experienced road closures on 3 separate occasions (February, April and October) with the road closed for up to 4 days in total with follow up clear-up operations to remove shingle on the road.

In February 2016, the road was closed due to high winds due to Storm Imogen and a clear up operation took place to reopen the road. In 2017, between 17-21 October the road was again closed due to Hurricane Ophelia and a clear up operation required. In 2018 (to date), the road was closed in January and April due to high tides.

Even in minor flood events, the pub, café, campsite and surf ship are inaccessible and the road is closed. Traffic is also diverted away from the A487 which results in severe congestion along the diversion route.

Table 2-5 assumes a "Do Nothing" approach to shoreline management, in that no works would be undertaken to resist the movement of the shingle and that the only works undertaken would be to clear debris to keep the road open. The table below shows the likely frequency of road closures of different severity and is borne out in the record of road closures detailed in the paragraphs above. This report uses the assumption in the WelTAG report that by 2036 it is likely that road will not be in use, however the road may actually be maintained for longer than this if it is practical to do so.

Table 2-5 Summary of anticipated Do Nothing damages

Consequence (Years 0-20)	Chance of occurrence within any year
Road closure with requirement for road clearance (1 to 2 days)	1 in 1
Major road closure (1 to 2 weeks), with major requirement for road clearance and associated extensive flooding.	1 in 10
Failure of the bank, potential damage to the road (2 to 3 months)	1 in 100

2.4.3. Pedestrians, cyclists, equestrians and community

'Accessing the Park' is recognised as one of the 'Special Qualities of the National Park Landscape'. The landscape is easily accessed by visitors and residents due to the Pembrokeshire Coast Path National Trail (a 186 mile route along the

coast of Pembrokeshire), stretching along some of the most spectacular coastal scenery in Britain, but also over 500 miles (800kms) of public rights of way which pass through the Park.

The Pembrokeshire Coast Path, follows Welsh Road (C3082) and the A487 (Wood Hill) before continuing along the coast.

The National Cycle Network (NCN) Route 4, is a long distance route between London and Fishguard, via Reading, Bath, Bristol, Newport, Swansea, Carmarthen, Tenby, Haverfordwest and St David's. NCN Route 4 also passes through the Newgale area. The route is designated along Welsh Road (C3082) and the A487 (Wood Hill) through to west of Penycwm junction. This section of NCN Route 4 in Wales is part of the Celtic Trail. The current cycle route follows the existing road and there is an opportunity to consider either a segregated or off-road route within the coastal adaptation proposals, which will enhance the enjoyment and safety of this particular stretch of the cycle route.

There are a number of PRoWs and bridleways within the study area predominantly crossing open fields; including PRoWs PP5 1/1, PP5 37/1, PP5 36/1, PP5 42/2, PP80 32/1, PP80 32/2, PP80 31/1, PP80 20/1, PP5 2/2 and bridleway PP5 2/2. There are few roads within the village of Newgale, of which very few have footpaths.

The public rights of way and the cycle route identified above make a key contribution to fulfilling one of the statutory purposes of the National Park which is to promote opportunities for the public to understand and enjoy the special qualities of the park.

2.4.4. Environmental

A summary of the WelTAG desk study has been provided below to review the environmental risks, issues and opportunities.

All scheme options are wholly or partly within the Pembrokeshire Coast National Park. The 'Richness of Habitats and Biodiversity' is acknowledged to be one of the special qualities of the Pembrokeshire National Park landscape. The Landscape Character Assessment of the National Park which was adopted as Supplementary Planning Guidance to the Local Development Plan in June 2011 states: 'The abundance of wildlife – and the ability to get close to it – is one of the great attractions of the National Park'.

Information on statutory designated sites for biodiversity and earth heritage was obtained from the Multi-Agency Geographical Information for the Countryside (MAGIC) and http://lle.gov.wales websites in November 2016 and May 2017. The search area was extended to 30 km for European designated sites with bats as a qualifying feature and to include European designated sites where other pathways for impacts may occur, e.g. where hydrological links via waterways are present.

Table 2-6 Key environmental issues

No.	Key environmental issues	Potential mitigation measures
1	**European designated sites** Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston, SAC. North Pembrokeshire Woodlands SAC. St David's/Ty Ddewi SAC. Cleddau Rivers SAC. West Wales Marine cSAC. Pembrokeshire Marine/Sir Benfro Forol SAC and Ramsey and St David's Peninsula Coast SPA together comprise a number of internationally important coastal habitat features including maritime vegetation communities within reefs, sandbanks, mud flats and Atlantic salt meadows. These habitats ultimately help to support internationally important bird, seal and lamprey populations.	Assuming standard pollution prevention measures are implemented no impacts are anticipated the SACs and SPA identified. There are opportunities for abandonment of the existing road and sea defences which may allow creation of saline lagoons and establishment of natural coastal processes, possibly of benefit to Pembrokeshire Marine SAC. It is unlikely that at this distance away from the SACs, the option would have an impact on the roosting bats. However, if hedgerows are lost foraging and commuting bats could be impacted. This may be mitigated by planting of new hedgerows.
2	**SSSIs and National Parks within 2 km** St David's Peninsula Coast SSSI (part of the St David's Peninsula Coast SPA) comprises of important geological and biological features, namely lichens, invertebrates, Choughs and Peregrines and nationally important for grey seals. Newgale to Little Haven	Scheme selection should aim to reduce potential impacts on St David's Peninsula Coast SSSI through any noise/artificial light disturbance made around the bird nesting seasons for Choughs and Peregrines.

No.	Key environmental issues	Potential mitigation measures
	Coast SSSI is nationally important for its intertidal habitats and species. Pembrokeshire Coast National Park contains an assemblage of important coastal and terrestrial habitats supporting a range of notable and protected species. Western Cleddau Rivers SSSI is of special interest for otter, a range of fish species, as well as a variety of associated riverside habitats.	Assuming standard pollution prevention measures are carried out during construction no negative impacts are anticipated on SSSI sites. Scheme selection should reduce impacts to semi-natural habitats within Pembrokeshire Coast National Park.
3	**Floodplain marsh** Newgale Marsh[5] meets the criteria for SSSI selection as set out in the published guidelines for the selection of biological SSSIs[6]. The site has however not yet been designated as an SSSI, but for the purpose of this assessment this assemblage of habitats has been valued as of High importance.	Scheme selections should avoid significant loss of marsh wetland habitat from construction of a crossing over the flood plain which leads to habitat fragmentation. Standard forms of mitigation should be in place to prevent risk of pollution into Brandy Brook and stream tributaries during construction and operation affecting temporary disturbance of sediments during construction and also affect hydrological features such as flow of water across the habitat with the ability to alter the habitats. This has the potential to cause indirect impacts on Pembrokeshire Marine/Sir Benfro Forol SAC. There are opportunities for abandonment of the existing road and sea defences at Newgale will result in some tidal inundation at the west of the floodplain, allowing more natural coastal process to establish and allowing creation of habitats such as saline lagoons and wet woodland.
4	**Farmland habitats and notable species** Farmland habitats include grasslands, hedgerows, woodland, rivers and streams. These habitats have the potential to support a range of protected and notable species, which may include (but are not necessarily limited to): bats; badger; birds; slow worm; and a range of moths and butterflies.	Heart Covert, an area of ancient woodland on the Ancient Woodland Inventory lies adjacent to options proposed and may be affected by the Scheme. Impacts to this habitat through minor realignment of the road route and protection of habitat during construction, will be required. Scheme selection should consider loss of arable farmland, grassland pasture and hedgerows, loss and fragmentation of woodland pockets. The loss of water bodies should be minimised. Consideration should also be made of indirect loss/degradation of adjacent habitats as a result of noise and light generated during construction and operation.
5	**Landscape and townscape** The route options are all located within the Pembrokeshire Coast National Park and Pembrokeshire County. The A487 is the main road connecting Newgale with Haverfordwest and St David's, and the B4330 linking up with this and bounding the study area to the north east. Dramatic views are experienced along the A487 as it descends towards Newgale beach which would be characterised as being an unspoilt coastal and rural landscape. This 'Coastal Splendour' has been identified along with eleven other characteristics as Special Qualities of the National Park Landscape. The coastal landscape provides drama with the unusual relationship of high coast and lowland valley. This provides a high degree of exposure, a wide expanse of sea and influences the landscape character of the area, through sight and	The diversity of the landscape and the interface between landscape and ecology has been recognised during the WelTAG assessment process and the work being undertaken for the Coastal Adaptation Masterplan Strategy, with a recently commissioned Habitat Creation Study undertaken by Royal Haskoning DHV UK Ltd. As ongoing design work continues and options are refined a more exacting understanding of impacts will need to continue to be assessed. The special qualities of the landscape are all interrelated, as the strategic options are developed they will continue to be a focus of inter-related assessments moving forward. In assessing how the route options would affect the existing landscape, the following factors should be taken into account: The extent to which the road will be visible in the landscape, the character of the landscape and its capacity to accept change of the type and scale proposed and the extent to which impacts can be mitigated and the road can be integrated into the landscape.

[5] The area of floodplain extending east from Newgale to Roch Bridge.
[6] NRW (no date). Newgale Marsh: Managing a coastal valley wetland in the face of sea level rise

No.	Key environmental issues	Potential mitigation measures
	sound, the existing shingle bank screening the existing road. Landscape Designations include National Parks (NP), Areas of Outstanding Natural Beauty (AONB), Sites of Special Scientific Interest (SSSI) and Special Areas of Conservation (SAC), Special Protection Areas (SPA) and together with other areas of conservation and recreational networks of local, regional, national or European importance	
6	**Heritage** The Pembrokeshire Coast is designated as a Heritage Coast. There are a number of designated heritage assets within the study area and a wide range of non-designated assets. The heritage assets range from pre-historic, mediaeval and post-medieval periods.	Conserving the cultural heritage of the Pembrokeshire coast is one of the statutory purposes of the National Park. No physical impacts to any designated heritage assets are anticipated, but impacts on non-designated heritage assets due to some schemes options are anticipated.
7	**Water environment** There could be an impact from the scheme options on the water environment either during construction or operation. During construction, this could include physical disturbance of water features such as diversions of watercourses, culverting a watercourse, building in floodplains and spillages. During operation, there could be an impact on the water environment that could include pollution of the water features through routine runoff, discharge to groundwater, increased flooding, serious spillage risk or potential for enhancement of the existing water environment to meet Water Framework Directive standards.	Scheme options can have an adverse impact on flood risk without mitigation. This is related to potential construction and operational impacts to flood risk and the likelihood that without mitigation there could be an increase in flood risk to property. Standard mitigation in the form of flood attenuation and sustainable drainage systems could be employed and will offset some of the adverse impacts identified. Habitat creation could enhance the overall water quality and improve biodiversity.
8	**Coastal flood risk** Options selected near to the coast will be vulnerable to flooding and increasingly so with the effects of climate change.	In the absence of improved sea defences, to avoid the effects of coastal flooding and erosion, options should be on raised ground or set back away for the area of flood inundation. An assessment of the effects of climate change should be undertaken to establish the risk to the option over its anticipated design life.
9	**Noise** Traffic on the existing road network is the predominant cause of noise in the area. Roadside levels of noise in the study area is generally between 63 and 66 decibels. Additional sources of noise, including from farms and industrial estates, may affect particular properties at particular times. Residential properties located near roads in Roch, Penycwm and on Newgale Hill form the majority of the 264 receptors identified as sensitive to noise.	Options should be selected to reduce or not exceed the existing noise climate. Where adverse impacts for these options is created, this could be reduced through the use of noise mitigation.
10	**Air quality and Greenhouse Gas emissions** Pembrokeshire County Council (PCC) has declared two Air Quality Management Areas (AQMA), which are in Haverfordwest and Pembroke, approximately 12 and 20 kilometres to the south-east of the study area respectively. These AQMAs are not considered to be of relevance to this study area. Statutory ecological designations also help to define the sensitivity of the receiving environment of the	Options should be selected to limit any increase in the change in exhaust emissions as the result of the selection of a route option.

No.	Key environmental issues	Potential mitigation measures
	impact of changes in air pollution. In addition to being within the National Park, there are three statutory ecological designation within 200 m of the roads included in the study area. This includes St David's Peninsula Coast Site of Special Scientific Interest (SSSI) which is located approximately 40 metres north of the A487 Newgale Hill and the Pembrokeshire Marine SAC. Most receptors are residential properties located near to the roads in Roch, Newgale and Penycwm. There are several isolated properties in the study area.	
11	**Land use and soils** The options have the potential to impact on agricultural land use and on soils during construction and operation of the scheme. Potential impacts arising from loss, fragmentation or severance of land parcels.	Consider options which reduce land take by minimising the footprint of any scheme. For any soils temporarily disturbed during construction that will be outside the highway boundary, these should be restored to farming in a condition not worse than their existing state. For new routes, livestock and large agricultural machinery may have difficulty in crossing the road safely, mitigation will involve creating or restoring field and farm accesses or providing overbridges or underpasses. Where the latter are not provided the mitigation is installation of handling pens in gateways, wide gates set back to allow farm vehicles to pull off the carriageway and adequate turning splays.
12	**Land contamination** There are principal potential sources of contamination located in one or more route options i.e. The former Southwood Colliery, the former RAF Brawdy comprising a disused airfield and storage area, a former petrol filling station, sewage works, a former lime kiln and associated culm pits and numerous former quarries and pits which have potentially been infilled, and operational farms are located in the study areas of all route alignments.	A detailed desk study should be undertaken as a further assessment making use of a Landmark Envirocheck Report which provides more detailed land quality information and more in depth historical mapping and will enable better characterisation of the land on and around the route options. Depending on the findings of the desk study, a ground investigation may be required, with appropriate environmental sampling and laboratory analysis.

Options may have permanent changes to the landscape, and construction impacts such as noise will need to be mitigated through the implementation of either an Environmental Impact Assessment (EIA) and/or Environmental Action Plan (EAP).

2.4.5. Social

Table 2-7 Key social issues

No.	Key social issues	Potential mitigation measures
1	**Permeability** The construction of a new road has an effect on the degree to which non-motorised forms of transport can be used. Improving permeability, or reducing severance, can encourage healthier lifestyles and in this case, can promote enjoyment of the special qualities of the National Park by the public. Changes could occur as a result of removal of the beach road, the need for new highway crossings (increased severance) and removal of or reduction	It is expected that in the case of all options the Pembrokeshire Coastal Path and National Cycle Route 4 would be retained but would be set back outside of the active zone of coastal retreat. This would present the opportunity to improve NMU provision along the coast at Newgale in order to increase permeability. Walking, cycling and bridleway routes would be impacted by the proposed route options, but the impact

No.	Key social issues	Potential mitigation measures
	in vehicular traffic on a road resulting in a reduction in severance of non-motorised user (NMU) routes which cross that route. A public right of way (PRoW PP5/1) exists south of Penycwm and Bay View Farm, a bridleway (PP5 2/2) along Erw Lon between Penycwm in the west and Lower Llethr in the east and a PRoW (PP5 37/1) near Lower Llethr.	would depend on the proportion of use by residents and visitors.
2	**Social Inclusion** For the purpose of WelTAG, social inclusion is effectively synonymous with accessibility. Other factors such as deprivation or low educational attainment can often be even more important causes of social exclusion but in the context of transport proposals, the lack of accessibility is the main variable affecting social inclusion. Social inclusion impact assessment places particular emphasis on potential impacts on those people/social groups whose options in life are limited by not having the transport they would wish. This includes people on low incomes who have access to a car but may not be able to afford fuel to drive to where they want or need to go but primarily people without access to cars who rely on walking, cycling and public transport. Therefore, the social inclusion impacts are particularly interested in disadvantaged and possibly marginalised social groups and how they will be affected by the proposals. The key concern is to ensure that disadvantaged or vulnerable groups are not disproportionately adversely affected by the proposals. The Wales Transport Strategy sets out a number of outcomes, which include improved access to healthcare, education and training and life-long learning, shopping and leisure facilities, which are measured by national indicators linked to reducing travel time to enhance social inclusion.	The purpose of all options would be to provide a transport route which remains open during storm events. When compared to the do-nothing scenario, all the options would improve access to healthcare, education, shopping and leisure amenities in Haverfordwest and St David's. In this regard the impact of changes in accessibility on social inclusion would therefore be positive. Consideration needs to be given to bus services and although the No.411 and No.400 buses would have to re-route their services for routes which do not pass through Newgale, it is assumed that they will still stop in Newgale whereby buses will have to turn around in the village to re-join the main road again. The route options provide an opportunity to improve connectivity to essential services, particularly in respect of schools and health facilities. Potential changes to the downgrading of Withybush Hospital from a General Hospital may place greater reliance on providing routes which ensure reduced travel times. This will be particularly needed if the nearest future General Hospital is sited further east than Haverfordwest. Transport connectivity, works hand in hand with the investment in provision of services in local communities in order to supporting quality of life and economic outcomes of the area.
3	**Transport Safety** Transport safety aims to assess the extent to which the options will contribute to a reduction in the number and severity of accidents in order to enable a comparison of the relative merits of the standalone options.	The route options have an opportunity to improve highway safety as traffic is diverted away from Newgale, although routes need to consider the proximity to other settlements like Penycwm. In diverting traffic away from Newgale there will be a significant reduction in conflict levels between pedestrians/cyclists and vehicular traffic, particularly during the summer months.

2.5. Economic value of the existing road

2.5.1. Existing road value by different users

Appendix C presents the economic value of the A487 which serves the St David's Peninsula via Newgale, covering resident, business and visitor uses. This section details only the key information, findings and analysis from the appendix. The full Appendix C utilised defines study areas for the analysis. However, in this section we refer to the local area of the study more generally. The full appendix also presents information covering the existing road's strategic and policy fit, and details road traffic data to determine aspects of its value.

The following sections 2.5.2, 2.5.3 and 2.5.4 set out the three main types of road user – residents, businesses and visitors – it considers the available evidence and analysis on their road use and engagement, and the value of this use to the local area. For each user type we also consider the number and type of users on the A487 via Newgale. This information is then brought together in a summary at section 2.5.5 which assesses the economic value of the existing A487 via Newgale.

2.5.2. Residents

This section is informed by socio-economic data of the local area, feeding in information from Appendix C Section 4.1 and from the 2017 survey undertaken for the Newgale Coastal Adaptation Plan – 'WelTAG Report: Response Report'. It considers the value of the existing road to residents by understanding these residents, their uses of and their dependency on the A487.

2.5.2.1. Context of the A487 via Newgale for residents

Socio-economic context

The road network provides access for individuals across economic, health, education, community and leisure uses, which in turn bring socio-economic benefits and support wellbeing. As recognised in the Swansea Bay City Region Economic Regeneration Strategy, poor transport links relate to deprivation, and exacerbate physical isolation. This is magnified in a rural area where social and economic facilities can be clustered and are not all necessarily available in each smaller locality.

The Welsh Government's Economic Renewal approach[7] recognised the need for people, businesses and communities to be well-connected, and to have access to the right facilities and services where they live and work. The A487 via Newgale provides such connectivity for the local communities, supporting wellbeing and inclusivity. Accessibility to services and facilities is also a key feature of regional and national transport policies, where the Wales Transport Plan includes some relevant socio-economic objectives:

- Improve access to healthcare, education, training and lifelong learning;
- Improve access to shopping and leisure facilities;
- Encourage healthy lifestyles;
- Improve access to employment opportunities.

The area studied contains some notable facilities across health, education, shopping, leisure and employment uses. These are outlined in Table 2-8 below.

[7] 'Economic Renewal: A New Direction', 2010, Welsh Government

Table 2-8 Key local facilities for residents

Health	Education	Shopping and amenities	Leisure	Employment
Withybush General Hospital, Haverfordwest (A&E department) Winch Lane Surgery (Haverfordwest) St Thomas Surgery (Haverfordwest) St. David's Surgery Solva doctor's surgery	19 Primary schools 2 secondary schools 1 Special School – All age Pembrokeshire College campus, Haverfordwest	St David's, as a district centre – some, limited shop offering. 4 convenience, 24 comparison and 24 service units. 8 gift shops, 3 banks/ building societies.[8] Haverfordwest, as a principal town centre – more substantial shop offering. The highest ranked centre in Pembrokeshire. 88 comparison, 11 convenience, 67 service retail units[9]. Haverfordwest out of town retail provision also notable i.e. major names at retail parks[10]. Solva - limited retail opportunities. Focus on the tourism trade, with a few shops away from the harbour, including a post office and convenience store.	St David's – some, limited leisure with 6 galleries and 13 cafes, pubs & restaurants, in addition to the Cathedral. Expected continued development of visitor offerings. Haverfordwest – more substantial leisure. Leisure attractions such as bowling, trampolining centre, golf clubs, cinema, town museum - plus cafés, restaurants and pubs. Pembrokeshire National Park – outdoor activities, horse riding, walking, cycling, family events. A few galleries, craft and garden shops around the local centres of Solva and Haverfordwest. Blue flag beaches and beach activities - Newgale Beach; Whitesands beach, St David's	Haverfordwest cluster of businesses in town and out of town is the clear employment centre. St David's has some employment opportunities with local services i.e. banks, estate agents, professional service, health and tourist offices and retail.

The A487 via Newgale provides access for residents, especially those of the 'rural centres', to the economic centres of Haverfordwest and St David's as well as to schools, health facilities, leisure, community and natural assets. The Pembrokeshire LDP's 2021 vision is for local facilities to be sustained in rural centres so that travel to larger centres for day to day needs is no longer needed, whilst the accessibility to larger centres, such as via the A487 to Haverfordwest or

[8] Using the Retail Background Paper (2009), Pembrokeshire Coastal National Park
[9] 'County Wide Retail Study' (2010), Pembrokeshire County Council, GVA Grimley. Haverfordwest had though declined in its ranking over 2005-10, whilst Fishguard and Pembroke Dock increased. Unit type as of study, where comparison units include fashion, pharmacy, electrical/phones/hi-fi, pet goods, and cosmetics, hair and beauty.
[10] Also from the 'County Wide Retail Study' (2010). Major names include Marks & Spencer, Curry's, Next, Halfords, Morrisons.

St David's, has improved. Reduced travel time to such centres is a key outcome of the Wales Transport Strategy in order to enhance social inclusion. The future status of Withybush General Hospital is currently at consultation, with potential options being considered to downgrade Withybush to a Community Hospital and a new General Hospital being built further east (potentially at Whitland). This would place a further need to ensure that travel times for rural centres to the west of the General Hospital are minimised.

However, there are some current constraints in providing access to important facilities for all its communities. The St David's City of Culture bid noted the lack of access to services (those essential to everyday living), and to high-quality cultural services and experiences as a key issue for the population of the area. This was linked to the high level of out migration, and of wider deprivation. Transport connectivity, as well as provision of these services, is important to supporting quality of life and economic outcomes of the area. The area has relatively high car availability, though limited alternatives to car use on the A487 via Newgale. Social inclusion is an important consideration, alongside the economic access benefits, in assessing the value of the road.

2.5.2.2. How many residents

Demographic data is set out in Section 2.1.1, where the Pembrokeshire total population is approximately 124,000 people, and the **area studied, around St Bride's Bay, St David's and Haverfordwest, has a population of approximately 29,500**.

Pembrokeshire's population is estimated to remain largely stable from 2014 (123,700) to 2039 (122,400)[11].

In terms of residential car users, 18% of the area's households do not have a car or van available, in turn this relates to 82% of households **and approximately 21,000 people with car or van access[12].**

2.5.2.3. How residents value the existing road

In March 2017, a consultation survey ('WelTAG survey')[13] was undertaken to gather insights of the local community around their use of the A487 road and on the four options covered by the Newgale Coastal Adaptation Plan WelTAG report (Option 3b, J, 7 and 11).

This survey provides insights into the value of the A487 via Newgale for the local community. In total 138 response forms were received, and these are detailed in full in Appendix C.

Residential A487 use

Residents were asked why they would normally be using the A487, where they could select multiple answers. Table 2-9 below presents this breakdown of normal uses recorded, where we have also considered the likely frequency of this use.

Table 2-9 WelTAG survey - A487 uses

Use	Number	% of the responses	Likely frequency
Work	56	41%	Daily i.e. 5 return journeys a week
School/ college	11	8%	Daily i.e. 5 return journeys a week
Social visit / leisure	117	85%	Weekly, i.e. a few times a week
Shopping	97	70%	Weekly
Professional appointment	85	62%	Weekly, monthly
Other	19	14%	n/a
Total	385		n/a

Sources: Newgale Coastal Adaptation Plan WelTAG Report – Response Report; Atkins judgement. Multiple answers allowed so percentages do not sum to 100%.

[11] Wales 2014 Local Authority population projections
[12] From Census 2011 data, and presented in Appendix C, Section 2.
[13] Newgale Coastal Adaptation Plan WelTAG Report – Response Report, March 2017, Pembrokeshire County Council

The most common purpose for using the A487 (117 responses) is for social visits / leisure. This was followed by 97 responses indicating use of the A487 for shopping and a further 85 indicating the use of the A487 to attend professional appointments.

Approximately 85% of all residents stated using the A487 for social and leisure uses. These reflect important activities to enhance quality of life, such as through physical activity and community engagement. The A487 via Newgale is used by 41% of respondents for their work journeys. These are important flows for the likely daily journeys to access workplaces and economic centres in the wider area such as Haverfordwest.

Residential A487 use - transport mode

Survey participants were asked how they would normally be travelling along the A487, where they could select multiple answers. Table 2-10 presents this breakdown of normal use, where we have also considered any road implications.

Table 2-10 WelTAG survey - A487 mode

Mode	Number	% of the responses	Implication/ note
Own vehicle	133	96%	Mode with greatest traffic and environmental impact
Someone else's car/ vehicle	21	15%	
Taxi	5	4%	
Public or community bus service	42	30%	Important for non-car owners
School/college or social services transport	2	1%	
Walk	30	22%	May more easily be able to switch routes
Cycle	17	12%	May more easily be able to switch routes
Total	254	138	

Sources: Newgale Coastal Adaptation Plan WelTAG Report – Response Report; Atkins judgement

Of these the largest number (96%) indicated use of the A487 by own car or vehicle, as such a significant share of journeys are being made by private vehicles. The next most popular modal response was public buses (30%), and then walking (22%). Whilst walking and cycling use of the A487 may be more easily switched to other routes, the most common modal uses may be more dependent on this specific route using the A487.

Alternatives and impact

In considering whether there are alternatives, it depends on the purpose (Table 2-9), mode (Table 2-10) and the origin and destination. We considered the origin and destination flows of work journeys, where we find that there is a significant flow moving between the Haverfordwest and St David's areas (and points in-between) where the A487 via Newgale reflects the most efficient or only viable route for many of those journeys. This is detailed further under Section 2.5.3.

The WelTAG survey also provides an insight into impact from a change to the A487, where the coastal situation will inevitably enforce change on the A487's continued use in the Do Nothing case. Table 2-11 presents the breakdown of answers of whether there would be an impact from this change (and a subsequent new road option), by different areas.

Table 2-11 WelTAG survey - A487 Options impact

Affected area	Yes	No	Don't know	% Yes
Your home	42	68	6	36%
Your local business	21	64	6	23%
Your local organisation	10	63	6	13%
Other	12	43	8	19%
Total	85	238	26	24%

Source: Newgale Coastal Adaptation Plan WelTAG Report – Response Report; Atkins

In total 85 resident responses indicated that one or more of the four alternates to the existing road would have an impact on their home (42 responses), business (21 responses), local organisations (10 responses) and/or 'other' (12 responses).

Where residents responded yes, they were then asked to provide further details. These responses are qualitative and of the 85 positive responses there were 55 comments made. Table 2-12 summarises some key, common points made, by impact area.

Table 2-12 Qualitative impacts for residents

Home / individual	Business	Organisation
Common impact areas		
Longer journey times and congestion on rural roads		
Beach access is important and may be impacted		
Impact on views, noise and air pollution		
Impact on rural and quiet nature of area		
Area specific		
House prices and loss of property land and value Lack of privacy	Customers reside in Solva and Newgale	Loss of key meeting place and community hub i.e. Duke of Edinburgh pub
Access to health facilities; impacts on locals with health issues and disabilities with public transport and/or longer routes and worsened access	Business viability decreases and they will close	Access to health facilities; impacts on locals with health issues and disabilities with public transport and/or longer routes and worsened access
Loss of the vital link to St David's and the East	Loss of the vital link to St David's and the East	
Movement to Haverfordwest for school students	Impact on and loss of working farms	
	Impact on tourism business (i.e. campsite, surf, shop, inn)	

Source: Newgale Coastal Adaptation Plan WelTAG Report – Response Report; Atkins

These impact responses reveal the value of the A487 via Newgale as it currently is. Over two thirds of residents said it would impact them individually, nearly a quarter said local businesses and a fifth stated other areas of impact.

These impacts do not reflect the situation of no road but rather the impacts of an alternative road. As such, they underestimate the full value of the existing road. The survey provides a qualitative insight into how residents value the A487 via Newgale, whilst there are a series of local facilities across employment, health, education, social, leisure and natural assets that are accessible.

2.5.2.4. Economic value of resident use

Accessibility to economic, health, education, social, leisure and natural assets is difficult to measure and value. However, it has clearly emerged as a key aspect of road value for residents. We consider the economic value of workplace access in Section 2.5.3.

The residents survey found 36% stated there would a key impact from the provision of an alternative to the existing A487 via Newgale. The full value of the road will relate to a comparison to there being no road. To qualitatively capture the value of the A487 via Newgale to residents, we set out the relevant areas of value from Table 2-12 above with a judgement as to how crucial the road is to these ends in Table 2-13 below. We reflect the criticality of the A487 via Newgale with a value level judged as high, medium or low, with a rationale provided.

Table 2-13 Road value to residents in the WelTAG survey

Value	Level	Rationale
Beach and natural environment access	Low	'The road' provides access to PCNP and the beach for residents, but the Coastal Path and other walking and cycling routes also provide this for residents. 'The road' provides value for residents with health issues who may rely on 'the road' to reach these natural assets. 'The road' may be more important for visitor access here.
Access to health facilities	Medium	This was commented multiple times as an area of impact in the resident survey.
Access to education	Medium	This was commented multiple times as an area of impact in the resident survey. 8% of residents stated this as a normal use for 'the road'.
Access to St David's and the East	Medium	St David's offers less services and facilities than Haverfordwest for residents, and may be more valuable for resident's leisure time and for visitors to the Study Area.
Access to Haverfordwest	High	Haverfordwest as the county town and economic centre provides a multitude of facilities for those in the rural centres of the Study Area. These include: workplaces across different sectors, primary and secondary schools, Withybush General Hospital, leisure destinations, train station etc. A significant share of residents (85%) stated social visit/leisure and 70% stated shopping as normal uses for 'the road'.
Access to other localities	Medium	A key value here is in social inclusion where connection between smaller areas can maintain social connections. 85% of the survey residents listed 'social visit/leisure' as a normal use of 'the road'. The smaller areas of the Study Area provide different offerings, for example Solva provides a Doctor's surgery and some leisure based business, Roch provides a school and Newgale the beach.

Source: Atkins

2.5.2.5. Resident use summary

The Pembrokeshire LDP aims to provide service and facility provision, alongside transport development, so that travel to larger centres is not necessary for residents but is available. The current socio-economic geography of the area studied means that the A487 serving St David's Peninsula via Newgale is important in providing access to a range of services and facilities for residents, as well as to employment centres.

The WelTAG survey showed the high level of road use where over 40% are using 'the road' daily for work or education journeys. 85% of residents are using 'the road' regularly for social visits and leisure purposes, 70% for shopping and 62% for professional appointments. These reflect important activities to quality of life and economic and social wellbeing.

The A487 serving the St David's Peninsula via Newgale has a significant value to individuals and the area's communities, especially those in the smaller centres such as Newgale.

2.5.3. Businesses

This section is informed by socio-economic and Experian business data for the local area and from the 2018 Business survey undertaken by Pembrokeshire County Council – '*Business and organisations survey: assessing the value of the A487 via Newgale*'[14]. This section feeds in information from Appendix C, Section 4.2. It considers the value of the existing road to local business operations by understanding these business, their different uses and road dependency. A total economic value for the A487 in terms of GVA is calculated by extrapolating turnover from the business and organisations survey and turnover information available for the whole of the local area.

2.5.3.1. Context of the A487 via Newgale for business

The local business community is a key user group for the A487 via Newgale. As such, the economic case of the existing road (Appendix C) considers the level of business use of the road - how many businesses use the road, how often and why – and assigns an economic value related to business road use.

Businesses typically engage with the road network for supply chain movements and market and customer access, as well as with staff travelling to and from work. The road network can be critical for business. Some of the businesses in the area will also rely on the road for passing trade such as those in the tourism, accommodation and food service sectors.

Pembrokeshire is characterised by a significant share of lower value and tourism sector businesses whereby, especially in rural areas, accessibility and passing trade is important.

National, regional and local policy documents draw out the importance of connectivity in supporting the economies of rural centres. The Wales Transport Plan sets out several economic objectives, including: improve access to employment opportunities; improve connectivity within Wales and internationally; and improve the efficient, reliable and sustainable movement of people and freight. The objectives of the Transport Plan are relevant for Pembrokeshire's businesses and the A487 has a role in meeting these.

The Swansea Bay City Region Economic Regeneration Strategy highlights that strategic transport links in the West of the City Region are under-developed, limiting the potential for internal commuting and business-to-business linkages.

2.5.3.2. How many and what type of businesses

Understanding the local businesses that use the A487 via Newgale for their operations helps provide insight into the value of the road in supporting this revenue generation and employment.

To help determine this, Atkins obtained local business data from Experian[15]. Whilst recognising businesses from the wider area may also use this route to access the Pembrokeshire coast and St David's, it was important to define study areas for the business analysis. These are set out in the full Appendix C, and we consider the local area here as covering St Bride's Bay, St David's Peninsula and Haverfordwest[16]. **There were 3,213 businesses in the area. These are predominately small businesses, with 95% having under 20 employees**.

[14] 'Business and organisations survey: assessing the value of the A487 via Newgale'; Atkins & Pembrokeshire County Council; 2018
[15] Experian business data for Postcodes SA61 and SA62, latest data (2016) and purchased January 2018.
[16] This is Study Area 1 of the business analysis, covering postcode areas SA61_1, SA61_2, SA62_3, SA62_4, SA62_5 and SA62_6.

Details of the top business sectors in the local area are provided in Table 2-14 below.

Table 2-14 Sector shares of businesses, employees and turnover

Study Area 1 top sectors by business count		Study Area 1 top sectors by employees		Study Area 1 top sectors by turnover	
J: Information and communication	15%	Q: Health and social work	21%	G: Wholesale and retail	45%
G: Wholesale and retail	14%	G: Wholesale and retail	18%	A: Agriculture	13%
I: Accommodation and food services	10%	I: Accommodation and food services	12%	I: Accommodation and food services	11%
A: Agriculture, forestry and fishing	10%	P: Education	12%	C: Manufacturing	9%
M: Professional, scientific and technical activities	7%	C: Manufacturing F: Construction A: Agriculture	5%	F: Construction	4%

Source: Experian 2016; Atkins. Sample size: 3,130 businesses, and 1,390 business with local turnover data

Health and education organisations reflect key employers, whilst wholesale and retail; accommodation and food services; and agriculture are consistently top-ranking sectors for the local area. Agriculture includes some important local services with high operational levels such as dairy and milk supplies. Manufacturing and construction are also shown to be significant local sectors.

In considering how important the A487 via Newgale is for these businesses and activities, we have undertaken a business survey and this is discussed further below.

We have also undertaken a high-level qualitative assessment of sector road use, as shown in Table 2-15 below. We have judged each key sector's typical level of road use as low, medium or high. This has been based on relevant experience and professional judgement.

Table 2-15 Qualitative overview of sector road use

Sector	How road use is typically required	Operational level of use
A: Agriculture, forestry and fishing	• Delivery of produce	Medium
C: Manufacturing	• Suppliers delivery • Delivery of output	High
F: Construction	• Travelling to sites (clients) • Supplies transport	Medium
G: Wholesale and retail trade	• Suppliers delivery • Travelling from customers • Delivery of output	High
I: Accommodation and food services	• Suppliers delivery • Travelling from customers • Local tourism importance	High
M: Professional, scientific and technical activities	• Travelling to sites (clients) • Supplies transport	Low
P: Education	• Travelling to school of students and teachers	Low
Q: Health and social work	• Travelling to and from users	Low
R: Arts, entertainment and recreation	• Travelling from customers • Local tourism importance	Medium

Source: Atkins

This indicates that a significant share of local businesses, employment and turnover has a significant operational use of the road network.

Understanding the employment and turnover of the local businesses who use the A487 for their operations helps provide insight into the value of the A487 via Newgale. The business survey is combined with the following analysis to assign economic value of the A487 via Newgale in supporting employment and revenue generation in Section 2.5.3.4.

Employees

The number of employees identified within the local area businesses is 14,206 employees, according to the Experian data. As noted in section 2.1.2, the 2011 Census showed that at least **85% travel to work by modes using the road network**.

For employment travel to work analysis, we have used DataShine Commute information based on the 2011 census data which identifies the relative size of the origins and commuting routes. Significant flows are coming from various origins towards Haverfordwest for work, reflecting its importance as a county town and local economic centre. There is a reasonable flow from the St David's area (A487 via Newgale route) to work destinations.

Table 2-16 below presents the commuter flow data, showing the routes between St David's and Haverfordwest areas, i.e. for the Pembrokeshire 003, 005 and 006 MSOAs.

Table 2-16 Travel to work flows for A487 via Newgale

Origin-destination of travel to work (MSOA)	Share of origin total	Share of work destination total
Haverfordwest (Pembrokeshire 005) > St David's (Pembrokeshire 003)	7% (of the work flows starting from 005)	10% (of the work flows ending at 003)
Haverfordwest (Pembrokeshire 006) > St David's (Pembrokeshire 003)	4%	6%
St David's (Pembrokeshire 003) > Haverfordwest (Pembrokeshire 005)	18%	6%
St David's (Pembrokeshire 003) > Haverfordwest (Pembrokeshire 006)	6%	5%

Source: DataShine Commute

This table demonstrates the significant share of home origin and work destinations that the St David's (003) and Haverfordwest (005 and 006) route has. In particular, the work route from St David's to the Northern area of Haverfordwest (005) relates to 18% of the work flows starting from St David's, and 6% of all of Haverfordwest's work destination flows.

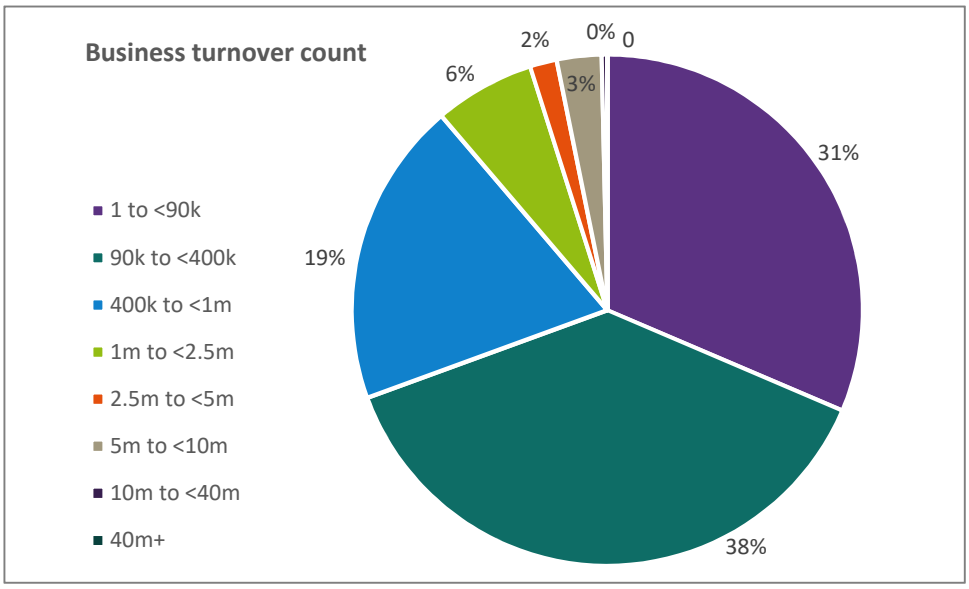
These travel to work flows are considered further in Section 2.5.3.4 to develop economic value estimates.

Turnover

The following **Figure 2-6**, presents the distribution of businesses in Study Area 1 by turnover levels. In this analysis, we have only incorporated local based businesses, and not local branches of bigger companies where the available turnover data is company-wide. As such there is further turnover that is not captured.

Of the businesses included here, 60-65% about the A487 via Newgale have turnover less than £400,000, though a significant share of businesses have turnover over £1million (15-20%).

Figure 2-6 Local turnover levels of businesses



Source: Experian 2016; Atkins. Sample 1,510 businesses.

By considering these turnover ranges and their business counts, we have been able to approximate the turnover associated with the study area about the A487 via Newgale. This is summarised in Table 2-17 below, for businesses with local turnover data. The vast majority of businesses in the Experian dataset had turnover ranges provided rather than actual turnover values. For example, a business that had a £1m to £2.5m turnover range provided has a minimum turnover of £1m, a maximum of 2.5m and a medium turnover point of £1.75m. As such, we present minimum, medium and high point turnover levels for the local area.

Table 2-17 Local business turnover levels

Area	Minimum turnover	Medium point turnover	High point turnover
Local area[17]	£556m	£1,011m	£1,465m

Source: Experian 2016; Atkins. The medium point reflects the half-way turnover of each turnover range.

To determine how many of these businesses, and to what extent employees and business turnover, depends on the A487 via Newgale, a business survey was undertaken, as detailed in the following sections and drawn out in Section 2.5.3.4.

2.5.3.3. How businesses value the existing road

Atkins developed a business and organisations survey[18] from which there were 72 responses and this was undertaken to gather insights on the engagement, use and value of the road for the business and organisations community. The Experian data was also used to identify participants for the survey, alongside the Council's business contact lists, and to ensure there was survey representativeness by locations, sectors and business sizes. The survey was advertised and accessible on the council's website and reminders were provided to businesses and business forums.

The survey covered:

Business information (location, type and number of staff);

A487 via Newgale use (for travelling to/ from customers, suppliers access, delivery of output and others) and regularity;

Alternative routes for these uses;

The proportion of staff who use the A487 via Newgale to travel to work;

How important road connectivity to different locations is for the operation of the business or organisation; and

How important characteristics of the local area are for the operation of the business or organisation.

Respondents were asked to enter a score from 1 to 5 where 1=not important and 5=very important.

Appendix C, Section 4.3, sets out the survey questionnaire and its responses in full.

The following key insights emerged from the survey:

The survey demonstrated **the importance of connectivity** for business operations, where access to each of St David's, Solva, Newgale and Haverfordwest was scored 4 out of 5 and over. Being easily accessible by road was rated at an

[17] This corresponds to Study Area 1 of the business analysis (the largest area covering St Bride's Bay, St David's Peninsula and Haverfordwest).
[18] 'Business and organisations survey: assessing the value of the A487 via Newgale'; Atkins & Pembrokeshire County Council; 2018

average of 4.7 out of 5 by respondents and was the most important local feature, with 90% of respondents scoring this at 5 out of 5.

The survey demonstrated **the importance of A487 via Newgale for business operations - 90% used the road at least weekly for a business purpose and 71% daily.**

However, **83% reported a lack of a good or suitable alternative route**, and 11% identified there being no suitable alternative for a business purpose. In combination, 80% stated a use that is at least weekly and which has a poor or no alternative route.

Around a quarter of employees in the survey area **use the A487 via Newgale to travel to work.**

Some **important community assets and organisations** also responded to the survey, as schools, health and social care providers, community groups and charities. All of these respondents had at least weekly use of the A487 via Newgale, whilst the majority had a daily use and specified a lack of good alternatives.

2.5.3.4. Economic value of business use

We have determined economic value estimates by using the Experian business dataset and its analysis, the survey responses, and the traffic modelling of the A487. This section draws together value estimates, which supplement the qualitative statements of sector road use summarised in Section 2.5.3.2.

Business turnover related to road use

We have totalled the business turnover associated with the survey responses, where 37 of the responding businesses could be directly matched to their turnover data in the Experian dataset and this came to a total of £44,400,000. Of the remainder of responses that could not be directly matched, we have used the average turnovers of local businesses by relevant sector from the Experian data to act as approximate turnover levels. As such, the local 2016 annual turnover of the survey respondents becomes £61,300,000.

To understand what level of turnover is related to the A487 via Newgale, we have undertaken the following disaggregation for the most critical of road use.

Table 2-18 Turnover disaggregation by road criticality of surveyed businesses

Turnover category	£value (nearest 100,000)	Share of total
1) Total local turnover – with sector averages added in	£61,300,000	100%
2) Local turnover for businesses that rated the importance of road access as 4 out of 5 or higher	£60,800,000	99%
3) Local turnover for businesses that rated the importance of road access as 4 out of 5 or higher and – used 'the road' daily	49,700,000	81%
4) Local turnover for businesses that rated the importance of road access as 4 out of 5 or higher; used the road daily and – stated there was no a good alternative road route	48,800,000	79%
5) Local turnover for businesses that rated the importance of road access as 4 out of 5 or higher; used the road daily and – stated there was no suitable alternative road route	7,500,000	12%

Source: Atkins. Business and Organisation Survey.

We have estimated the turnover that is dependent on the road ('critical road use'), by applying the share of turnover where the businesses use the road daily (for one or more purposes) and where there is either a) no good alternative or b) no suitable alternative. These relate to revenue categories 6 and 8 in Table 2-18 above.

We have applied these 'critical road use' turnover shares from the survey to extrapolate a figure for the total local turnover, as was presented above in Table 2-17 with the turnover ranges. As noted previously, only 45% of all businesses had local turnover data available and as such the figures in Table 2-19 are an underestimate.

Table 2-19 Local business turnover levels within the study area

Turnover category	Minimum turnover £	Medium point turnover £	High point turnover £
Total Local Turnover	£556m	£1,011m	£1,465m
Local Turnover of critical road use and no good alternative (category 4) at 79%	£442m	£803m	£1,165m
Local Turnover of critical road use and no suitable alternative (category 5) at 12%	£68m	£123m	£178m

Source: Experian 2017; Atkins. The medium point reflects the half-way turnover of each turnover range. 2017 prices.

With the set of assumptions noted through this section, we present an economic value of the road for businesses. This reflects critical road use with no suitable alternative (category 5). The turnover levels have been translated to GVA using the latest Annual Business Survey (ABS) data from ONS for Wales, which covers regional turnover and GVA ratios[19]. This direct economic value will capture business output and covers employment output and production.

Further, we have applied economic additionality to capture the indirect and induced impacts for a total economic value. Businesses create further output through their supply chain (indirect) and workers spend their salaries in the economy (induced) to stimulate further economic output and as such these reflect important impacts. Some of these outputs though are out of the Study Area (leakage) or are a result of displacement of activity in the area. These factors are considered alongside the economic multipliers as set out in Appendix C Section 1.2.

This economic value also reflects a conservative scenario where only turnover related to daily use with no suitable alternative was used. Businesses that have weekly use and/or only poor route alternatives may still have a turnover dependency on the A487 via Newgale, where without the road a portion of their turnover could be negatively impacted (i.e. with journey time impacts on costs and fewer customers travelling to the site). This value is also an underestimate where not all businesses in the local area had turnover data available and the available turnover was used as the basis for this calculation (i.e. 45% of businesses, as the first row of Table 2-19).

Table 2-20 Total economic value estimates for the A487 via Newgale

Total economic value estimates for the A487 via Newgale for business:
£26 million – £69 million a year
2017 prices

These values have been used to establish the disbenefits that arise from closure of the road in the Do Nothing scenario (Option 1) detailed within the economic case in Section 3.9 of this report.

2.5.3.4.1. Employees road use

As well as considering the economic value of the business road use (capturing employment), we also consider the number of employees that use the road to travel to work.

[19] 2017 ONS regional ABS data was used, with a last year of 2015. The turnover and GVA for Wales determined a turnover:GVA ratio of 3.00.

We have considered the shares of travel work flows presented in Table 2-16, which covered the main flows between St David's and Haverfordwest and thus likely to be using the A487 via Newgale, and applied these to the total employment[20]. The number of employees having to travel to work (TTW) are shown below:

Table 2-21 Travel to work flows for A487 via Newgale

Origin (MSOA)	Destination (MSOA)	Total employees (origin)	TTW share of total origin	TTW employees
Haverfordwest 005	St David's 003	7,000	7%	490
Haverfordwest 006	St David's 003	3,000	4%	120
St David's 003	Haverfordwest 005	2,250	18%	405
St David's 003	Haverfordwest 006	2,250	6%	135
Total		15,000		1,150

Source: DataShine Commute; NOMIS Bres 2016; Atkins

The total employees who are travelling to work on this route is estimated at 1,150. We have then considered the share of these for whom there is no alternative to the A487. This uses the outcome of the business survey[21] of 14%. This estimates **160 employees for whom the A487 via Newgale is critical and without suitable alternative, for their work journeys.**

2.5.3.5. Business use summary

The total economic value of £26 – £69 million total net GVA captures revenue generating activities and employment value. The A487 via Newgale provides access to product, customer, supplier and labour markets that are essential for business operations and provide key inputs for business turnover. The value of the road was well demonstrated here through the business and organisations survey[22].

These businesses will also be providing tax revenues to the government, where these can be estimated by applying the rate of corporation tax to a profit estimate of the total turnover. This reflects £0.7 – £1.7 million.

In addition, Table 2-15 presented an overview of the likely road use level for the key business sectors that emerged for the Study Area. Of the seven sectors that are largely revenue generating, three were rated at a medium operational use of 'the road' and three were rated high.

2.5.4. Visitors

This section is informed by socio-economic data of the local area, feeding in information from report section 2.1.1.1, Appendix C - Section 4.4, as well as insights of national and regional visitor surveys and local visitor data. Two key visitor studies have been used in understanding the nature and value of the visitor economy, these are the 2011/12 Pembrokeshire Visitor Survey and the Wales Coast Path Visitor Survey 2015[23]. It considers the value of the existing road to the local visitor economy by understanding these visitors, their visit experiences and value, and how the A487 via Newgale supports these.

[20] We have used the employment totals for St David's and Haverfordwest using NOMIS data from the Business Register and Employment Survey.
[21] Question 7 of the Business and organisations survey, as covered in Appendix C.
[22] 'Business and organisations survey: assessing the value of the A487 via Newgale'; Atkins & Pembrokeshire County Council; 2018
[23] Two parts of joint report by Beaufort Research Ltd and Cardiff Business School, for Natural Resources Wales. 'Wales Coast Path Visitor Survey 2015 & Economic Impact of Coastal Walking in Wales 2014'

2.5.4.1. Context of the A487 via Newgale for visitors

The area brings in many visitors, who may travel about the Pembrokeshire Coast National Park (PCNP) and engage with areas and visitor sites accessed from the A487 via Newgale. As set out on Section 2.1.3, the visitor economy (food and accommodation, arts and recreation and retail sectors) is crucial to the local economy, accounting for 38% of employment.

As identified in the Welsh Government's Economic Plan[24], tourism is one of the four foundation sectors and is recognised as being particularly important for the economy of rural areas. Tourism has a major economic role in Pembrokeshire, and the A487 is a strategic route in accessing tourism assets like the Pembrokeshire Coast path and the St David's Peninsula.

The proximity of the A487 to the coast supports visitor stop-offs in this area driving tourism and engagement with local activities, food and accommodation offerings.

Going forward, Haverfordwest is due to be developed with a major culture-led masterplan that includes an exhibition gallery, a County library, a market redevelopment on the Western Quayside, a riverside promenade and shopping centre, and a heritage centre for the town with a tourist information centre.

Milford Haven is a stop off for cruise ships, where international tourists typically get coaches trips to visit St David's. Milford Haven is the subject of planned regeneration by the Milford Haven Port Authority, with a focus on cultural narrative. The 'Milford Waterfront' development is also underway, to create leisure and retail space around its existing marina, which could unlock tourism opportunities and deliver new economic activity.[25] Fishguard Harbour and Pembroke Port connect to Ireland with twice daily passenger ferries.

The Welsh Strategy for Tourism 2013-2020 contains the ambition to grow tourism earnings in Wales by 10% or more by 2020. One of the actions to achieve this ambition is promoting improved transport links by air, sea, road and rail. Employment in the tourism-related accommodation and food services sector in the region is forecast to increase by around 50%, and GVA by over 40%, in the period 2012-2030[26].

2.5.4.2. How many visitors and where do they go

Local visitor numbers

Newgale attracts a significant level of visitors, despite its modest size. As this section demonstrates, this has been shown with coastal path user counts and the Pembrokeshire visitor survey. This is likely due to the area having many of the highest rated features by visitors in the Pembrokeshire survey. This helps demonstrate the value of the A487 via Newgale, in supporting these visitor movements.

The Pembrokeshire Coastal Path has a user counter in place to capture footfall. One counter is just north of Newgale on the way to Solva, and Table 2-22 shows for Newgale there is an average of 18,000 annual users. The data shows a drop from 2010 that has not fully recovered, however the path counts have increased again since 2015 coinciding with completion and publicity of the Wales Coast Path to over 18,000.

[24] Prosperity for All: Economic Action Plan, 2017, Welsh Government
[25] Milford Haven Port Authority - https://www.mhpa.co.uk/news/2017/03/09/port-of-milford-haven-showcases-business-and-regeneration-plans-at-national-assembly-for-wales/ (accessed 12/03/2018).

[26] Swansea City Bay City region: Economic Regeneration 2013-30; forecasts by Cambridge Economics.

Table 2-22 Coastal Path Annual User Counts

Year	Path counter - Newgale
2007	23,119
2008	21,523
2009	25,479
2010	16,839
2011	16,811
2012*	11,707
2013	no data.
2014	15,382
2015	11,733
2016	18,917
2017	18,863
Annual average	18,037

*Source: Pembrokeshire Coast National Park Authority. *2012 had some missing data for January and February.*

These figures are used in estimating economic values further below. However, it is recognised that such path counts are conservative measures of visitors to the local area, where some visitors will not interact with the coastal path.

Further, the traffic modelling presented in Section 3 of Appendix C demonstrates a clear peak season effect for July and August, at least in part reflecting the increase in visitors during summer. The peak season uplift (August) from the average month is 1.47, moving from 2,184 to 3,219 average daily traffic flows (AADT). These vehicles may not all stop or engage with the Study Area, however this is a significant increase in one-way movements of over 1,000 vehicles a day. If we take the July and August uplifts and assume what share are visitors to the Study Area (e.g. 50%) and an average car occupancy (e.g. 2-3 persons), a high-level indication could be of an additional 20,000 to 40,000 visitors to the Study Area in the peak season.

For the wider area, the UK's official National Park website presents figures for each national park annual visits and estimates 4.2 million visitors a year to Pembrokeshire county as a whole. This relates to 13 million visitor days, with 3.1 days on average per visit.[27] These county-wide visitor estimates are based on a model, and as such are indicative. A more in depth study of the visitor economic value should firstly determine disaggregated local visitor numbers.

Where do visitors go

Newgale

The Pembrokeshire Visitor Survey 2011/12 identified the locations that people visit. Table 2-23 below presents these shares and sets out how well connected (strong, medium or low) these locations are with Newgale:

[27] As reported by National Parks UK: these figures used STEAM reports. The Pembrokeshire estimates were for the whole county, not just the national park. http://www.nationalparks.gov.uk/students/whatisanationalpark/factsandfigures (accessed 28th February 2018)

Table 2-23 Visitor Locations and Newgale Connectivity

Location	Share of visitors	Newgale connectivity
St David's	38%	Strong – using A487, bus (20 minutes) and car (<15 minutes). Walk (2-3hr)
Tenby	36%	Low - other side of Pembrokeshire, car (50 minutes)
Haverfordwest	23%	Strong – A487, bus (25 minutes) and car (20 minutes)
Pembroke	21%	Low – car (40 minutes, via Haverfordwest and A487)
Fishguard	20%	Medium – car (25 minutes, using A487 for journey start and end)
Saundersfoot	19%	Low - other side of Pembrokeshire car (50 minutes)
Newgale	18%	n/a
Narberth	18%	Medium – car (30 minutes, via Haverfordwest and A487)
Newport	13%	Low – car (40 minutes, via Fishguard and A487)
Milford Haven	9%	Medium – car (30 minutes, via Haverfordwest and A487)
Pembroke Dock	8%	Low – car (40 minutes, via Haverfordwest and A487)
Dale	8%	Low – car (40 minutes, via Haverfordwest and A487)

Source: Pembrokeshire Visitor Survey 2011/12 (sample 1,861); Atkins judgement. Visits are taken to multiple locations so percentages do not sum to 100%.

A notable share (18%) of those surveyed visited Newgale (2011/12 latest data) for or during their trip (both day and overnight trips).

The top attraction in Newgale is its beach. The beach has Blue Flag and Seaside Award status and is also one of the longest in Wales and offers surfing and other water sports use and tuition. In Newgale, there are a few accommodation offers for visitors, including the Newgale Coast Holiday Park and Newgale Camping Site.

Newgale also offers entry to the PCNP and there are several well listed walks that can be accessed from Newgale and its coastal path entry points. The National Trust Southwood Estate which is being developed is also an increasingly attractive destination. Newgale also contains the Sands Café and the Duke of Edinburgh Inn along from surfing spots. There is also a country supplies shop, a surf shop, and a second café just south of Newgale: Pebbles café.

Wider area

Connectivity to the key visitor locations in Pembrokeshire is an important aspect of the value of the A487 via Newgale. Significantly, St David's and Haverfordwest are Pembrokeshire's 1st and 3rd most visited places according to the survey, and these are both in the local area as points on the road. If we consider the destination shares presented in Table 2-23 and the county wide modelled estimate of 4.2 million visitors, then Haverfordwest and St David's could together reflect up to 1.5million annual visitors. (These figures are based on modelling and a visitor survey, that may not reflect all visitor experiences, and so are indicative levels).

However, having these two significant destinations on 'the road' also enhances the offer at other area localities, for example Newgale. People may choose these smaller destinations as a base, or visit them from their base in Haverfordwest or St David's, as part of their trip.

Top visitor sites

The recognised top visitor sites in Pembrokeshire cover the natural environment and cultural assets Table 2-24 below sets out these top sites and notes whether they are present in the area studied or are accessed directly by the A487 via Newgale.

Table 2-24 Top visitor sites in Pembrokeshire

Top visitor sites	Local area and/ or accessed by 'the road'?
Cultural	
St David's Cathedral a central attraction of St David's as the smallest city in the UK	Yes
Pembroke Castle	Not directly
Carew Castle and Tidal Mill	Not directly
Manorbier village and Castle	Not directly
Natural environment	
PCNP With estimates of 4.2 million visitors a year (13 million visitor days) and £498 million visitor spend[28]	Yes
Tenby, seaside town with good access to cultural and family attractions	Not directly
Ramsey Island RSPB Reserve	Some road access - reached by boat trips from villages including Martin's Haven and St David's.
Skomer Island – as reached by boat trips.	Some road access - reached by boat trips
Stackpole nature reserve	Not directly
Other blue flag beaches	**Yes**, Newgale and Whitesands on 'the road'
Other attractions	
Oakwood Theme Park, Wales' biggest theme park With an estimated 400,000 - 500,000 visitors during its open season	Not directly
Manor House Wildlife Park	Not directly

Source: Atkins online research

Of these top sites, several are contained within the local area and/ or can be accessed by 'the road', namely – St David's Cathedral, the Pembrokeshire Coastal National Park, Ramsey and Skomer Islands (followed by a boat), and blue flag

[28] NationalParks.gov.uk - http://www.nationalparks.gov.uk/students/whatisanationalpark/factsandfigures (accessed 12th March 2018)

beaches. Although contained within the PCNP attraction, Solva Harbour is an attractive destination in its own right and mostly reliant on access from the A487. Solva has with good car parking, pubs/restaurants and shops and access to the Wales Coast Path from the A487.

2.5.4.3. Visitor types and trip length

Visitor profiles

The Pembrokeshire Visitor Survey of 2011-12[29] and the more recent Wales Coast Path Survey provides good insight into the area's visitor profiles. The following provides the key visitor insights:

- **Age profile** – there was a higher average age profile than the general population with a lower share under 25. The Wales Coast Path Survey[30] reported an average visitor age of 53 in Pembrokeshire;
- **Age and type** - 15% were younger independents (<45), 38% were families and 47% older independents (>45). This changes through the seasons, where families are the biggest group in during the summer months;
- **Socio-economic status** – 75% of visitors are in the ABC1 social class[31], compared to a UK average of approximately half the population. This proportion has been on the increase from previous survey waves;
- **Origin** - the home market remains key, where the visitor origin has been split almost 50:50 between those from Wales and those outside Wales (51% Wales, 44% UK and 5% overseas). The Wales Coast Path Survey origin data was well aligned where 52% of Pembrokeshire's visitors were Welsh residents, 46% from the UK and 3% beyond the UK;
- **Returning -** there was a strength of attachment to the region amongst its visitors, where a quarter visit more than once a month and 68% of all visitors reported they were very likely to return in the next 12 months and 81% in the next 5 years.

Further, the Wales Costal Path survey found:

- **Group size** - There were 164 user groups surveyed in Pembrokeshire, and of these there was an average of 1.9 adults and 1.6 children per group;
- **Coastal Path travel** - 93% walking, 6% cycling and 2% horse riding or motorised/assisted vehicle;
- **Path awareness** - those visiting Pembrokeshire also had the greatest awareness (61%) of the path's national unification and full coastal coverage. This likely reflects the central location of the Pembrokeshire path section, its link to the well visited PCNP and that people here were more likely to be moving onto other path sections before or after;
- **Path use** - 3.2 miles was the average Coastal Path trip length of those surveyed in Pembrokeshire, with 58% doubling back.

Length of stay

The Pembrokeshire Visitor Survey[32] provides good insight into the composition of visits that are day trips and those that are longer. The following provides the key insights:

- **Day and overnight visits** - day trips accounted for a quarter of all visits, with staying trips within Pembrokeshire accounting for nearly 70%. In 2011/12 Pembrokeshire attracted a higher proportion of visitors who were staying outside the county, up to 13%;
- **Staying visits** – these visitors stayed an average of 6.3 days. For 20% of these visitors, this was their 'main holiday' (with a higher share in summer, 40%), and for most the visit reflected a 'short break' (56%).

The importance of overnight and longer trips has implications for the value of the visitor economy, and the A487 via Newgale's contribution to this local value.

[29] 'Pembrokeshire Visitor Survey 2011-12'. This survey for June-July informed the Destination Management Plan. There were over 1,800 interviewees and 236 who followed up with a second interview phase. Visitors could either by staying or day visitors, day Visitors were not shopping or undertaking a routine appointment and must have spent three or more hours away from home, including travel.
[30] Wales Coast Path Visitor Survey 2015 & Economic Impact of Coastal Walking in Wales 2014; S. McDonough and N. Roche; for Beaufort Research Ltd. Natural Resources Wales Evidence Report No171.
[31] ABC1 class – Middle Class - groups together upper middle class, middle class and lower middle class.
[32] Pembrokeshire Visitor Survey 2011-12.

Destination of stay

Table 2-25 below demonstrates where the surveyed visitors stay in Pembrokeshire as well as how accessible these are to and from Newgale, similarly to Table 2-22 above.

Table 2-25 Where Visitors Stay in Pembrokeshire

Location	Share of visitors	Newgale connectivity
St David's	16%	Good
Tenby	17%	Low
Haverfordwest	6%	Good
Pembroke	5%	Low
Fishguard	5%	Medium
Saundersfoot	7%	Low
Newgale	4%	n/a
Narberth	9%	Medium
Newport	6%	Low
Milford Haven	3%	Medium
Pembroke Dock	1%	Low
Dale	3%	Low
Other	18%	-

Source: Pembrokeshire Visitor Survey 2011/12 (sample 1,861); Atkins. Some overnight visitors surveyed were staying outside of Pembrokeshire, i.e. Other at 18%.

A number of Pembrokeshire visitors come from outside the county, where they are staying, for day trips. Of those staying in Pembrokeshire, Tenby - not well connected to Newgale - and St David's - on the A487 via Newgale - are the most popular destinations to stay.

Newgale reflected 4% of the staying visitors who were surveyed, despite Newgale being a small village with few accommodation offerings. The incentives to stay may reflect a) the quality of the natural environment and beach at Newgale, as well as the access to the PCNP; and/or b) Newgale's road connectivity where it is conveniently accessed with the A487 from other major highways.

2.5.4.4. What visitors value

The Pembrokeshire Visitor Survey provides good insight into the area's visitor experiences. The following points provide key insights into visitor activities and their importance:

- For the main activity, 27% of visitors come to walk, 10% come to visit the beach and 8% to visit natural attractions. Ratings for country paths and the Pembrokeshire Coast Path were very high;
- Over 20% said a motivation for visiting was to visit the PCNP, 24% the beaches, 46% for the natural landscape and 33% for having a peaceful, quiet and relaxing time;
- Of the visitors to Pembrokeshire, the second interview stage revealed that for 8% the PCNP was the main reason to visit, and 51% as one of the reasons.

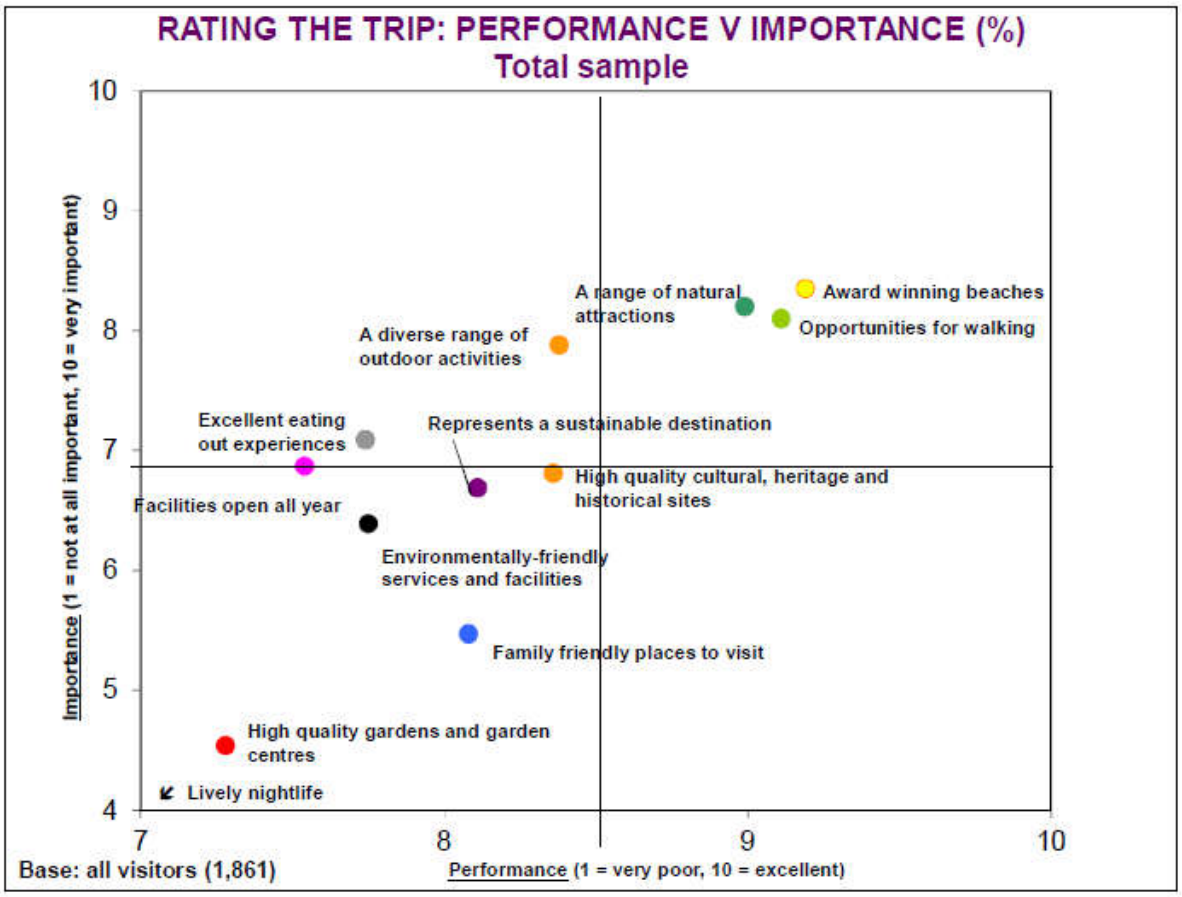
Access to the PCNP, beaches and coastal path is clearly a key attraction for visitors and a factor in their decision on where they stay. The A487 via Newgale provides access to a wide range of activities that have been shown to be important to visitors, with Haverfordwest, St David's and Newgale offering most of these between them.

The Pembrokeshire visitor survey also offers the following insights into what matters for visitors:

- When visitors rated activities and features for their importance and performance, all trip dimensions scored over 7/10 on performance, apart from lively nightlife (which was also low importance). All dimensions that were important, performed well.
- The most important dimensions were rated to be award winning beaches, a range of natural environment, and opportunities for walking (all over 8/10). These dimensions were also rated the best performers (9/10 or higher). Notably, these are dimensions that are strongly offered at Newgale, within the Study Area and are accessible from 'the road'.

These dimensions are shown in Figure 2-7 below with the survey's results showing dimension importance vs performance ranking. Note that this figure uses a 5-10 score scale, where all dimensions scored over 5/10.

Figure 2-7 Trip ratings : Performance v Importance



Source: Pembrokeshire Visitor Survey 2011-12, Figure 14b

The assignment of importance to the activities that are undertaken by visitors further demonstrates the A487 via Newgale's value to the visitor economy where it provides access to these visitor opportunities.

The following section 2.5.4.5 looks at visitor road use in more detail.

2.5.4.5. How the existing road supports this visitor value

As demonstrated in Section 2.5.4.2, movements within the local area and to other popular visitor destinations overwhelmingly utilise the A487 via Newgale, and in some places local public transport and walking.

Visitor surveys have shown that few people use public transport for or during their trip with car travel being the significant travel mode. Table 2-26 summarises the survey findings.

Table 2-26 Travel mode to and around Pembrokeshire for visitors

Mode	To Pembrokeshire	Around Pembrokeshire
Private Car or van	88%	88%
Motor home	3%	2%
Train	3%	0%
Plane	3%	0%
Private car/van towing a caravan	2%	0%
Private coach/ bus	2%	1%
Boat/ferry/yacht	2%	0%
Timetabled public service bus/ coach	1%	4%
Taxi	0%	0%
Hire car	0%	0%
Walk	0%	18%
Bicycle	0%	2%
Motorbike	0%	0%

Source: Pembrokeshire Visitor Survey 2011-12; Atkins. Some interviewees utilised two modes i.e. plane and hire care so percentages do not sum to 100%. Bolded modes reflect road use.

Notably, once in Pembrokeshire 20% are utilising active modes and modes which may utilise the Coastal Path and other public footpaths and open landscape in the area rather than the road network.

The road network is clearly significant to the visitor experience in accessing locations and activities during their trips to Pembrokeshire, whilst walking is also notable. The local area and the A487 via Newgale provide access to key visitor destinations and experiences, with opportunities to also utilise active modes.

2.5.4.6. Economic value of visitor use

For the purposes of estimating the economic value of the area's visitors, we provide an indicative estimate of visitor numbers related to the area studied about the A487 via Newgale. However, estimating the number of visitors to the specific area is difficult.

We focus here on visitors to Newgale, where these visitors have a greater dependency upon the A487 via Newgale and their trip is more likely focused within the area of concern. With a lack of visitor number information to the study area localities, we have used the number of visitors to the local Coastal Path section as a proxy. The 2017 level was 18,863 annual visitors to the area. As noted in 2.5.4.2, this is likely an underestimate of the total annual visitors to Newgale.

The following tables set out the calculations used for this scenario of the A487 via Newgale's visitor economic value.

Table 2-27 Visitor Economic Impact – Study Area – visitors

Table 2-27 shows the variables that were considered for valuing the economic impact and the variables shown numbered are selected for use in the calculations in Table 2-28.

Variable	Value	Source/ rationale
Total visitor numbers	18,863	Coastal Path at Newgale – from PCNP 2017
(1) Day trip visitors	6,036	Pembrokeshire Visitor Survey – 32%, including those who do not stay in Pembrokeshire
(2) Overnight trip visitors and stay in Pembrokeshire	12,830	Pembrokeshire Visitor Survey – 68% stay in Pembrokeshire
(n) Number of nights stayed for overnight trips	6.3	Pembrokeshire Visitor Survey 2011/12

Source: various, as noted. Atkins

Table 2-28 Visitor Economic Impact – Study Area – spend

Variable	Value	Source/ rationale
(a) Day trip spend per adult visitor	£4.20	Wales Coast Path Visitor Survey 2015, in 2017 prices (uplifted)
(b) Overnight trip spend per adult visitor	£34.50	Wales Coast Path Visitor Survey 2015, in 2017 prices
Day trip visitors' total spend	£25,000	(1 x a)
Adult overnight trip visitors' total spend	£2,792,000	(2 x b x n)
Direct total spend from visitors	**£2,817,000**	

Source: various, as noted. Atkins. Rounded to nearest £1,000.

To calculate the net economic value, we have applied additionality as set out in Appendix C Section 1.2. Leakage was set at 25% here, and a Wales Type 2 multiplier of 1.475 was applied.

Table 2-29 Visitor Economic Impact – Study Area – economic value

Variable	Value	Source/ rationale
Direct total spend from visitors	£2,817,000	As calculated in Table 2-28
Total net annual spend from visitors	£3,116,000	Applying additionality
Total net annual GVA from visitors	**£1,615,000**	Turnover: GVA ratio of 1.9from ONS ABS data
Total net jobs from visitors	90	Turnover: employment ratio of ONS ABS data from Food and Accommodation sector

Source: various, as noted. Atkins. Rounded to nearest £1,000.

We can expect this value to be most significant in the local food, accommodation and retail sectors. It is important to note that this estimate of the economic value of visitors to Newgale uses a proxy estimate for visitor numbers, at a small locality of the wider area about the A487 via Newgale.

The visitor economy value of the A487 link is broader than the visitors who get to Newgale, it is also about the interactions between areas and the appeal to visitors of having different destinations connected. A full economic valuation of the areas that interact with 'the road' would consider how Haverfordwest and St David's benefit from being linked to destinations in the area, and for other locations in between. However, this high-level estimate helps to assign an indicative economic value on a volume of visitors who engage with Pembrokeshire's tourism offer around the A487 via Newgale.

Not all of the visitor activity at St David's or Haverfordwest has a need for the A487 via Newgale and its current route. St David's' tourism value for example would be in some part derived/enhanced by the 'the road', but would its activity and added value is be less dependent on 'the road' than Newgale for example.

Further, it is important to note that this value can be considered in isolation, but there is some duplication with the economic valuation presented in Section 2.5.3.4 as this considers tourism related businesses and their economic value of the A487 via Newgale as well. **As such, these values should not be summed, but be considered in their own context as means to assess the existing road's value.**

The accommodation and food services sectors accounts for 11% of the business turnover in the area studies (Table 2-14). On this basis, out of the £26-69m of economic value (Table 2-20), we anticipate a value of £3-8m for this sector. We anticipate that a large part of this relates to tourism with income generated from visitors. Given that we have established that £1.6m of economic value exists in Newgale, and that other sites (such as Solva and St David's) are partly reliant on 'the road'; we anticipate that a value of £3m-£8m represents an estimate for the net GVA of the road value to the area's visitor economy. This figure is already included within the business turnover, so will not be applied as an addition.

2.5.4.7. Visitors summary

A more in-depth study of the visitor economic value should firstly determine disaggregated local visitor numbers. However, the surveys available did indicate some significant engagement with the local area. **A notable share of Pembrokeshire visitors engage with Newgale**, where according to the 2011/12 survey Newgale received 18% of visitors and a small share also stayed in Newgale (4%). Access to Newgale comprises both access from the existing road and with the Coastal Path, though surveys have shown road use remains the most significant mode for visitors both in arriving (88% by private vehicle) and travelling during (88% use private vehicle and 18% use walking) their trip.

Access to the PCNP and other walking trails, high quality beaches and the natural environment are the most important attractions for visitors to Pembrokeshire (scoring 9/10 or higher for their performance), and a factor in their decision on where they stay. **The A487 via Newgale provides access to these important attractions and activities that have been shown to be important to visitors**.

The existing road supports the visitor economy in the local area. The road facilitates movement between Haverfordwest (and the wider county) and St David's, which in turn supports the tourism associated businesses throughout the area. This is shown with a significant uplift in traffic during the peak season.

The existing road supports the visitor economy in the area, with an estimated value of £1.6million at Newgale and £3-8million more widely. Without the existing road connection, the visitor value of smaller localities, such as Newgale, could be undermined where it would no longer present itself as a suitable overnight destination, as visitors would be isolated from the other important local attractions. Visitors could still pass by via the Coastal Path, but passing trade by the road, and day trips to Newgale beach (especially from parties with children or people with mobility issues) would likely be reduced.

2.5.5. Economic value of the existing road – summary

Section 2.5.2 assessed the value of the A487 via Newgale to residents and found residents to have a high level of road use across different purposes.

Over 40% are using the existing road daily for work or access to education journeys. In addition, 85% of residents are also using the road regularly for social and leisure purposes; 70% for regular shopping and 62% for professional appointments. These reflect important activities to quality of life and economic and social wellbeing. The A487 via Newgale has a significant value to individuals within the area studied. The existing road provides access to the larger

centre of Haverfordwest for smaller communities, providing social connection, access to health and education and work and leisure opportunities.

Section 2.5.3 assessed the value of the existing road to businesses using Experian's latest business data and the study's '*Business and organisation survey – the value of the A487 via Newgale'*.

This analysis determined that there were over 3,000 businesses in the area studied, with an average of 7 employees, and a sector mix where accommodation, food, agriculture and retail sectors were particularly prominent. The survey, which was reflective of the area's business mix, revealed the high extent of road use and lack of good alternatives for different business operations.

- 90% of businesses and organisation respondents used the existing road at least weekly for a business purpose and 71% daily. However, 83% reported a lack of suitable alternative routes, with 11% identifying no suitable alternative for a business purpose;
- The importance of connectivity for business operations was emphasised, where access to St David's, Solva, Newgale and Haverfordwest was scored 4 out of 5 and over. Being easily accessible by road was rated at 4.7 out of 5 on average and was the most important local feature;
- Around a quarter of the employees determined by the survey used the A487 via Newgale road to travel to work;
- The total net economic value of 'the road' for business was estimated at **£26 – 69 million**;
- The number of employees for whom the existing road is critical and without suitable alternative, for their work journeys, was estimated at **160 employees in the Study Area**.

Section 2.5.4 assessed the value of the A487 via Newgale to the visitor economy and found a high share of visitors have long trips requiring overnight stays in Pembrokeshire and that visitors value key assets locations in the area studied. Surveys have indicated that a significant number of visitors either visit or stay in the Study Area, though this should be further clarified with more detailed study.

Visitors were overwhelmingly using the road network to both arrive at and travel around Pembrokeshire. St David's and Haverfordwest were the 1st and 3rd most popular destinations within Pembrokeshire, whilst award winning beaches, the natural environment and walking opportunities were scored the most important attractions for visitors. The existing road provides connectivity between these destinations and attractions, and therefore enhances the appeal of its other localities as places to stay or visit.

- The net GVA of indicative visitor spend at Newgale was estimated at £1.6 million.
- The net economic value from visitors using the A487 via Newgale in the study area has an estimated value of **£3 – 8m per year for accommodation and food services**, as a key aspect of the area's tourism sector. (See Appendix C, Table 33)

2.6. Ecosystems value of coastal adaptation at Newgale

This section on the ecosystems value is informed by the Newgale Adaptation Plan[33] and the Newgale Habitat Creation Assessment[34]. We present an introduction to ecosystems and their value; discuss the current and future ecological features; and undertake both qualitative and quantitative assessment of the adaptation's ecosystems value.

2.6.1. Introduction to ecosystems and their value

Ecosystems have different functions, which in term produce goods and services that contribute to wellbeing at the personal, community and/ or economic level, often termed 'ecosystem services'. These functions and their goods and services can be disaggregated into wellbeing impacts as[35]:

- Direct use – direct interaction with the resources such as natural produce i.e. timber use (consumptive), or education and recreation (non-consumptive);
- Indirect use – impacts derived from the ecosystem services, i.e. the absorption of pollutants, the purification of water, flood prevention; and
- Non-use – this relates to non-tangible benefits, where individuals do not interact specifically. The knowledge that these services exist and are being maintained for others and future generations, and in knowing they are there as an option, has a value. Studies have shown that there is still willingness to pay even where the ecosystem's goods and services aren't directly captured by certain groups.

Biodiversity has an intrinsic value itself and is a key aspect of ecosystems, where a high level of biodiversity can ensure that we are supplied with the ecosystem services that support our wellbeing. Biodiversity is typically understood as being the number, variety and variability of species and plants in an area.

We have therefore undertaken an outline assessment of what ecosystem services are likely to be affected with Newgale's adaptation, and how significant these impacts could be.

2.6.2. Current ecological features

Newgale beach (with Blue Flag recognition) is a 2 mile stretch of sand with a shingle ridge, which has been assessed as retreating at a rate of 0.25 - 0.5m per year. The beach faces strong weather and storms from the Atlantic. The water quality is assessed as excellent.

The Brandy Brook Valley is a low-lying area opening out to Newgale beach in the West, sloping down to the sea, and with undulating hills to the North and South. The Brandy Brook floodplain has semi-natural bog vegetation and is rarely/never grazed. The lowland marsh habitat that runs through the study area could potentially be designated as a SSSI in the future[36].

The study area sits within agricultural land with grassland for cattle and sheep and some arable and fodder crops, whilst there are scattered wooded landscapes about this area.

There are no current air quality management areas of relevance in the study area, whilst for biodiversity, there are a selection of statutory designated sites including:

- Pembrokeshire Bat Sites and Bosherston Lakes SAC – 25-30km away (as a European designated site);
- St David's SAC;
- Pembrokeshire Marine SAC;
- Ramsay and St David's Peninsula Coast SPA;
- St David's Peninsula Coast SSSI ecological designation.

[33] 'Newgale Adaptation Plan - Strategy Report'; Atkins (2017)
[34] I&BR001D01 Newgale Habitat Creation Study – Environmental Assessment; Royal Haskoning DHV (2017)
[35] 'The Economic, Social and Ecological Value of Ecosystem Services: A Literature Review'; Eftec, for Defra (2005).
[36] For this assessment, it is assumed that the assemblage of habitats are of SSSI quality and they have been valued as of High importance.

There are also a number of notable and legally protected species in the area, and for some of these there are specific records. These include many bird species, a few amphibian and reptile species, bats, many insect species, and other terrestrial mammals.

Overall, the landscape of the study area is made up of farmsteads, small settlements scattered around the valley and tourist facilities such as cafes, shops and camping grounds on the coast. The Wales Coast Path and other public rights of way criss-cross through the area offering recreational experiences.

2.6.3. Overview of Newgale Adaptation

2.6.3.1. Natural adaptation and 'the road'

The area and the current location of the coastal stretch of the A487 will adapt, where there is intent to allow natural development of the shingle bank at Newgale. The proposed new road will realign either further back from the active zone of coastal movement or follow a new route crossing the valley further inland. This would enable the shingle bank to retreat naturally. It is anticipated the Shingle will retreat 25-47m over 120 years, and as such there would be new habitat creation in this space as an alternative to coastal squeeze.

Allowing the coast to adapt naturally will result in changes to flooding in the valley and has the potential to develop new habitats. The Habitat Creation Assessment[37] sets out and assesses the likely habitat creation. These can be summarised as:

1. **Brandy Brook Valley habitat**
   There is scope for increasing areas of water-logging or areas of open water. Welsh priority habitats that would likely be created here are wet woodlands and saline lagoons[38].

2. **Wales Coastal Path**
   The path is important in encouraging locals and visitors to engage with Wales' environment and to encourage local health benefits. The new road development will incorporate a re-located path in lieu of the section that is likely to be damaged and thus avoid adverse impacts.

3. **Protected species**
   The change to the habitats was assessed to have little or no impact on several of the protected local species. However, there is a need to consider eels, present at Brandy Brook, and otters, where increases in wet woodland will likely result in an increase in otters in the Newgale area.

4. **Existing habitat**
   Potential impacts to existing habitat types were not deemed likely from the changing habitat creation.

The creation of important habitats has potential benefits by increasing the number of important and protected species – increased biodiversity - and with wider environmental impacts.

Wet woodlands and **saline lagoons** are the most likely habitats to be naturally created here, where these are both important habitats for the area and nationally. According to the Habitat Creation Study, there is an opportunity to develop up to 8.3ha of wet woodland (potentially increasing to 20ha through flooding over time) and some 5ha of saline lagoon.

2.6.3.2. Adaptation Plan

Further, Pembrokeshire County Council is working with the community and other stakeholders to take a more planned approach, using the need to reposition the road as a catalyst for the positive planning of change. This is demonstrated with the Newgale Adaptation Strategy Plan.

Local stakeholders identified that with the loss of the current road, there would be opportunities for the landscape, local character and Newgale's offerings to visitors and locals through the valley, beach, Coastal Path and Coastal National

[37] I&BR001D01 Newgale Habitat Creation Study – Environmental Assessment; Royal Haskoning DHV (2017)
[38] 'UK Post-2010 Biodiversity Framework' (2012) supports statutory lists of priority habitats in England, Scotland, Wales and Northern Ireland. Priority habitats for Wales are wet woodland, intertidal sand and mudflats, saline lagoons, costal and floodplain grazing marsh and coastal saltmarsh.

Park links. These features also provide opportunities and challenges regarding ecosystem services. The following are features that have been incorporated in the Plan, which align with aspects of ecosystem services:

- Creation of natural resource wetlands;
- Wetland water management;
- Provision of a wildlife centre;
- Enabled access across the valley and to the Wetland area, with pathways linking areas;
- Provision of board walks and bird hides in Wetlands area;
- Improved natural aesthetic and opportunities to enjoy the natural environment; and
- Maintained connections to the beach and sea, and Wales Coastal Path.

The related ecosystem services provide value beyond the study area, for the region and at the national level; for those who visit and those who never do.

2.6.3.3. The value of habitat mosaics

A key feature of the Newgale Adaptation Plan is its mosaic of habitats and transitional nature. The area's biodiversity will interact across different land areas and will change over time with climate impacts. The mosaic of transitional habitats within the valley will help the area meet Pembrokeshire's requirement[39] for compensatory habitats (11ha) and will provide and protect varied habitats for different plants and species. The mosaic and transitional elements of the Newgale adaptation have been noted both as an aesthetic cultural service and a service for sustaining biodiversity.

2.6.4. Qualitative valuation

Wet woodlands bring ecological benefits with alder, birch and willow trees as the dominant species; and ash, oak, pine and beech trees as other species of tree. These benefits include supporting different flora and fauna, helping to increase protected and rare invertebrates and by providing cover and breeding area for otters. The potential creation of a saline lagoon could compensate the loss of similar habitats elsewhere in Pembrokeshire, and provide environmental regulation and biodiversity supporting services.

We have considered the potential impacts on ecosystem services from the Adaptation Plan, the new road land use and landscape (surrounding woodland and hedgerows) and the seafront landscape. Where necessary we consider the different locations of the proposed options. The assessment uses the ecosystem categories and aspects provided by Defra guidance (and the UN Millennium Ecosystems Assessment framework) to determine potential ecosystem services impacts.

Full detail on the qualitative analysis is shown in Appendix D. Overall, the adaptation is judged to have a **minor beneficial impact on ecosystem services**. The Adaptation Plan is crucial to help mitigate against adverse environmental impacts of the new road developments. Overall, it will be important to carefully consider the different features of the Adaptation Plan and their impacts on enhancing or protecting ecosystem services, and in the mitigation of any adverse impacts.

2.6.5. Quantitative valuation

2.6.5.1. Case studies

To provide a value on these beneficial ecosystem impacts, notably the protection and enhancement of biodiversity and accessibility of the area, we have considered the relevant literature, which is detailed in Appendix D.

2.6.5.2. Estimation for Newgale adaptation

Many of the case studies cover the value across a wide set of ecosystem services, and as such we consider parameters for Newgale adaptation that are of a similar habitat and where there is a relevant ecosystem service and/or a biodiversity value. We have also selected more recent studies and present the calculations and estimates in 2016 prices.

1) The Natural England study that considered Culm Grasslands by the coast of Cornwall and Dorset. The estimate calculation steps are outline below:

[39] Requirements are set out in the Shoreline Management Plan (SMP)

- The study provided a value per household per year of £19, and per visit of £14 for cultural, landscape and biodiversity services;
- Applying this to the 12,600 study area households[40] and the 18,000 average annual visitors[41] the Newgale adaptation estimates an **ecosystems value of £490,000 per year.**

2) Eftec's (2010) economic values report covering saltmarsh habitats. The estimate calculation steps are outline below:

- A value of £1,600 per hectare per year (which diminishes to £1,000 for hectare over 30) for the water quality improvement, recreation and biodiversity services.
- Applying this to the approximate 35 hectare area of the Newgale adaptation from valley to shoreline estimates an **ecosystems value of £60,000 per year**.

3) The Coastal and marine ecosystem services valuation case study for saltmarsh habitat. The estimate calculation steps are outline below:

- A value of £863 per hectare per annum for the amenity and recreational services of saltmarshes
- Applying this to the approximate 35 hectare area of the Newgale adaptation from valley to shoreline estimates an **ecosystems value of £30,000 per year**.

These estimates show a large variability, as is the nature for the developing ecosystems valuation literature, whilst the case studies are not a perfect alignment to Newgale's wet woodland, saline lagoon and marshland habitat creation. These estimates are indicative and show a range.

2.6.5.3. Conclusions

Overall, we can judge the Newgale adaptation (through a new road and Adaptation Plan) to provide **a minor beneficial impact**. The beneficial impacts are most notable with regards to cultural services – cultural heritage, recreation and tourism, social relations, education and aesthetic value. These are mostly direct uses whereby the attraction of visitors supports the local economy and the access to enhanced natural environment brings community and personal wellbeing and educational impacts.

The adaptation is also relevant with regards to regulating services, where the natural environment can mitigate the adverse road impacts on water and air quality. The Adaptation Plan brings particular value with the ecosystem services related to wetland water management and wetland and woodland regulation of air and water quality - without these aspects there would likely be a significant decline in the element quality, and flood risk could worsen.

In assigning an indicative value estimate to these services, we considered some best practice case studies and apportioned their value to the study area. As such, **we estimate a range of £30,000 to £490,000 per year for the ecosystem services of the Newgale adaptation**. However, it is important this is caveated as an indicative level, where the case studies themselves demonstrated a high variability in ecosystem valuations. With two of the estimates being at the lower end of the range, it may be more appropriate to be conservative for Newgale's ecosystems value.

Overall, it will be important to carefully consider the different features of the Adaptation Plan and their impacts on enhancing or protecting ecosystem services, and in the mitigation of adverse impacts.

2.7. Business needs

Given the present situation, with closures to the existing A487 during storm events and the associated costs for keeping the road open and growing threat of future road closure within the next 20 years, there is a need to provide an alternative route for the A487 or to provide a suitable solution for a coastal defence that works within the context of coastal change.

It is evident that the regional economy relies on the A487 to sustain businesses and provide livelihoods for the regional population.

The solutions to the above problem will need to consider:

[40] Census 2011 household figures for the Study Area MSOAs
[41] According to the Welsh Coast Path user counts and used in the 'Base Case Economic Value of the Road' report by Atkins.

- Suitable coastal defences for the long term, that works within the context of coastal change,
- Alternative routes for the A487 in the absence of suitable coastal defences that will provide safety improvements and transport efficiencies in terms of cost and time savings.
- The maintenance of the route of the A487 to the benefit of the range of users who use the A487
- To preserve the iconic view of Newgale
- Provide the adaptions that are needed to preserve the way of life of Newgale and other settlements in the area.

2.8. Potential business scope and key service requirements

This section describes the potential business scope and key service requirements for the project in relation to the above business needs. The business scope and service requirements identified within the following table provides the ranges within which options are considered in the economic case. The proposed initiatives identified and short-listed within this document will seek to address all of these requirements.

Table 2-30 Potential business scope of key service requirements

Service Requirements	Business Scope
Core (minimum)	• Maintain the Newgale beach and existing A487 as it currently is; • Continue to maintain coastal defences and clearing the road after storms; • Continue maintaining the Brandy Brook outlet through the shingle to prevent flooding.
Desirable (Intermediate)	• Provide a form of coastal defences, with limited construction at Newgale, to protect the existing A487 road; • Maintain the existing village of Newgale with as little effect as possible.
Optional (Maximum)	• Complete significant construction to either provide comprehensive flood defences to protect the existing road, or provide a new road while allowing the coast to evolve naturally; • Provide coastal adaptations to allow the village of Newgale to retain the vitality of Newgale.

2.9. Main benefits criteria

This section describes the main outcomes and benefits associated with the implementation of the potential scope in relation to business needs. Achievable measures and targets have been drawn from the WelTAG Stage 1 assessment.

2.9.1. Measures and targets

The Investment Objectives, and the measures and targets used to measure the benefits are included in the following table.

Table 2-31 Measures and targets for investment objectives

Investment Objectives	Measures	Targets
IO 1 - To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	• Number of times the A487 is closed • Number of incomplete journeys between St David's Peninsula and Haverfordwest • Travel time between St David's Peninsula and Haverfordwest • Allow the natural development of the coast	• 100% reduction in road closures by 2025 • Zero incomplete journeys between St David's Peninsula and Haverfordwest by 2025 • A 15% reduction in travel time between St David's Peninsula and Haverfordwest by 2025 • No active intervention to the coast required for the lifetime of the scheme
IO2 - To provide the optimal solution in terms of impact to the Pembrokeshire Coast National Park.	• Protection of existing habitats • Creation of new habitats • The contribution of transport on the local network to greenhouse gas emissions • The contribution of transport on the local network to air pollution and other harmful emissions • Noise levels • Impacts of new infrastructure on biodiversity and earth heritage features • Impact on heritage resources	• New habitats partly available by 2024 and fully available by 2039 • Minimise the additional green-house gases to 10% above the existing levels by 2025. • Minimise the additional exhaust emissions to 10% above the existing levels by 2025 • Decreases of noise receptors outweigh increases by a factor of 2 by 2025. • Construction on less than 10 hectares of habitats (excluding those of negligible ecological value e.g. improved grassland) • Construct on 0% of SAC/SSSI • Construct on 0% of ancient woodland • Zero physical impacts to heritage assets • Not nearer than 0.5km within Scheduled Ancient Monuments
IO3 - To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	• Accident frequency • Accident severity • Access to walking, cycling or public transport • Access to healthcare, education, training, life-long learning, shopping and leisure facilities. • Retains the integrity and character of the village and the range of current facilities	• Achieve a reduction in the number of personal injury accidents by 2025 • Introduce new walking and cycling routes by 2025 • Zero effect on the frequency of Public Transport by 2025 • Future planning policy allows relocation of property or businesses within the locality
Investment Objectives	**Measures**	**Targets**
IO4 - To protect the fabric, community, iconic nature and visual aspect of Newgale, while allowing the natural evolution of the coastline.	• Provision of parking • Numbers of private properties demolished • Land in use by the Community • Impacts of development land • Maintain connections across the valley	• No reduction in the number of parking spaces at Newgale beach or village by 2025 • Maximum 3 properties to be demolished by 2025

	• Scenic views • Status as a tourist destination • Reduce the need for maintaining coastal defences	• Reduce the loss of Best and Most Versatile (BMV) land to 5 hectares by 2020. • Provide one site for potential future development. • A network of access is created between the beach and village and across the valley from north to south. • Create viewpoints which allow the iconic view of Newgale to be achieved. • No active intervention of the coast after 2025
IO5 - To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.	• Public access • Capacity to reach key services • Numbers of National Park users • Numbers of visitors to Newgale • Value of the Local economy • Value of the wider (St David's Peninsula) economy • Users of the Wales Coastal Path	• Introduce new walking and cycling routes by 2025 • Zero effect on the frequency of Public Transport by 2025 • Maintain the current number of visitors at Newgale beyond 2025 • Maintain the current number of users of the Pembrokeshire Coastal Path beyond 202 • Increase the value of the local economy by 5% by 2025 • Increase the value of the wider St David's Peninsula economy by 5% by 2025 • Increase the number of users of the Pembrokeshire Coast Path by 5% by 2025

2.9.2. Main benefits criteria

Satisfying the potential scope for this investment will deliver the following high-level strategic and operational benefits, including potential improvements over the exiting situation. The Investment Objectives, and the potential benefits to different stakeholder groups, are included in the following table.

Table 2-32 Main benefits criteria by stakeholder group

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
IO 1 - To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	**National Park Authority**	**Quantifiable Benefits** • Improved access to walking, cycling or public transport • Reductions in travel time to National Park sites • An increase in the capacity to reach the National Park site destinations
		Non-Quantifiable Benefits • Increased social inclusion through additional accessibility to the National Park • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting enjoyment of the National Park
	Environmental Partners **(inc. National Resources Wales)**	**Quantifiable Benefits** • Improved access to walking, cycling or public transport
		Non-Quantifiable Benefits • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting enjoyment of the coast
	Local Authority	**Quantifiable Benefits** • No detriment of access to public transport • Reductions in travel time to Council services • Increases in the use of active travel modes, meeting the Public Health agenda • Removal of the cost of maintaining the coastal defences and protecting the existing road
		Non-Quantifiable Benefits • Improves the efficient, reliable and sustainable movement of vehicles along Local Authority highways • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities • Increased social inclusion through additional accessibility

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
	Road Users	**Quantifiable Benefits** • Travel time savings • Reductions in vehicle operating costs • Improved access to walking, cycling or public transport • Reductions in travel time to hospital and key services • Maintains the capacity to reach key services through private and public transport
		Non-Quantifiable Benefits • Improves the efficient, reliable and sustainable movement of people • Improves the efficient, reliable and sustainable movement of vehicles • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities • Increased freedom of movement – the capacity to travel in any given direction without obstruction by a transport route
	Wider Community (inc. National Trust)	**Quantifiable Benefits** • Travel time savings • Improved access to walking, cycling or public transport • Reductions in travel time to key services • Increases in the use of active travel modes • Maintains the capacity to reach key services through private and public transport
		Non-Quantifiable Benefits • Improves the efficient, reliable and sustainable movement of people • Improves the efficient, reliable and sustainable movement of vehicles • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities • Increased social inclusion through additional accessibility • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles • Increased freedom of movement – the capacity to travel in any given direction without obstruction by a transport route

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
IO2 - To provide the optimal solution in terms of impact to the Pembrokeshire Coast National Park.	**National Park Authority**	**Quantifiable Benefits** • Provides a benefit to people through reduction in noise levels within the National Park • Minimises the increase of the contribution of transport on the local network to greenhouse gas emissions within the National Park • Minimises the increase of the contribution of transport on the local network to air pollution and other harmful emissions within the National Park
		Non-Quantifiable Benefits • Improves the impact of traffic on the local environment and National Park infrastructure • Minimises impacts on the water environment within the National Park • Increased enjoyment and recreation within the natural environment • Minimises the impact of new infrastructure on landscape/townscape • Minimises the long term effects on landscape and townscape
	Environmental Partners **(inc. National Resources Wales)**	**Quantifiable Benefits** • Provides a benefit to people through reduction in noise levels • Minimises the increase of the contribution of transport on the local network to greenhouse gas emissions • Minimises the increase of the contribution of transport on the local network to air pollution and other harmful emissions • Minimises construction on habitats with ecological value • Avoids construction on designated SACs/SSSIs or Ancient Woodland
		Non-Quantifiable Benefits • Minimises the potential impacts of new infrastructure on biodiversity and earth heritage features • Avoids or minimises impacts on heritage resources • Avoids or minimises impacts on the water environment • Improved understanding and knowledge of marine wildlife • Promotes conservation aims and objectives

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
	Local Authority	**Quantifiable Benefits** • Improves the impact of traffic on the local environment
		Non-Quantifiable Benefits • Minimises the long terms effects on landscape and townscape
	Wider Community (inc. National Trust)	**Quantifiable Benefits** • Provides a benefit to people through reduction in noise levels • Minimises the increase of the contribution of transport on the local network to greenhouse gas emissions • Minimises the increase of the contribution of transport on the local network to air pollution and other harmful emissions
		Non-Quantifiable Benefits • Improve the impact of traffic on the local environment • Minimises the impact of new infrastructure on landscape/townscape

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
IO3 - To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	**National Park Authority**	**Quantifiable Benefits** • Increases the number of users of the Pembrokeshire Coast Path
		Non-Quantifiable Benefits • Improved access to the National Park • Minimises the impact of new infrastructure on landscape/townscape • Minimises the long terms effects on landscape and townscape • Future planning policy allows relocation of businesses within the National Park • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting enjoyment of the National Park
	Environmental Partners **(inc. National Resources Wales)**	**Quantifiable Benefits** • Increases in the number of non-motorised modes of transport and thereby reducing exhaust emissions • Creates economic value through provision of ecosystems services
		Non-Quantifiable Benefits • Minimises the impact of new infrastructure on landscape/townscape • Minimises the long term effects on landscape and townscape • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting enjoyment of the coast
	Local Authority	**Quantifiable Benefits** • Reduces the number of personal injury accidents on the road network within the National Park • Reduces the number of road traffic accidents blocking access to the wider St David's Peninsula • Reduces the number of road closures • Travel time savings

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
		Non-Quantifiable Benefits • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles in line with the Public Health agenda • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities
	Road Users	**Quantifiable Benefits** • Reduced number of personal injury accidents on the road network • Reduced number of severe personal injury accidents on the road network • Travel time savings • Reductions in vehicle operating costs • Improved reliability of access
		Non-Quantifiable Benefits • Improves the perceived safety of travel • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities • Increased freedom of movement – the capacity to travel in any given direction without obstruction by any planned new transport route
	Wider Community (inc. National Trust)	**Quantifiable Benefits** • Reduced number of personal injury accidents • Reduced number of severe personal injury accidents • Travel time savings • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting enjoyment of the wider St David's Peninsula
		Non-Quantifiable Benefits • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles • Increased freedom of movement – the capacity to travel in any given direction without obstruction by a transport route

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
IO4 - To protect the fabric, community, iconic nature and visual aspect of Newgale, while allowing the natural evolution of the coastline.	**National Park Authority**	**Quantifiable Benefits** • Maintains the number of car parking spaces • Reduced spending on car park maintenance even in the context of coastal change • Creation of new viewpoints for the iconic view of Newgale
		Non-Quantifiable Benefits • Improves the efficient, reliable and sustainable movement of people • Improves the efficient, reliable and sustainable movement of vehicles • Social inclusion is enhanced by increased accessibility • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities
	Environmental Partners **(inc. National Resources Wales)**	**Non-Quantifiable Benefits** • Minimises the impact of new infrastructure on landscape/townscape • Minimises the long term effects on landscape and townscape • Improved bathing water quality • Retention of Blue Flag and Seaside Award status
	Local Authority	**Non-Quantifiable Benefits** • Improved access to walking, cycling or public transport will promote the Public Health agenda • Social inclusion is enhanced by increased accessibility • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities • Reduces the long term need to maintain the coastal defences
	Road Users	**Non-Quantifiable Benefits** • Social inclusion is enhanced by increased accessibility • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities
	Wider Community **(inc. National Trust)**	**Quantifiable Benefits** • Minimises the loss of land used by the community • Minimises the effects on development land or creates new development land • Non-car users have improved access to walking, cycling or public transport
		Non-Quantifiable Benefits • Social inclusion is enhanced by increased accessibility • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities

Investment Objective	Stakeholder Group	Main Benefits Criteria by Stakeholder Group
IO5 - To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's eninsula	**National Park Authority**	**Quantifiable Benefits** • Travel time savings means it is quicker to reach the various National Park destinations within the St David's Peninsula • Travel time savings means that the destination is increasingly attractive as a destination and that people will spend longer in the National Park
		Non-Quantifiable Benefits • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting enjoyment of the National Park • An increase in the capacity to reach National Park site destinations
	Environmental Partners **(inc. National Resources Wales)**	**Quantifiable Benefits** • Creates economic value through provision of ecosystems services
		Non-Quantifiable Benefits • Minimises the impact of new infrastructure on landscape/townscape • Minimises the long-term effects on landscape and townscape • Improves the ability of people to use non-motorised modes of transport thereby reducing environmental damage
	Local Authority	**Quantifiable Benefits** • Improved travel to work times provides a potential for sustainable increases in population within the St David's Peninsula
		Non-Quantifiable Benefits • Improved access to education, training and employment between the St David's Peninsula and Haverfordwest • Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting the Public Health agenda
	Road Users	**Quantifiable Benefits** • Improved travel to work times • improved access to education, training and employment between the St David's Peninsula and Haverfordwest
		Non-Quantifiable Benefits • Increases freedom of movement – the capacity to travel in any given direction without obstruction by a transport route • Improved access to tourist, shopping and leisure facilities • Improves access to employment
	Wider Community **(inc. National Trust)**	**Quantifiable Benefits** • Improved travel to work and leisure times
		Non-Quantifiable Benefits • Improved access to education, training and employment between the St David's Peninsula and Haverfordwest • Non-car users have improved access to walking, cycling or public transport • Improved access to tourist, shopping and leisure facilities • Improved access to employment

2.10. Main risks

This section takes on an early view of the key risks that could impact on the successful delivery of the project and sets out what actions can be taken to ensure risk is minimised and managed.

Main Risk	Counter Measures
Business and Political Risks	
1. Availability of Capital funding, both in terms of Capital allocation from WG and funding by PCC Council	In addition to the WG provision of funding, need to ensure that other routes of funding are realistic: • Existing recurrent and capital budgets; • Prudential and institutional borrowing (where possible and appropriate); • Use of third party funding streams • Potential submissions to Welsh Government funding streams.
2. Acceptability of selected scheme by WG, PCNPA and stakeholders.	Consultation and regular communication to address concerns
3. Lack of public acceptance of the need for coastal adaptation prevents development of a scheme.	Continue public engagement, involvement and share knowledge of the effects of climate change.
4. An unsatisfactory consultation process and postponement/curtailment	Develop communication strategy to lead public opinion throughout public consultation process.
Service Risks	
5. Legislative changes.	Plan flexibility into the options where possible.
6. WG policy changes	Plan flexibility into the options where possible.
External Funder Risks	
7. A change in political climate at WG level.	Ensure that all requests are in line with existing WG policy.
8. Delay in WG approval of Business Cases delays delivery of proposals.	Submit Business Cases as early as possible to ensure timely approval of the plan.
Environmental Risks	
9. That the existing A487 is lost to erosion before a replacement is built.	Progression of project to design and construct the scheme.
Technical risks	
10. Investigations undertaken reveal unfavourable ground conditions, contaminated land or ecological, archaeological constraints.	Undertake early investigations to establish feasibility of selected routes.

2.11. Constraints

The project is subject to the following constraints:

- Constraints associated with working within the National Park and the limitations of planning policy on new developments affected by coastal retreat;
- Constraints in terms of tie in points within the road network which limit connections to the A487 north and south of Newgale;
- Current funding mechanisms;
- Availability of funding;
- Stakeholder involvement;
- Planning, consents and licencing requirements;
- Future environmental legislation.

2.12. Dependencies

The dependencies for the project are:

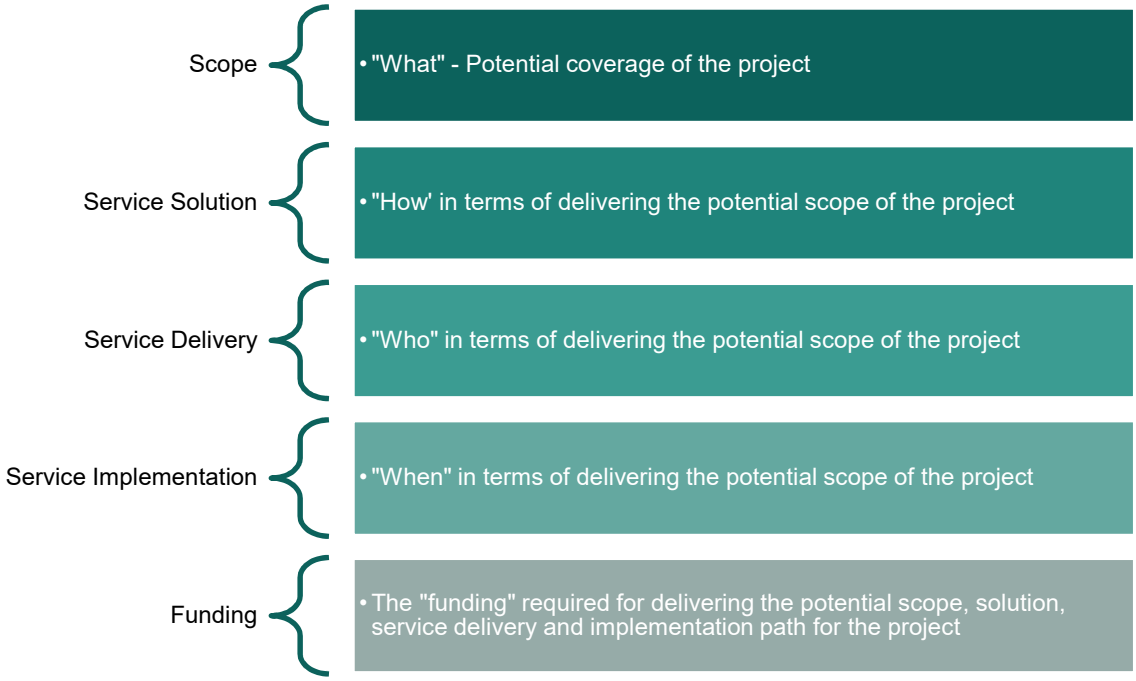
- The willingness of WG to change the funding mechanism to allow grant to be paid towards the scheme;
- Availability of funding from PCC for their share of the project.
- National Park policy
- Technical aspects -
  - Ability to make adjustments to the existing alignment options to provide the necessary engineering solution;
  - More detailed feasibility work to inform the engineering design e.g. ground investigations, junction arrangements and mitigations to reduce light pollution;
  - Explore varying levels of aesthetic quality for each of the options;
  - Produce a more mature engineering design to provide more accurate costings and enable the preparation of representative photomontages of the scheme;
  - Carry out walkover ecological and archaeological surveys along the proposed route corridors;
  - Identification of potential environmental mitigation and enhancement measures;
  - Re-assess the merits of the options taking account of themes emerging from the Adaption Plan.

3. The Economic Case

3.1. Introduction

In accordance with the requirements of HM Treasury's Green Book (A Guide to Investment Appraisal in the Public Sector) and the Welsh Government's standard for Better Business Cases, this section of the SOC/OBC documents the wide range of options that have been considered in response to the potential scope identified within the strategic case.

Within this Economic Case, the 'Options Framework Filter' has been used to select the preferred scheme, which uses the following stages of appraisal:



3.2. Critical success factors

The following Critical Success Factors will be used alongside the Investment Objectives to evaluate the long-list of options.

Table 3-1 Critical success factors

Ref.	Critical Success Factor	Measurement Criteria for the Scheme
CSF1	Business needs	- The option must satisfy all the Investment Objectives and associated business needs determined for the initiative. - The option must also comply with these objectives throughout project implementation. - The option must be the best fit with the demands for skills of the business and commercial communities within the area. - The option must satisfy the existing and future needs of the organisation.
CSF2	Strategic fit	- The option must provide a holistic fit and synergy with all key elements of national, regional and local strategies. - The option must complement the strategies of key stakeholders, such as Pembrokeshire Coast National Park Authority. - The option must be the best fit with the strategies of the business and commercial communities within the area.

Ref.	Critical Success Factor	Measurement Criteria for the Scheme
		- The option must fit with the Community Strategies for the area.
CSF3	Benefits optimisation	- The option must optimise the potential return on expenditure – business outcomes and benefits (qualitative and quantitative, direct and indirect to the organisation) – and assist in improving overall VFM (economy, efficiency and effectiveness). - The option must minimise associated risks.
CSF4	Potential achievability	- The organisation's ability to innovate, adapt, introduce, support and manage the required level of change, including the management of associated risks and the need for supporting skills (capacity and capability). - The option needs to be accepted by key stakeholders and local politicians. - There must be the management capacity, skills and vision to deliver the necessary change, or the awareness of the need to recruit assistance. - Innovative governance and management arrangements need to be deployed. - Effective and efficient collaborative working for the longer term.
CSF5	Supply side capacity and capability	- The ability of the market place and potential suppliers to deliver the required services and deliverables. - Sufficient established and reputable construction firms bid for work to ensure both competition and value for money in new building delivery.
CSF6	Potential affordability	- The organisation's ability to fund the required level of expenditure – namely, the capital and revenue consequences associated with the proposed investment. - The financial and non-financial benefits must more than repay the investment.

3.3. Scope Appraisal

3.3.1. Scope options

The following choices for potential coverage of the project is considered for the scope as follows:

- Do Minimum – Maintain the Newgale beach and existing A487 road as it currently is without interference to the village.
- Intermediate – Provide a form of coastal defences, with limited construction at Newgale, to protect the existing A487 road.
- Maximum – Complete significant construction to either provide comprehensive flood defences to protect the existing road, or provide a new road while allowing the coast to evolve naturally.

3.3.2. Advantages and Disadvantages

Table 3-2 Scope appraisal - advantages and disadvantages

Do Minimum	
Advantages	Disadvantages
• Retains the 'iconic' village and beach of Newgale • Does not require significant capital funding • Does not result in Pembrokeshire County Council having to pursue new funding arrangements for integrated coastal/highway projects. • Would appease Newgale business owners in the short-term.	• Is not sustainable – the coastline is evolving naturally and the road will be un-usable within 20 years (maximum) • Coastal erosion will mean that the greater St David's Peninsula will be connected by longer or sub-standard routes from Haverfordwest and the highway network, causing social and economic disadvantages to communities to the west of Newgale. • Ad hoc revenue and capital spend on 'clean up' in Newgale are not budgeted or, nor are they sustainable in an environment of ever reducing local government finance.
Intermediate	
Advantages	Disadvantages
• Lower capital expenditure would improve the current position (e.g. minimise flooding, road 'clean up' and road closures). • Less ad hoc expenditure in Newgale (due to less 'clean up'). • Many stakeholders would welcome a solution that minimises the impact on the 'iconic' nature of Newgale.	• Solution has a limited lifecycle and would only delay the natural evolution of the coastline. • Further investment would be needed in the medium term (20 – 30 years). • Any capital expended would only be stop-gap and therefore not value for money. • Even a reduced level of capital expenditure would still require a significant spend to import and install the amount of materials required. • Does not protect against the effects of fluvial flooding.
Maximum	
Advantages	Disadvantages
• Ensures that communities on The St David's Peninsula remain connected to Haverfordwest and the wider Pembrokeshire area. • Allows the natural evolution of the Newgale coastline. • Provides opportunity to retain the 'iconic' Newgale view from the roadside. • Optimise the socio-economic benefits to Newgale and the St David's Peninsula. • The feasibility work completed shows that significant work is required at Newgale and the expert advice recommends a maximum scope.	• Is capital intensive. • Funding steams are not currently well established, as this is a unique position, involving coastal and highway issues. • There may be some stakeholder and political opposition.

3.3.3. Conclusion

The table below summarises the assessment of each scoping option against the investment objectives and the Critical Success Factors.

Table 3-3 Scope appraisal - conclusion

Reference to:	Do Minimum	Intermediate Scope	Maximum Scope
Investment objectives			
1. To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	✗	✗	✓
2. To minimise the impact and adverse effects, caused by traffic and associated infrastructure, on the natural environment, beauty, wildlife and cultural heritage of the Pembrokeshire Coast National Park.	✓	✓	✓
3. To maintain an attractive, safe and well- connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	✗	✗	✓
4. To protect the fabric, community and iconic nature of Newgale, while allowing the natural evolution of the coastline.	✗	✗	✓
5. To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.	✗	?	✓
Critical Success Factors			
Business Need	✗	✗	✓
Strategic Fit	✗	✗	✓
Benefits Optimisation	✗	✗	✓
Potential achievability	✓	✓	✓
Supply side capability	✓	✓	✓
Affordability	✓	✓	?
Summary	Discounted	Discounted	Preferred

3.4. Service Solution Appraisal

Within this potential scope, options were considered using the options selection framework within the HM Treasury Five Case Model. As a result of the scoping appraisal, the potential service solutions that referred to Minimum and Intermediate scope (highlighted red) have been removed – with the exception of 'Do Nothing', which has been carried forward for comparative purposes.

3.4.1. Service solution long-List Options

Option	Long list option details	Scope
1	Do Nothing – continue existing maintenance.	Minimum scope
	Reinforce sea defences - Provide a short-term rock revetment in front of the existing highway. Similar to WelTAG Option 2a but for a limited time period.	Intermediate scope
	Maintain existing route (for maximum 20 years) - Upgrade Diversion Route (C3062-C3063-C3010) over time, to prepare for increased use. Will include community adaptations. WelTAG Option 10/11.	Intermediate scope
2	Reinforce sea defences with a permanent solution (i.e. a 6-metre high wall protecting the existing road). WelTAG Option 2b.	Maximum scope
3	Provide a raised road in the current location on a raised embankment. WelTAG Option 2c.	Maximum scope
4	Provide a bridge or culverted causeway in the current location to replace the existing highway. WelTAG Option 2d.	Maximum scope
5	Provide a new highway, a composite of using a smaller embankment to raise the road plus a sea wall to provide the required level of defence. WelTAG Option 2e.	Maximum scope
6	Provide a new highway route behind the Duke of Edinburgh Inn. Will include community adaptations, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). WelTAG Option 3a.	Maximum scope
7	Provide a viaduct behind the Duke of Edinburgh Inn, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 3b.	Maximum scope
8	Provide a new highway route on a raised embankment, behind the Duke of Edinburgh Inn, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 3c.	Maximum scope
9	Provide a new highway route (between Newgale farm and Wood farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 4.	Maximum scope
10	Provide a new highway route (between Newgale farm and Southwood farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 5.	Maximum scope
11	Provide a new highway route (between Pen-y-Cwm and Southwood Farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 6.	Maximum scope
12	Provide a new highway route a hybrid option of the Planning Stage Middle Corridor options (options 4, 5 and 6) and tying into the A487 to the south of Bay View Farm and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option J.	Maximum scope
13	Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 7.	Maximum scope
14	Provide an embankment or viaduct further inland to the A487; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 8.	Maximum scope
15	Provide a highway link from Roch, skirting the marshy land, crossing Brandy Brook at its eastern end, and re-joining the A487 around Penycwm; retain the existing highway with maintenance for a reasonable period of time (maximum 20 years) and will include community adaptations. WelTAG Option 9.	Maximum scope
16	Upgrade the existing diversion route (C3062-C3063-C3010), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. WelTAG Option 10/11.	Maximum scope

3.4.2. Advantages and Disadvantages

Table 3-4 Service solution appraisal - advantage and disadvantages

Option 1 - Do Nothing	
Advantages	**Disadvantages**
• No short-term disruption to Newgale. • No capital spend required immediately.	• Will not address the issue of the shingle ridge Retreat. • Will require repeated intervention intermittently over the next 20-years. • Provides a threat to the standard of road connectivity with the St David's Peninsula. • Disruption and road closures will occur more frequently with time • Uncertainty of continued service provision beyond 2036
Option 2 - Reinforce sea defences with a permanent solution (i.e. a 6-metre high wall protecting the existing road). (WelTAG option 2b)	
Advantages	Disadvantages
• Will ensure the safety and continuity of the existing highway. • Will provide connectivity with the St David's Peninsula. • Will ensure continuity for local businesses and protect house values in the Newgale area.	• Large capital investment required. • Would remove the 'iconic' view of Newgale and have a negative impact on tourism. • Would have a detrimental effect on the beach which would get lower over time and increased risk of denuding beach of sand. • Would not prevent tidal or fluvial flooding via the Brandy Brook. • Is not popular with stakeholders.
Option 3 - Reinforce sea defences with a permanent solution (i.e. a 6-metre high wall with a raised road). (WelTAG option 2c)	
Advantages	Disadvantages
• Will ensure the safety and continuity of the highway. • Will provide connectivity with the St David's Peninsula. • Will ensure continuity for local businesses and protect house values in the Newgale area.	• Large capital investment required. • Would remove the 'iconic' view of Newgale and have a negative impact on tourism. Would not prevent tidal or fluvial flooding via the Brandy Brook. • Would have a detrimental effect on the beach which would get lower over time and increased risk of denuding beach of sand. • Is not popular with stakeholders.
Option 4 - Provide a bridge or culverted causeway in the current location (i.e. a viaduct) to replace the existing highway. (WelTAG option 2d)	
Advantages	Disadvantages
• Uses existing route footprint, so reduces ecological impact. • Proposed solution would replicate the existing route corridor. • Maximises the use of the existing A487. • Will ensure the safety and continuity of the highway provision in Newgale. • Will provide connectivity with the St David's Peninsula. • Will ensure continuity for local businesses and protect house values in the Newgale area.	• Large capital investment required. • Would require a major structure to carry the road above the Brandy Brook flood plain. • Would require the demolition of the commercial/residential properties at the Northern end of the route. • Visual impact would be adverse because of the high road elevation. • Would remove the 'iconic' view of Newgale and have a negative impact on tourism.

	• The coast would continue to retreat and the viaduct would be over the beach in the future which would look incongruous.
Option 5 – Provide a new highway a composite of using a smaller embankment to raise the road plus a sea wall to provide the required level of defence. (WelTAG option 2e)	
Advantages	Disadvantages
• Will ensure the safety and continuity of the highway provision in Newgale. • Will provide connectivity with the St David's Peninsula. • Will ensure continuity for local businesses and protect house values in the Newgale area. • Proposed solution would replicate the existing route corridor.	• Large capital investment required. • Would require construction of substantial structures to form the embankment and sea wall. • Would require the demolition of the commercial/residential properties at the Northern end of the route. • Visual impact would be adverse because of the high road elevation. • Would remove the 'iconic' view of Newgale and have a negative impact on tourism. • Would have a detrimental effect on the beach which would get lower over time and increased risk of denuding beach of sand. • Is not popular with stakeholders.
Option 6 - Provide a new highway route behind the Duke of Edinburgh Inn, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 3a)	
Advantages	Disadvantages
• Shortest constructed route, with less environmental impact. • Proposed solution close to the existing route corridor. • Maximises the use of the existing A487. • Least visual impact for a new road option. • Will ensure the safety and continuity of the highway. • Will provide connectivity with the St David's Peninsula. • Will ensure continuity for local businesses and protect house values in the Newgale area. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Road would be susceptible to flooding. • Would require the demolition of the commercial/residential properties at the Northern end of the route. • New route potentially located through the popular Newgale camping site. • Fewer improvements to the A487 with HGVs still having to use the steep Newgale Hill.
Option 7 - Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 3b)	
Advantages	Disadvantages
• Shortest constructed route, with less environmental impact. • Proposed solution close to the existing route corridor. • Maximises the use of the existing A487. • Has strong public support. • Will ensure the safety and continuity of the highway. • Will provide connectivity with the St David's Peninsula. • Will ensure continuity for local businesses and protect house values in the Newgale area. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would require a major structure to carry the road above the Brandy Brook flood plain. • Would require the demolition of the commercial/residential properties at the Northern end of the route. • Visual impact would be potentially adverse because of the prominent position. • New structure would be located through the popular Newgale camping site. • Fewer improvements to the A487 with HGVs still having to use the steep Newgale Hill.

Option 8 - Provide a new highway route on a raised embankment, behind the Duke of Edinburgh Inn, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 3c)	
Advantages	Disadvantages
• Shortest route. • Proposed solution close to the existing route corridor. • Maximises the use of the existing A487. • Will ensure the safety and continuity of the highway. • Will provide connectivity with the St David's Peninsula. • Will ensure continuity for local businesses and protect house values in the Newgale area. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would require a major embankment structure to provide a road above the design flood levels. • Would require the demolition of the commercial/residential properties at the Northern end of the route. • Visual impact would be adverse because of the high road elevation and large embankment footprint. • New embankment would be located through the popular Newgale camping site. • Fewer improvements to the A487 with HGVs still having to use the steep Newgale Hill.
Option 9 - Provide a new highway route (between Newgale farm and Wood farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 4).	
Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would provide an improvement to part of the highway network. • Would reduce traffic through Newgale village. • Does not require any demolitions. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would require extensive earthworks. • Major adverse impact on landscape character, features and visual amenity contrary to the objectives of the National Park. • Negative impact on bio-diversity, contrary to the objectives of the National Park. • Community adaptions would be challenged by distance of route away from Newgale.
Option 10 - Provide a new highway route (between Newgale farm and Southwood farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 5).	
Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would provide an improvement to the highway network. • Would reduce traffic through Newgale village. • Does not require any demolitions. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would require extensive earthworks. • Major adverse impact on landscape character, features and visual amenity contrary to the objectives of the National Park. • Negative impact on bio-diversity, contrary to the objectives of the National Park. • Community adaptions would be challenged by distance of route away from Newgale.
Option 11 - Provide a new highway route (between Pen-y-Cwm and Southwood Farm), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 6).	
Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would provide an improvement to the highway network. • Would reduce traffic through Newgale village.	• Large capital investment required. • Would require extensive earthworks. • Major adverse impact on landscape character, features and visual amenity contrary to the objectives of the National Park.

• Does not require any demolitions. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Negative impact on bio-diversity, contrary to the objectives of the National Park. • Community adaptions would be challenged by distance of route away from Newgale.
Option 12 - Provide a new highway route a hybrid option tying into the A487 to the south of Bay View Farm and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option J)	
Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would provide an improvement to the highway network, by improving journey times. • Would reduce traffic through Newgale village. • Provides the best access to the 'iconic' view of the inland routes. • No demolition required and only minor impact on other land (i.e. Southwood Lodge) • Has strong public support. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would contain a number of departures from highways standards. • Adverse impact on landscape character, existing features and visual amenity. • Negative impact on bio-diversity. • The route has an appearance of a disjointed route at its southern end and will be discontinuous as it will require a roundabout. • A roundabout requiring signs/lighting would be required for this option which would cause light pollution. • Community adaptions would be challenged by distance of route away from Newgale.
Option 13 - Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 7)	
Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would provide an improvement to the highway network, by improving journey times. • Would reduce traffic through Newgale village. • Does not require any demolitions. • Most direct route linking A487 between Roch and Penycwm. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would contain a number of departures from highways standards. • Significant engineering challenges. • Would be a difficult road for drivers to traverse. • Adverse impact on landscape character, features and visual amenity. • Negative impact on bio-diversity. • Community adaptions would be challenged by distance of route away from Newgale.
Option 14 - Provide an embankment or viaduct further inland to the A487; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 8)	
Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would provide an improvement to part of the highway network. • Would reduce traffic through Newgale village. • Does not require any demolitions. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would require substantial earthworks. • Major adverse impact on landscape character, features and visual amenity. • Negative impact on bio-diversity, contrary to the objectives of the National Park. • Community adaptions would be challenged by distance of route away from Newgale.
Option 15 – Provide a highway link from Roch, skirting the marshy land, crossing Brandy Brook at its eastern end, and re-joining the A487 around Penycwm, retain the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 9).	

Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would provide an improvement to the highway network. • Would reduce traffic through Newgale village. • Does not require any demolitions. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Would require extensive earthworks. • Major adverse impact on landscape character, features and visual amenity. • Negative impact on bio-diversity, contrary to the objectives of the National Park. • Community adaptions would be challenged by distance of route away from Newgale.
Option 16 – Upgrade the existing diversion route (C3062-C3063-C3010), retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations. (WelTAG option 11).	
Advantages	Disadvantages
• Would provide a new route which would not be vulnerable to coastal change and so ensures connectivity with the St David's Peninsula. • Would reduce traffic through Newgale village. • Does not require any demolitions. • Community adaptations will ensure car parking and linkages to beach and village is provided.	• Large capital investment required. • Closest to Scheduled Ancient Monument • Longest route out of the options considered. • Substantial departures for standards for the horizontal alignment of the road. • Would be a difficult road for drivers to traverse. • Most costly option considered. • Increases greenhouse gas emissions. • Increases noise to the greatest number of receptors. • Has the largest land-take of Best and Most Versatile land. • Lack of public support. • Route is furthest away from Newgale and despite community adaptation the village would be remote from the A487.

3.4.3. Conclusion

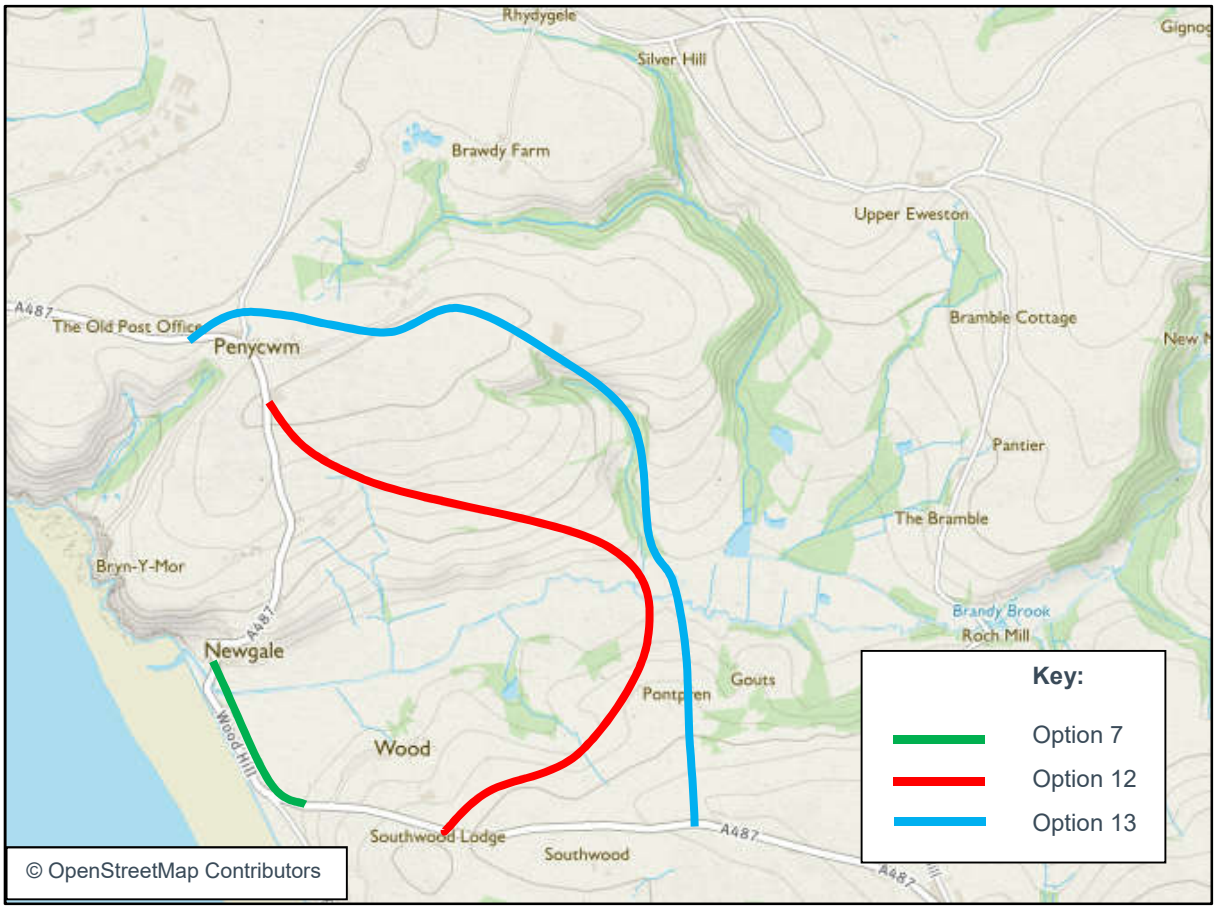
Table 3-5 Service solution appraisal - conclusions

Reference to: Option	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(WelTAG option references)	DN	2b	2c	2d	2e	3a	3b	3c	4	5	6	J	7	8	9	11
Investment Objectives																
1. To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. To minimise the impact and adverse effects, caused by traffic and associated infrastructure, on the natural environment, beauty, wildlife and cultural heritage of the Pembrokeshire Coast National Park.	✓	✗	✗	✗	✗	✓	?	✗	✗	✗	✗	?	?	✗	✗	✗
3. To maintain an attractive, safe and well- connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. To protect the fabric, community and iconic nature of Newgale, while allowing the natural evolution of the coastline.	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.	✗	?	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Critical Success Factors																
Business Need	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strategic Fit	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Benefits Optimisation	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓	✓	✗	✗	?
Potential achievability	✓	✓	✓	✓	✓	✓	✓	✗	?	?	✗	✓	✓	?	?	✗
Supply side capability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Affordability	✓	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Summary	C/F	Discounted	Discounted	Discounted	Discounted	Discounted	Possible	Discounted	Discounted	Discounted	Discounted	Possible	Possible	Discounted	Discounted	Discounted

Following this summary assessment, the short-listed options taken forward for Economic appraisal are:

- **Option 1** – Do Nothing, carried forward as a comparator only, as it only meets 1/5 Investment Objectives and 3/6 Critical Success Factors.
- **Option 7** – Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retain the existing road for 20 years. Will include community adaptations. This option met 5/6 of the Investment Objectives and definitively meets 5/6 Critical Success Factors.
- **Option 12** - Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retain the existing road. Will include community adaptations. This option met 5/6 of the Investment Objectives and definitively meets 5/6 Critical Success Factors.
- **Option 13** - Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the existing road for 20 years. Will include community adaptations. This option met 5/6 of the Investment Objectives and definitively meets 5/6 Critical Success Factors.

Figure 3-1 Map of shortlisted options



3.5. Service Delivery Appraisal

Service delivery options are required for the project management and design of the preferred scheme and the eventual construction of the scheme.

3.5.1. Service delivery options

- Option 1 - Minimum - Local Authority delivery
- Option 2 - Intermediate – Strategic partnership with other government agencies
- Option 3 - Intermediate – Strategic partnership with charity bodies and volunteers
- Option 4 - Maximum – Private Sector partnership arrangements
- Option 5 - Maximum – Combined multi-agency, charity and volunteer bodies partnership

3.5.2. Advantages and Disadvantages

Table 3-6 Service delivery appraisal - advantages and disadvantages

Option 1 - Do Minimum – Local Authority delivery	
Advantages	Disadvantages
• Capability and resource within local authority to deliver projects.	• Resource limitations mean there is a need to outsource design and construction aspects. • Budget limitations. • Significant capital projects require WG grant support and approval.
Option 2 - Intermediate: Strategic partnership with other government agencies	
Advantages	Disadvantages
• Provides holistic approach to coastal and flood management. • Access to different sources of funding.	• The need to identify common objectives to unlock funding. • Need to outsource design and construction aspects. • A joint working partnership would need to be established.
Option 3 - Intermediate: Strategic partnership with charity bodies and volunteers	
Advantages	Disadvantages
• Provides an opportunity for joint delivery of community projects. • Access to different sources of funding. • Potential to save outsourcing some construction/implementation work.	• The need to identify common objectives to unlock funding. • Need to outsource design and construction aspects. • A joint working partnership would need to be established.
Option 4 - Maximum: Private Sector Partnership arrangements	
Advantages	Disadvantages
• Access to different sources of funding. • Provides additional management resource.	• No mechanism to provide return on investment for private funders. • No single large business dependant on the road.
Option 5 - Maximum: Combined multi-agency, charity and volunteer bodies partnership	
Advantages	Disadvantages
• Provides a holistic approach to adaptation needs. • Provides an opportunity for joint delivery of community projects. • Access to different sources of funding. • Potential to save outsourcing some construction/implementation work. • Provides additional management resource.	• The need to identify common objectives to unlock funding. • Need to outsource design and construction aspects. • A joint working partnership would need to be established. • More complex management arrangements needed.

3.5.3. Conclusion

Table 3-7 Service delivery appraisal - conclusion

Reference to:	Option 1: Do Nothing/ Minimum	Option 2: Inter-mediate option	Option 3: Inter-mediate option	Option 4: Maximum option	Option 5: Maximum option
Investment Objectives					
1. To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	✓	✓	✓	×	✓
2. To minimise the impact and adverse effects, caused by traffic and associated infrastructure, on the natural environment, beauty, wildlife and cultural heritage of the Pembrokeshire Coast National Park.	✓	✓	✓	×	✓
3. To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	×	×	?	×	✓
4. To protect the fabric, community and iconic nature of Newgale, while allowing the natural evolution of the coastline.	×	×	?	×	✓
5. To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.	✓	✓	✓	×	✓
Critical Success Factors					
Business Need	✓	✓	✓	×	✓
Strategic Fit	✓	✓	✓	×	✓
Benefits optimisation	✓	✓	✓	×	✓
Potential achievability	✓	✓	?	×	?
Supply side capability	?	?	?	✓	✓
Affordability	?	?	?	?	?
Summary	Carried forward	Possible	Possible	Discounted	Preferred

Following this summary assessment, the service delivery options taken forward are:

Option 1: Do Nothing, Local Authority Delivery, is carried forward as this option provides the default position and can be used as a comparator. This option meets 3/5 Investment Options and definitely 4/6 Critical Success Factors.

Option 2: Strategic partnership with other government agencies meets 3/5 Investment Options and definitely 4/6 Critical Success Factors.

Option 3: Strategic partnership with charity bodies and volunteers meets 3/5 Investment Options and definitely 3/6 Critical Success Factors.

Option 4: Private Sector partnership arrangements. This option has been discounted as is does not meet any of the Investment Objectives and only 1/6 Critical Success Factors.

Option 5: Combined multi-agency, charity and volunteer bodies partnership. This option is preferred as it meets all of the Investment Objectives and definitely 4/6 Critical Success Factors.

3.6. Implementation Appraisal

3.6.1. Implementation options

- Option 1 - Do Minimum - Construct new road over a 2 year period.
- Option 2 - Intermediate – Construct new road over a 2 year period and raise car parks with material arising.
- Option 3 - Intermediate – Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village.
- Option 4 - Intermediate – Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village. When road is lost to erosion (assumed to be in 2036), decommission road, commence habitat creation and remove Brandy Brook Bridge to allow re-routing of river.
- Option 5 - Maximum – Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village. When road is lost, decommission road, commence habitat creation and remove Brandy Brook Bridge to allow re-routing of river. The independent developments are put in place before the existing road is lost.

3.6.2. Advantages and Disadvantages

Table 3-8 Implementation appraisal - advantages and disadvantages

Option 1 - Do Minimum: Construct the road over a 2 year period	
Advantages	Disadvantages
• A single project to implement.	• Does not consider future needs.
Option 2 - Intermediate: Construct new road over a 2 year period and raise car parks with material arising.	
Advantages	Disadvantages
• Makes economic use of excess materials • Provides some of the community adaptations	• Does not consider all future needs
Option 3 – Intermediate: Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village.	
Advantages	Disadvantages
• Makes economic use of excess materials • Provides more of the community adaptations	• Does not consider all future needs
Option 4 – Intermediate: Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village. When road is lost, decommission road, commence habitat creation and remove Brandy Brook Bridge to allow re-routing of river.	
Advantages	Disadvantages
• Makes economic use of excess materials • Provides more of the community adaptations	•
Option 5– Maximum: Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village. When road is lost, decommission road, commence habitat creation and remove Brandy Brook Bridge to allow re-routing of river. The independent developments are put in place before the existing road is lost.	
Advantages	Disadvantages
• Makes economic use of excess materials • Provides all of the community adaptations • Enables development in the community	• Needs careful coordination across the various sub-projects.

3.6.3. Conclusion

Table 3-9 Implementation appraisal - conclusion

Reference to:	Option 1: Do Minimum	Option 2: ntermediate Option	Option 3: Intermediate Option	Option 4: Intermediate Option	Option 5: Maximum Scope
Investment Objectives					
1. To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	✓	✓	✓	✓	✓
2. To minimise the impact and adverse effects, caused by traffic and associated infrastructure, on the natural environment, beauty, wildlife and cultural heritage of the Pembrokeshire Coast National Park.	✓	✓	✓	✓	✓
3. To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	×	×	✓	✓	✓
4. To protect the fabric, community and iconic nature of Newgale, while allowing the natural evolution of the coastline.	×	×	×	✓	✓
5. To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.	✓	✓	✓	✓	✓
Critical Success Factors					
Business Need	×	×	×	✓	✓
Strategic Fit	×	×	×	✓	✓
Benefits optimisation	✓	✓	✓	✓	✓
Potential achievability	✓	✓	?	?	?
Supply side capability	✓	✓	✓	✓	✓
Affordability	✓	✓	?	?	?
Summary	C/F	Discounted	Discounted	Preferred	Possible

Following this summary assessment, the implementation options taken forward are:

Option 1: Do Minimum - Construct new road over a 2 year period, is carried forward as this option provides the default position and can be used as a comparator. This option meets 3/5 Investment Options and 4/6 Critical Success Factors.

Option 2: Intermediate – Construct new road over a 2 year period and raise car parks with material arising, Discounted as the option fails to meets 2/5 Investment Options and 2/6 Critical Success Factors.

Option 3: Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village. Discounted, as it meets 4/5 Investment Options, but only definitively 2/6 Critical Success Factors.

Option 4: Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village. When road is lost to erosion, decommission road, commence habitat creation and remove Brandy Brook Bridge to allow re-routing of river. This option is preferred as it meets all of the Investment Objectives and potentially all of the Critical Success Factors.

Option 5: Construct new road over a 2 year period and raise car parks, carry out access improvements through valley and to beach and village. When road is lost to erosion, decommission road, commence habitat creation and remove Brandy Brook Bridge to allow re-routing of river. The independent developments are put in place before the existing road is lost. This option meets all of the Investment Objectives and potentially all off the Critical Success Factors. However, this option only differs from Option 4 because of the involvement of independent development. This may be an aspect out of control of the delivery body as the planning applications for these developments will be separate to the main scheme.

3.7. Funding Appraisal

3.7.1. Funding options

- Option 1 - Do Minimum –Wholly Local Authority funded from capital programme;
- Option 2 - Intermediate – Mix of Local Authority borrowing and Welsh Government funding;
- Option 3 - Maximum – Wholly Welsh Government grant funded and with additional support from other government agencies and charity bodies, including benefits in kind from volunteers.
- Option 4 - Maximum – Wholly Welsh Government grant funded.

3.7.2. Advantages and Disadvantages

Table 3-10 Funding appraisal – advantages and disadvantages

Option 1 - Do Minimum: Wholly Local Authority funded from capital programme;	
Advantages	Disadvantages
• Will not impact on future Government grant levels.	• Unlikely to be able to fund the community adaptations • Depletes council budget for other critical functions or defers other highway schemes in the pipeline.
Option 2 - Intermediate: Mix of Local Authority borrowing and Welsh Government funding;	
Advantages	Disadvantages
• Provides some support for council services. • More likely to be able to fund the community adaptations	• Some uncertainty about funding of community adaptions. Likely to be a reduced scope. • Depletes council budget for other critical functions or defers other highway schemes in the pipeline. May be mitigated if percentage contribution is low.
Option 3 - Intermediate: Wholly Welsh Government grant funded and with additional support from other government agencies and charity bodies, including benefits in kind from volunteers.	
Advantages	Disadvantages
• Provides some support for council services. • Provides funding for more of the community adaptations	• Potential to influence longer term reduction in WG grants for PCC
Option 4 - Maximum: Wholly Welsh Government grant funded.	
Advantages	Disadvantages
• Does not disrupt local authority budgets	• Some uncertainty about funding of community adaptions. Likely to be a reduced scope.

3.7.3. Conclusion

Table 3-11 Funding appraisal - conclusions

Reference to:	Option 1: Do Minimum	Option 2: Intermediate Scope	Option 3: Intermediate Scope	Option 4: Maximum Scope
Investment Objectives				
1. To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	✓	✓	✓	✓
2. To minimise the impact and adverse effects, caused by traffic and associated infrastructure, on the natural environment, beauty, wildlife and cultural heritage of the Pembrokeshire Coast National Park.	✓	✓	✓	✓
3. To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	x	?	✓	?
4. To protect the fabric, community and iconic nature of Newgale, while allowing the natural evolution of the coastline.	x	?	✓	?
5. To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.	✓	✓	✓	✓
Critical Success Factors				
Business Need	x	x	✓	x
Strategic Fit	x	x	✓	x
Benefits optimisation	✓	✓	✓	✓
Potential achievability	✓	✓	?	?
Supply side capability	✓	✓	✓	✓
Affordability	✓	✓	?	?
Summary	C/F	Possible	Preferred	Possible

Option 1 - Do Minimum –Wholly Local Authority funded from capital programme. This option meets 3/5 Investment Options and 4/6 Critical Success Factors.

Option 2 - Intermediate – Mix of Local Authority borrowing and Welsh Government funding. This option meets 3/5 Investment Options and 4/6 Critical Success Factors.

Option 3 - Maximum – Wholly Welsh Government grant funded and with additional support from other government agencies and charity bodies, including benefits in kind from volunteers. This option is preferred as it meets all the Investment Options and definitely 4/6 Critical Success Factors.

Option 4 - Maximum – Wholly Welsh Government grant funded. This option meets 3/5 Investment Options and definitely 3/6 Critical Success Factors

3.8. Summary of appraisals

Table 3-12 Summary of appraisals

Scope	Minimum – maintain the A487 and Newgale beach		Intermediate – coastal defences with limited construction		Maximum – coastal defences or new highway with significant construction											
Service Solution	1 Do Nothing (Minimum)	2 Sea defences retain road (behind 6m wall)	3 Sea defences and raised road (on 6m wall)	4 Bridge or culverted causeway to replace A487	5 New highway on a raised embankment and sea wall	6 New highway route behind DoE pub to replace A487	7 Viaduct and new road behind DoE pub to replace A487	8 New highway on raised embankment behind DoE pub – to replace A487	9 New highway between Newgale farm and Wood farm – to replace A487	10 New highway route between Newgale farm and Southwood farm - to replace A487	11 New highway route between Pen-y--Cwm and Southwood farm - to replace A487	12 New highway route tying into the A487 to the south of Bay View Farm and east of Wood Farm at is southern end	13 New highway route on existing track (Pen-y-Cwm to Llethr-Brawdy Mill)	14 Provide an embankment or viaduct inland to A487	15 Provide a highway link from Roch, re-joining the A487 near Pen-y-Cwm	16 Upgrade the existing diversion route (C3062-C3063-C3010)
Service Delivery	Do Minimum, Local Authority Delivery		Intermediate 1 – Strategic partnership with other government agencies		Intermediate 2 – Strategic partnership with charity bodies and volunteers		Maximum 1 – Private Sector partnership arrangements		Maximum 2 – Combined multi-agency, charity and volunteer bodies partnership							
Implementation	Do Minimum - Construct new road over a 2-year period		Intermediate – Construct new road over a 2-year period and raise car parks with material arising		Maximum 1 - Construct new road over a 2-year period and raise car parks, carry out access improvements through valley and to beach and village		Maximum 2 - Construct new road over a 2-year period and raise car parks, carry out access improvements through valley and to beach and village, to include habitat creation		Maximum 3 - Construct new road over a 2-year period and raise car parks, carry out access improvements through valley and to beach and village, to include habitat creation before current road is lost							
Funding	Do Minimum – wholly Local Authority funded from Capital Programme		Intermediate – mix of Local Authority funding and Welsh Government grant		Maximum 1 – Wholly Welsh Government grant funded, with support from other Government agencies		Maximum 2 – Wholly Welsh Government grant funded									

3.9. Economic appraisal

3.9.1. Estimating costs

The methodology used for the economic appraisals is detailed in Appendix A.

3.9.2. Net present cost findings

The detailed economic appraisals for each option are attached in Appendix A Economic and Financial Analysis. The short-listed options have been risk-adjusted to account for the 'risk retained' (in £s) by the organisation under each option.

The following tables summarises the key results of the economic appraisals for each option.

Table 3-13 Net present cost - Option 1

Option 1: Do Nothing (20 years)		
	Undiscounted (£'000s)	**Net Present Cost (£'000s)**
Opening Value (Opportunity Cost)	10,133	10,133
Revenue Costs	700	490
Lifecycle Costs	380	279
Total costs	**11,213**	**10,902**
Plus: Economic dis-benefits[42]	4,165	2,894
Total	**15,378**	**13,796**

[42] The economic benefits are derived from Table 2-20 of this report.

Table 3-14 Net present cost - Option 7

Option 7 (previously option 3b): Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)		
	Undiscounted (£'000s)	**Net Present Cost (£'000s)**
Opening value	9,151	9,151
Construction Capital	14,165	12,027
Coastal adaptations	2,207	1,586
Lifecycle Costs	3,287	1,149
Revenue/Current Cost	1,380	686
Risk Retained	3,175	2,786
Optimism Bias	4,136	3,843
Total costs	**37,501**	**31,228**
Plus Land purchase (less capital receipts)	531	463
Costs net cash savings	38,032	31,691
Total	**38,032**	**31,691**

Table 3-15 Net present cost - Option 12

Option 12 (previously option J): Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)		
	Undiscounted (£'000s)	**Net Present Cost (£'000s)**
Opening value	6,243	6,243
Construction Capital	10,459	8,846
Coastal adaptations	2,525	1,820
Lifecycle Costs	2,159	744
Revenue/Current Cost	1,486	726
Risk Retained	2,810	2,459
Optimism Bias	3,433	3,188
Total costs	**29,115**	**24,026**
Plus Land purchase (less capital receipts)	631	552
Costs net cash savings	29,745	24,578
Total	**29,745**	**24,578**

Table 3-16 Net present cost - Option 7

Option 13 (Previously option 7): Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)		
	Undiscounted (£'000s)	**Net Present Cost (£'000s)**
Opening value	3,635	3,635
Construction Capital	13,381	11,282
Coastal adaptations	2,525	1,820
Lifecycle Costs	2,350	772
Revenue/Current Cost	1,486	726
Risk Retained	3,410	3,025
Optimism Bias	4,123	3,832
Total costs	**30,910**	**25,091**
Plus Land purchase (less capital receipts)	756	661
Costs net cash savings	31,666	25,752
Total	**31,666**	**25,752**

A summary of the detailed economic appraisals undertaken for each of the short-listed options are summarised in the table below, which shows the key results of the economic appraisals for each option.

Table 3-17 Summary of net present cost

Option	Description	Undiscounted (£'000s)	Net Present Cost (£'000s)
1	Do Nothing	15,378	13,796
7 (previously WelTAG option 3b)	Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)	38,032	31,691
12 (previously WelTAG option J)	Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)	29,745	24,578
13 (previously WelTAG option 7)	Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations (60 years)	31,666	25,752

Effect of value of ecosystems services

An assessment of the value of ecosystems services is presented in Appendix D. For the ecosystems value identified which is in the range of £35,000-£490,000 across options 7(3b), 12(J) and 13(7), this will produce:

A 60-year undiscounted cost range of £1.8m-£29.4m; and

An NPV (60 year) of £0.786m - £12.852m.

These values can count as benefits towards the economic appraisal, but this has not been included at this stage.

3.9.3. Equivalent Annual Cost (EAC) & Economic Ranking

As the options are not considered over a consistent period of time (i.e. Do Nothing is appraised over 20 years, while the remaining options are appraised over 60 years), the Net Present Cost outcome does not give a true economic comparison.

Therefore, the EAC approach has been used to identify the most economically advantageous option (using Welsh Government's Economic Appraisal spreadsheet). The EAC comparison has been completed on the appraisal excluding optimism bias. On this basis, the Economic Ranking is shown in the table below:

Table 3-18 Economic ranking of options

Option	EAC (£m)	Ranking
Option 1: Do Nothing	0.94	3
Option 7 (previously option 3b): Provide a viaduct behind the Duke of Edinburgh pub, to replace the existing highway, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations	1.1	4
Option 12 (previously option J): Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations	0.81	1
Option 13 (Previously option 7): Provide a new highway route partially on existing road and track: 'Penycwm – Llethr – (Site of) Brawdy Mill' – new road to include crossing of Brandy Brook; retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations	0.83	2

3.10. Qualitative benefits appraisal

3.10.1. Qualitative benefits criteria

The WelTAG 2017 report, provided a qualitative assessment of impacts against the WelTAG Welsh Impact Areas for each of the shortlisted options. It was decided to carry this assessment forward into the SOC/OBC and to list the potential benefits against a set of criteria:

Table 3-19 Qualitative benefits for each criteria

Criteria Area	Benefits
Transport Economic Efficiency	• Improve the efficient, reliable and sustainable movement of people. • Improve the efficient, reliable and sustainable movement of vehicles. • Travel time savings. • Reductions in vehicle operating costs.
Noise	• Improve the impact of traffic on the local environment. • Provide a benefit to people through reduction in noise levels.
Greenhouse Gas Emissions	• Reduce the contribution of transport on the local network to greenhouse gas emissions.
Local Air Quality	• Reduce the contribution of transport on the local network to air pollution and other harmful emissions.
Landscape and Townscape	• Minimises the impact of new infrastructure on landscape/townscape. • Minimises the long terms effects on landscape and townscape. • Delivers enhancements to landscape/townscape.
Bio-diversity	• Minimises the potential impacts of new infrastructure on biodiversity and earth heritage features. • Delivers enhancements or adaptations to improve biodiversity.
Heritage	• Avoids or minimises impacts on heritage resources. • Delivers enhancements to heritage resources.
Water environment	• Avoids or minimises impacts on the water environment.
Soils	• Avoids or minimises the demolition of private property. • Minimises the loss of land used by the community. • Minimises the effects on development land.

Criteria Area	Benefits
	• Delivers improvements or enhancements.
Transport safety	• Has a positive effect on accident frequency or severity. • Improved the perceived safety of travel.
Permeability	• Improves the ability of people to use non-motorised modes of transport thereby encouraging healthier lifestyles and promoting enjoyment of the National Park. • Increase freedom of movement – the capacity to travel in any given direction without obstruction by a transport route. • An increase in the capacity to reach key services.
Physical fitness	• Provides an increase in the use of active travel modes.
Social Inclusion	• Social inclusion is enhanced by increased accessibility. • Non-car users have improved access to walking, cycling or public transport. • Improved access to healthcare, education, training, life-long learning, shopping and leisure facilities.
Equality, Diversity & Human Rights	• Positive impacts arising from infrastructure with regard to people with disabilities, specifically travel time to hospital. • The infrastructure options do not discriminate on any groups of Race, ethnicity, colour or nationality; Sex or marital status; Religion or belief; Sexual orientation; Welsh language; and Age; Other: Lone parent, economic inactivity, social and multiple deprivation.

3.10.2. Qualitative Benefits Scoring

The benefits were assessed against the following criteria:

Table 3-20 Qualitative benefits scoring

Score	Criteria
+3	Large benefit
+2	Moderate benefit
+1	Slight benefit
0	Neutral
-1	Minor adverse
-2	Moderate adverse
-3	Very large adverse

3.10.3. Benefit Appraisal Results

The scores carried forward from the WelTAG 2017 report into this SOC/OBC for the benefit appraisal is shown below:

Table 3-21 Benefits appraisal results

Criteria Area	Scores			
	Option 1: Do Nothing	Option 7 (3b)	Option 12 (J)	Option 13 (7)
Transport Economic Efficiency	-3	2	3	3
Noise	0	0	1	1
Local Air Quality	-2	0	-1	0
Greenhouse Gas Emissions	-2	1	-1	-1
Landscape and townscape	-1	-2	-2	-2
Bio-diversity	-3	-1	-3	-3
Heritage	-1	-1	-2	-2
Water environment	-1	-2	-2	-2
Soils	0	0	0	0
Transport safety	-3	1	2	2
Permeability	-2	1	0	-1
Physical fitness	0	0	1	0
Social inclusion	-2	1	1	1
Total (Criteria area)	**-20**	**0**	**-3**	**-4**

Rank (Criterial area)	4	1	2	3
Investment Objectives	**Option 1: Do Nothing**	**Option 7 (3b)**	**Option 12 (J)**	**Option 13 (7)**
IO 1 - To maintain sustainable long-term connectivity between the St David's Peninsula, Haverfordwest and the Trunk Road Network in the context of coastal change.	-3	3	3	3
IO2 - To provide the optimal solution in terms of impact to the Pembrokeshire Coast National Park.	-1	-2	-3	-3
IO3 - To maintain an attractive, safe and well-connected community which sustains well-being through maintaining livelihoods and ensuring future opportunities for prosperity.	-3	2	3	3
IO4 - To protect the fabric, community, iconic nature and visual aspect of Newgale, while allowing the natural evolution of the coastline.	-3	1	3	2
IO5 - To provide infrastructure which sustains business, tourism and regeneration to the wider economy of the St David's Peninsula.	-3	1	1	1
Total (Investment Objectives)	**-13**	**5**	**7**	**6**
Rank against Investment Objectives	**4**	**3**	**1**	**2**

Table 3-22 Summary of qualitative benefits overall results

	Option 1	Option 7 (3b)	Option 12 (J)	Option 13 (7)
Ranking against criteria	4	1	2	3
Ranking against Investment Objectives	4	3	1	2
Overall Ranking	**4**	**2**	**1**	**3**

The key considerations which affected the scores achieved by the shortlisted options were as follows:

Option 1
This option ranks last of the shortlisted options, does not deliver any positive benefits or fulfil any investment objectives with a score of -20 against the benefits criteria and -13 against the Investment Objectives.

The 'Do Nothing' option is considered to be the worst because it has a large economic dis-benefit, associated with the economic cost of road closures as a result of coastal change.

Option 7 (3b)
This option ranks 1st of the shortlisted options (against the benefits criteria), with a score of 0. However, the option only ranks 3rd (out of 4) of the shortlisted options against Investment Objectives, with a score of 5.

Option 12 (J)

This option ranks 2nd of the 4 shortlisted options, with a score of -3 against the benefits criteria. However, this option ranks 1st of the 4 shortlisted options with a score of 7 against the Investment Objectives.

Option 13 (7)

This option ranks 3rd of the shortlisted options, with a score of -4 against the benefits criteria.

This option ranks 2nd of the 4 shortlisted options with a score of 6 against the Investment Objectives.

3.11. Risk appraisal

Full risks were developed for each short-listed option, which can be seen in a series of Risk Registers, shown at Appendix B to this SOC/OBC.

Below is a summary of the risk values for each option, and the Option rankings in terms of those values.

Table 3-23 Option risk ranking

	Option 1	Option 7 (3b)	Option 12 (J)	Option 13 (7)
Risk values (actual £m)	0	3.175	2.810	3,410
Overall Ranking	**1**	**3**	**2**	**4**

Within this assessment, Option 1 (Do Nothing) is ranked 1st, as there is no associated risk. Option 12 (Previously Option J) is ranked 2/4, having over £350k less risk than the nearest rival (Option 7, previously 3b) and £600k less risk than Option 13 (previously 7).

3.12. The Preferred Option

Table 3-24 Summary of overall results

	Option 1	Option 7 (3b)	Option 12 (J)	Option 13 (7)
Economic appraisals (EAC)	3	4	1	2
Benefits appraisal (Combined)	4	2	1	3
Risk appraisal (risk value £m)	1	3	2	4
Overall Ranking	**2**	**=3**	**1**	**=3**

The preferred option, and therefore scheme to be taken forward, is Option 12 (previously Option J) - Provide a highway link, tying into the A487 to the south of Bay View Farm at its northern end and east of Wood Farm at its southern end, retaining the existing highway with maintenance for a reasonable period of time (maximum 20 years). Will include community adaptations.

Option 1 – the Do Nothing option, although marked 2nd does not deliver any positive benefits or fulfil any investment objectives and it has a large economic disbenefit associated with the economic cost of road closures as a result of coastal change.

Option 7 (previously 3b) which ranks equal with option 13 (previously 7) has a higher EAC and Option 7 (3b) has a Net Present Cost of £31.663m which is significantly more than the cost of Option 12 (J) at £24.549m.

3.13. Monte Carlo Analysis

To make scenario planning more robust (and less linear), we have completed a Monte Carlo Simulation in this business case. The Monte Carlo acts as the Sensitivity Analysis and covers all 'what if' positions. It takes every aspect of the Economic appraisal (capital, revenue, risk, asset value, etc.) and runs thousands of possibilities.

The simulation uses the following cost elements as variables: capital build costs, coastal adaptions, recurring revenue costs, lifecycle costs (both capital and revenue) and land purchase costs. Monte Carlo simulation uses random number generation to provide a set of predictive results. Charting these results can allow you to determine the probability of a particular result or set of results occurring.

Each variable went through 1000 iterations of number generation to produce a Normal distribution of the potential results obtainable. A normal distribution was chosen as it has been assumed that the best and worst case scenarios are not subject to excessive skew in either direction. Once the variables for each option were simulated, the results were used as the input for 27 different potential 'What if' scenarios based along the three dimensions of capital, revenue and savings. The scenarios were used to demonstrate the sensitivity between the different variables, providing 27 (+1 base value) different potential outcomes for NPC per option, as shown in Appendix A.

Finally, the mean and standard deviation values for the scenarios were used as the input variables for a further 1000 iterations of the simulation to produce a final Normal distribution curve for each of the four shortlisted options. The results are demonstrated in the two charts below (Option 1 excluded from the charts due to its extreme variance from the other options).

Table 3-25 Monte Carlo simulation : Cumulative probabilities

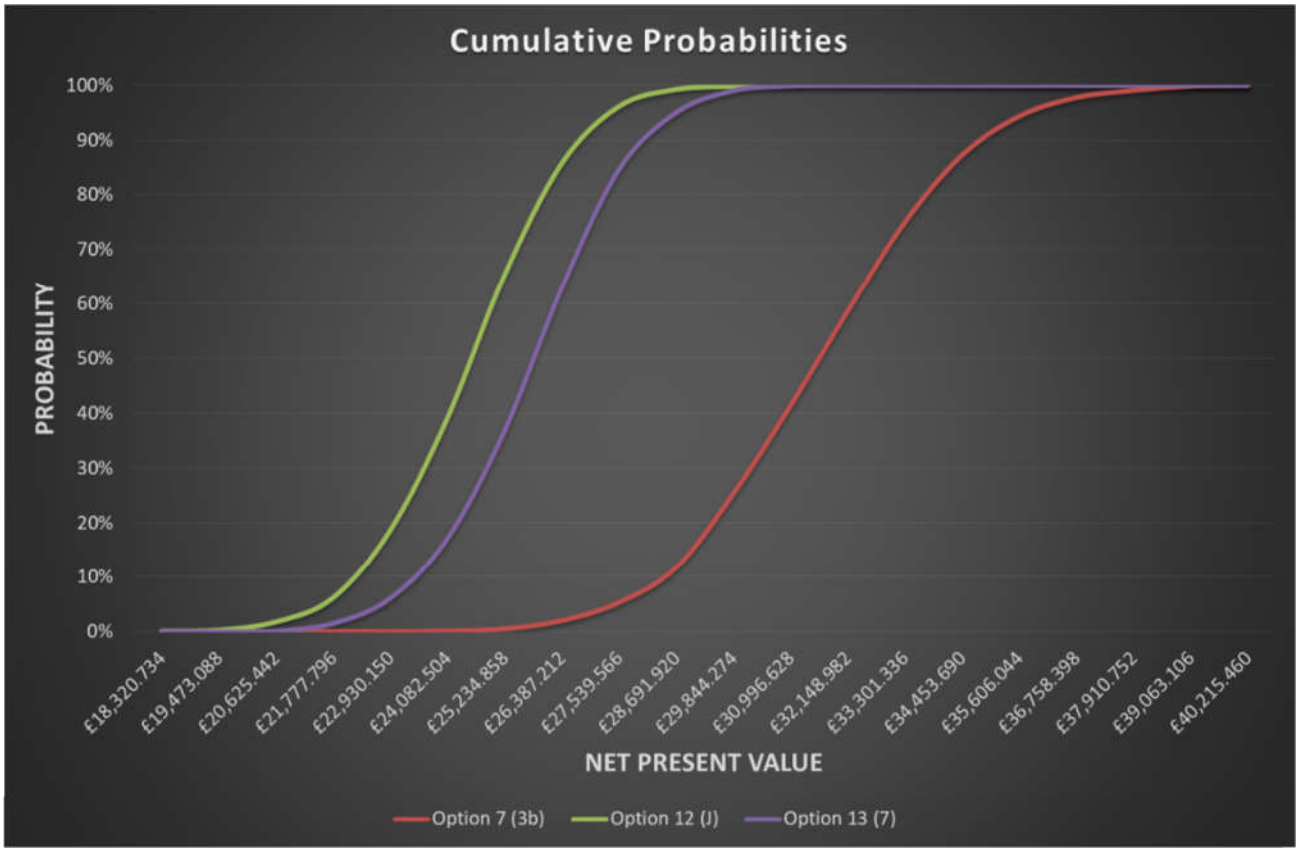
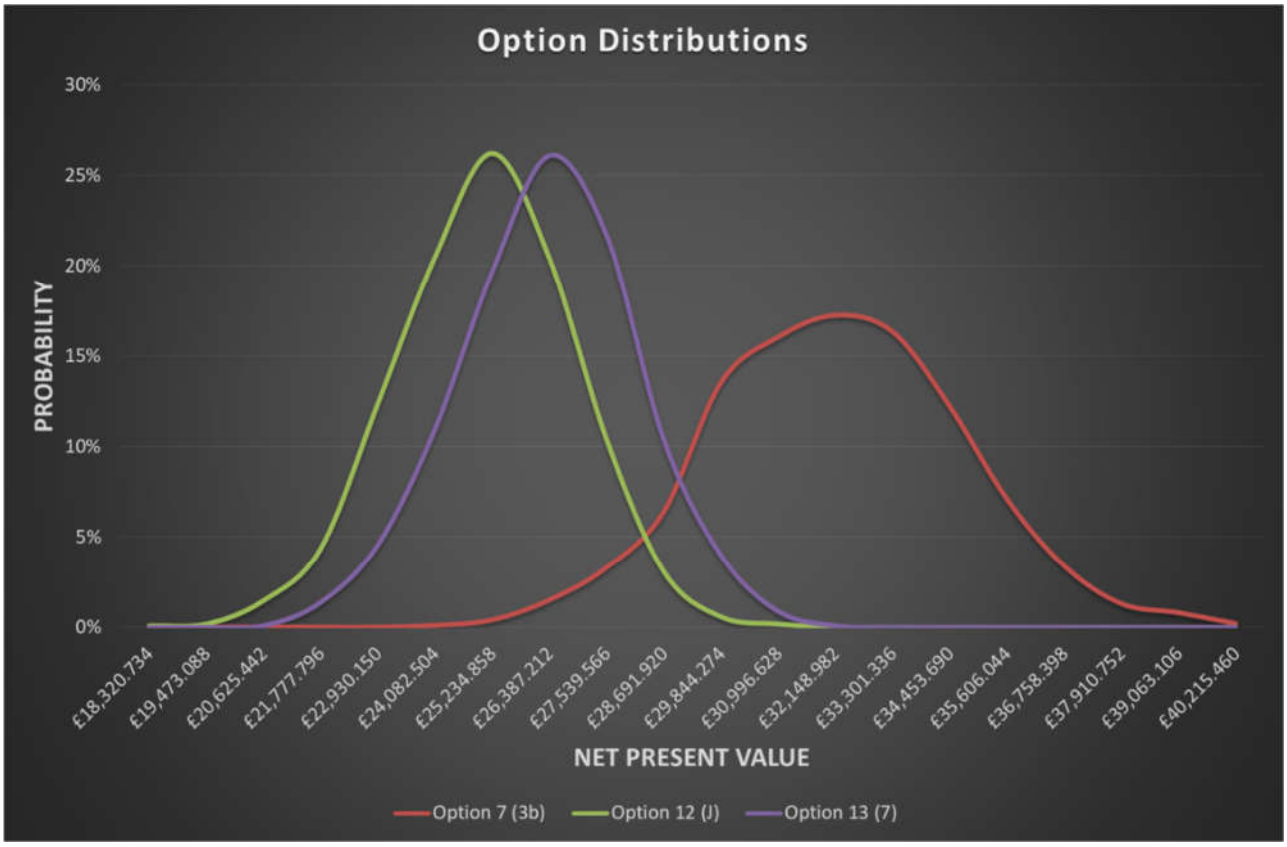


Table 3-26 Monte Carlo simulation: Option distributions



The probability of any value occurring within this distribution can be read off the chart. Both charts clearly indicate that option 12 (green line) is the least expensive option of those displayed while option 7 (red line) is the most expensive option. What is also clear is that there is overlap across options 12 and 13 probability distributions, suggesting that small change in adverse or favourable conditions for any of the options could affect the result.

The results indicate that there is:

A 4.1% probability that option 7 (3b) will cost between £22.5m and £27.5m

A 83.2% probability that option 12 (J) will cost between £22.5m and £27.5m

A 81% probability that option 13 (7) will cost between £22.5m and £27.5m

Furthermore (ceteris paribus):

If option 12(J) had increased capital build costs of 14% option 13(7) would become the most economically favourable;

If option 13 (7) capital costs were actually 11% less, it would displace option 12 (J) as the most economically favourable.

If option 13 (7) had the same level of optimism bias and risk as option 12 (J) it would become the most economically favourable.

The Monte Carlo analysis demonstrates that the choice of the preferred option 12(J) is robust within the reasonable bounds of certainty.

4. The Commercial Case

4.1. Introduction

This section provides details on the commercial structure and the procurement approach for the project.

4.2. Required services

The scope of work for the project and the associated outputs, have been specified and are contained within Section 2.8 of the Strategic Case.

The project will require a full range of civil engineering consultancy professional expertise together with that of experienced planning and project management. The construction will require the services of an experience civil engineering contractor.

The specific details include:

- Quantity surveying support – to provide iterative cost plans;
- Civil and structural engineering design support – to assist the project team in their final choice of road design, coastal adaptations and provide services as defined by the ACE schedule of services;
- Environmental, ecology, archaeological and landscape architecture specialist design support– to assist the project team assess the impacts to the environment and to carry out the Environmental Impact Assessments;
- Environmental consultancy to carry out the Sustainability Appraisal;
- Engineering consultancy to carry out the preliminary Flood Consequence Assessment;
- Planners to carry out public consultation and planning applications – to assist the project team in their final choice of road design and coastal adaptations;
- Construction support – to build the new road and coastal adaptations, in line with the Council's preferred design;
- Business Assurance support – to develop and validate a business case for the new project;
- Topographical, Ecological and Ground Investigation Survey support – to ensure that the preferred route and coastal adaption project locations are suitable for the scheme. These will include geotechnical; ecological, topographical and archaeological surveyors.

All of these services will be procured through the existing Council frameworks – in this case through the SWMWREC framework for engineering consultancy or the SWWRCECF framework for contractors.

4.3. Potential for risk transfer

Table 4-1 Potential for risk transfer

Risk Category	Potential allocation		
	Public	Private	Shared
Design risk		✓	
Construction and development risk		✓	
Transition and implementation risk			✓
Availability and performance risk		✓	
Operating risk	✓		

Risk Category	Potential allocation		
	Public	Private	Shared
Variability of revenue risks	✓		
Termination risks		✓	
Technology and obsolescence risks	✓		
Control risks	✓		
Residual value risks	✓		
Financing risks	✓		
Legislative risks			✓
Other project risks			✓

4.4. Proposed charging mechanisms

The proposed charging mechanism for construction contractors will be through the use of NEC3 Engineering and Construction Contract Option C, Target Contract with Activity Schedule. This means that any efficiencies made through improvements in design or buildability will be made as value engineering savings and the cost savings will be shared between the Employer and the Contractor.

The design consultants contract will be through NEC3 Professional Services Contract, Options A or E, **p**riced contract with activity schedule or time-based contract, respectively. This will allow fees to be agreed for various stages of work e.g. outline design, detail design stages and any support needed for the supervision and management of the works.

Both the consultant and contractor contracts require cost assessments to be made at (typically) monthly intervals, which are certified for payment by the Project Manager (a defined role in the NEC contract). Invoices are subsequently raised on against the value in the approved assessment.

4.5. Proposed contract lengths

The timescales for project will be dependant of the availability of the funding. The implementation timescales in the table below Imply that construction works will be completed in approximately 24 months from appointment of a successful framework contractor.

Table 4-2 Proposed contract timetable

Event	Dates
Develop and issue consultants scope for outline design – mini competition	October 2018
Consultants contract awarded for outline design	November 2018
Work-packages for ground, ecological and archaeological investigations tendered.	December 2018
Investigation work-packages awarded	January 2019
Outline design and investigation process completes	December 2019
Public Consultation on the Preferred Option	March 2020
Develop and issue consultants scope for detail design – mini competition	July 2020
Consultants contract awarded for detail design	September 2020
Design process completed	June 2022
Planning Application (PCNPA)	July 2021 – June 2022
Planning Inquiry Process completes	July 2022
FBC (Final Business Case) submission	June 2022
Consents (NRW)	January 2022
Develop and issue contractors' tender documents	September 2022
Construction contract awarded	February 2023
Contractor commences onsite	April 2023
Road opens	April 2025
Coastal adaptations complete	April 2025
Existing A487 coast road anticipated to be lost	January 2036
Commence Phase 2 Coastal Adaptations	April 2036
Complete scheme	April 2038

4.6. Proposed key contractual clauses

The key contractual issues, such as contract change control arrangements; remedies for breach of contract and general contract management (including management of disputes and agreements) are included within the standard form of contract (NEC3) with the chosen option.

4.7. Personnel implications

There are no anticipated personnel implications anticipated with this project. Resource is sourced entirely externally and it is not anticipated that staff transfers through TUPE arrangements would be required.

There is a risk of key personnel needing to be replaced during the life of the project, particularly one which spans over the timescale anticipated. This will be dealt with by the council's change management procedures in the client

organisation and also processes put in place for hand-over of key project information. Similar requirements will need to be put in place in both the contractor and consultant's organisations and this can form a contractual requirement.

4.8. Procurement strategy and implementation timescales

The decision concerning which procedure to use is a critical and a strategic one affecting the whole procurement process.

Two procurement strategy routes are considered here that include the following:

- Conventional procurement routes utilising framework consultants and contractors;
- Design and build to carry out all aspect of design through to construction within a single company/consortium.

The Council has good experience of working with contractor and consultant frameworks and has achieved positive outcomes using the current Carmarthenshire led frameworks for:

- South West Wales Regional Civil Engineering Contractors Framework (SWWRCECF) framework arrangement which ends in 2018 in partnership with Pembrokeshire, Neath Port Talbot and City and County of Swansea, and
- South West and Mid Wales Regional Engineering Consultants Framework (SWMWREC) framework arrangement which ends in 2020 in partnership with Pembrokeshire, Neath Port Talbot and City, Ceredigion, Powys and City and County of Swansea.

The Council has therefore concluded that the optimum procurement route will be to procure using the successor to the SWWRCECF/SWMWREC frameworks. Mirroring the approach taken on the consultancy framework, the successor contractor framework is likely to add the mid-Wales councils of Ceredigion and Powys.

The framework contracts result from collaboration between regional authorities to provide an efficient system of appointing contractors and consultants that reduces extensive contract procedures each time contracts for similar works are issued externally.

The framework enables advertising and pre-qualification to be completed once rather than several times for each authority. For smaller contracts, where appropriate, it enables direct appointment of contractors on a submitted 'schedule of rates' basis without further competition. Otherwise, contracts will be awarded following a mini competition process between successful framework contractors.

There is no obligation to use the framework for appointment of contractors and consultants. However, there is an understanding between the participating councils that the framework will be used for appropriate contracts. The process meets the competition requirements for grant funded schemes and is fully EU compliant.

4.8.1. The Contractor Appointment Process

The SWWRCECF framework is divided into 'lots' in accordance with work type and location. The Framework was advertised on the Welsh Government's 'Sell2Wales' web site in accordance with regulations. From the responses contractors were invited to submit pre-qualification documents.

An evaluation panel was established with senior officers from each of the participating Councils. Following the pre-qualification evaluation short-listed contractors were invited to prepare tenders in each of the relevant 'lots'.

On return of tenders the evaluation panel reconvened to assess the submissions. The assessment process is based on a cost/quality process in proportions agreed for each 'lot'. Contractors were informed of the assessment method as part of the tender process.

Cost was assessed in accordance with rates returned for typical contracts. Scores were determined relative to average total tendered cost from each contractor; points were awarded depending on the variation of the total cost from the mean. Quality was assessed based on factors including resource management, management structure and capability, health and safety, collaborative framework management and method statements for various typical schemes.

For large schemes, of cost greater than £7.5m, the Council propose to use Lot 7 of the SWWRCECF framework.

The benefits of utilising contractors from this existing Contractor Frameworks list are as follows:

1. The utilisation of contractors from a Local Authority Contractor Framework will result in significant time and procurement cost savings by avoiding the necessity to go through the OJEU process.

2. The original SWWRCECF framework expired in March 2014 and the successor has been active since January 2015, thereby providing a tried and tested procurement route. The successor framework will bring forward any lessons learned and further improvements to the framework.

For the framework, the Authorities commission works independently of each other although there will be joint initiatives in relation to delivery and recording of performance and the introduction of Community Benefits. Authorities will determine the appropriate delivery model for each call off contract and it is anticipated that there may be a number of delivery models in being.

All Framework Contractors will be expected to actively participate in the potential for economic, social and environmental wellbeing and regeneration which results from this arrangement. A number of specific aspects will be expected to be introduced during the period of the Framework Agreement including:

- Training and Employment Opportunities
- Supply Chain Opportunities
- Additional Sustainable Benefits

The contractual obligations are detailed in the Framework Agreement and will be relevant to each specific contract (or groups of contracts) and where appropriate the Welsh Government Community Benefits Management Toolkit will be utilised.

Mini Competitions
Within the framework there is a mini-competition to award the contract.

Any contractors who are invited to bid are expected to submit at tender, which will be assessed on the most economically advantageous basis. If the Contractor wishes to respond to such a call for mini competition it shall comply with the timescales and requirements set out in the call for mini competition.

If the Employer issues a call for mini competition and decides to award a contract as a result of such mini competition such Contractor shall enter into a contract in respect of such works with the Employer as set out in the relevant form of contract, NEC3 Option A, B or D as appropriate.

4.8.2. The Consultant Appointment Process

The SWMWREC consultant's framework does not use 'lots' as the contractors' framework. Any consultant is able to work in any location for a range of fees. The Framework was advertised on the Welsh Government's 'Sell2Wales' web site in accordance with regulations. From the responses consultants were invited to submit pre-qualification documents.

The framework is set up to allow consultants to provide engineering consultancy services for the delivery of civil engineering related construction projects. Five consultants have been appointed to supplement in-house design teams in the delivery of engineering consultancy services across the regions.

The aim of the South West and Mid Wales Regional Engineering Consultancy Framework is to provide high quality construction related design services to meet each Authorities' requirements whilst taking account of the principles of the 'Best Value' process and of 'Re-thinking Construction' and the requirements of the Wellbeing of Future Generations Act;

The objectives are as follows-

- To provide and sustain an open, co-operative and business-like culture between the parties;
- To integrate public and private sector skills in delivering services;
- To have access to additional resources and expertise;
- To retain and promote core in-house skills;
- To promote continuous improvement;
- To create development opportunities for employees of both private and public sectors;
- To deliver quantifiable community benefits.

Scope
The Employer has appointed five consultants to carry out services within the defined scope. The consultants selected for the framework are required to deliver a high-quality service in the fields of highways, structures and transportation engineering to include project management, technical advice, design, technical surveys, construction management and management of services. Areas of expertise are listed below, and a selection of these skills may be brought together to suit the needs of any particular project.

Scope of the Services for the South West & Mid Wales Regional Engineering Consultancy Framework
All civil, structural and highway engineering services, including but not limited to the following:

Engineering Design

- Bridge & Culvert design
- Design of Earth Retaining Structures
- Structural Inspection, Assessment and Repair
- Contract Preparation
- Project Management and Administration
- Highway Management and Maintenance
- Highway Design
- Specialist Highway Inspection
- Dangerous structures inspections and recommendations
- Highway Planning
- Environmental & Ecological Assessments
- Feasibility and Cost Studies
- Detailed Design
- Design Checks
- Street Lighting
- Soft and Hard Urban landscaping
- Management Planning
- Asset Management
- Geotechnical Engineering/Geotechnical surveys/Ground investigation
- Construction Design and Management Regulations (CDM)
- Environmental Improvements
- Land/foul water drainage
- Coastal Protection
- Flood Alleviation Studies and associated design
- General Infrastructure design
- Property related structural advice / design
- Technical Audit
- Topographic Surveys

Traffic and Transportation

- Accident Investigation and prevention
- Traffic management
- Public transport and traffic modelling
- Traffic management schemes
- Traffic impact assessments
- Traffic surveys and studies
- Cost benefit and economic assessment
- Traffic signal design and implementation
- Traffic implications of planned developments
- Strategy and policy advice

Statutory Procedures & Safety

- Expert advice and support for public inquiries, exhibitions and consultations
- Preparation of legal orders / statutory procedures
- Road Safety Audits
- Principal Designer Duties

Site Supervision and Quantity Surveying

- NEC Project Management & Supervision of Construction Works
- Site investigation and appraisal
- Construction advice
- Measurement of the works
- Interim Valuations and Financial Control
- Claims/compensation events assessments
- Dispute resolution

- Final Account Agreement
- Arbitration, Adjudication and Litigation
- Defined Cost Auditing & Cost Reporting

The above list is indicative only to provide an in-depth view into the diversity of professional services that are required within the term of the South West & Mid Wales Engineering Consultancy Framework. The range of services procured through the Contract may be developed and expanded in consultation with the consultants to suit particular areas of expertise available from both parties to the contract.

The Scope of the services will be defined in the Services Brief. The Consultant will be required to perform services such as Principal Designer, Designer, Design Leader, Lead Consultant and Project Manager (under the NEC3) during the pre-construction and construction Work Stages as well as site supervisory functions. Where the Employer deems it appropriate reference will be made to the Schedule of Services – Part G(d) within the ACE Agreement ACE Agreement 1 (2009) – Revised October 2011. Typical Services and stages that could be used are listed below. This list is not exhaustive and is only provided to give an indication of the work stages.

Feasibility	G2.1	Appraisal
	G2.2	Strategic Briefing
	G2.3	Outline Proposals
Pre-Construction	G2.4	Detailed Proposals
	G2.5	Final Proposals
	G2.6	Production Information
	G2.7	Tender Documentation and Tender Action
Construction	G2.8	Mobilisation, Construction and Completion
General	G3	Other Services by the Consultant e.g. Safety Auditors, duties of Principal Designers
	G4	Other Services by Others

Mini Competitions

Within the framework there is a mechanism either for direct award or mini-competition to award the contract. Council orders are in place that required any services exceeding £50,000 of fee are let by mini-competition.

Any consultants who are invited to bid are expected to submit at tender, which will be assessed on the most economically advantageous basis. If the consultant wishes to respond to such a call for mini competition it shall comply with the timescales and requirements set out in the call for mini competition.

If the Employer issues a call for mini competition and decides to award a services contract as a result of such mini competition such Consultant shall enter into a contract in respect of such works with the Employer as set out in the relevant form of contract, NEC3 Option A or E as appropriate.

4.9. IFRS 13 accountancy treatment

The assets underpinning the delivery of the service will be on the balance sheet of Pembrokeshire County Council. Construction of the Highway will be held at depreciated historic cost per the code in line with IFRS13. The cost of construction will be recognised in the year that expenditure is incurred and will be added to the infrastructure asset.

5. The Financial Case

5.1. Introduction

The purpose of this section is to set out the indicative financial implications of the preferred option (Option 12, previously Option J, as set out in the economic case section) and the proposed deal (as described in the commercial case section).

5.2. Breakdown of the capital costs for the preferred option

Table 5-1 Summary of capital costs

The costs over the life span of the project are shown below:

Project Costs and Welsh Government Contribution (£000)	
Capital Cost (including Coastal Adaptations and Capital LCC elements)	£14,438
Optimism Bias	£3,433
Risk	£2,810
Purchase of Land and Property	£631
VAT (only to be included where non-recoverable by applicant)	£0
Total Project Cost (inclusive of optimism bias and risk)	£21,312
Welsh Government Contribution (It is assumed that optimism bias and risk will be fully mitigated, or at a maximum of 2% of cost (for optimism bias) and 5% of cost (for risk) by FBC stage.	£15,984
Welsh Government Contribution based upon current coastal risk management grant support rate.	75%

5.3. Impact on the organisation's income and expenditure account

The anticipated payment stream for the project over its intended life span is set out in the following table and is utilised for the income and expenditure account in Table 5-3 and Table 5-4.

Table 5-2 Summary of financial appraisal

Cost Template Option 12 (previously Option J)

Highways Only

Option 12 Activity (£000) New Highway	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Scoping for ecological surveys							
Review Phase 1 habitat survey	£8k						
Scoping for detailed ecological surveys	£11k						
Produce briefs for GI work and procure contractor	£11k						
Baseline site surveys							
Initial ground investigation survey	£50k	£20k					
Archaeological surveys	£9k						
Ecological survey work (March - Sept season)		£80k					
Topographical	£25k						
Noise quality	£10k						
Air quality	£10k						
Interpretation of surveys	£8k	£20k					
Geotechnical report on ground conditions		£12k					
Professional Fees - Outline Design							
Refine road alignments, junctions		£50k					
Structures design		£30k					
Geotechnical design		£25k					
Earthworks		£20k					
Drainage		£15k					
Preliminary Flood Consequence Assessment (FCA)		£15k					
Flood mitigation		£15k					
Conceptual design of Coastal Adaptations		£10k					
Landscape architecture		£20k					
Visualisations		£40k					

Option 12 Activity (£000) New Highway	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Project management		£25k					
Assessments							
Update Outline Business Case (OBC)		£30k					
Sustainability Appraisal (SA)		£60k					
Public Consultation on preferred option		£55k					
Detail Design							
Professional Fees - detail design			£240k	£650k	£240k		
Follow up ground investigation			£90k				
Follow up ecology surveys			£100k				
Consents, Approvals							
Flood Consequence Assessment (FCA)				£40k			
Planning, EIA					£150k		
Full Business Case (FBC)					£75k		
Construction							
Demolition and Site Clearance						£202k	
Drainage						£324k	£324k
Earthworks						£1,784	£1,338k
Pavements							£1,956
Structures						£40k	
Misc. Roadworks						£146k	£438k
Contractors Preliminaries (20%)						£499.2k	£811.2k
Payments to Statutory Undertakers (5%)						£124.8k	£202.8k
Total Construction (Highway)	£142k	£542k	£430k	£690k	£465k	£3,120k	£5,070k

Coastal Adaptations only

Option 12 Activity (£000) Coastal adaptations	2024/25		2036/37	2037/38	2038/39
Phase 1					
Car park raising (village)	£89k				
Car park raising (south car park)	£321k				
Laybys & viewing points	£115k				
Access improvements across valley	£300k				
Access improvements between beach/village and valley	£300k				
Phase 1 habitat creation	£300k				
Contractors Preliminaries (20%)	£285k				
Future Phase					
Decommissioning of existing road and reinstate land			£229k		
Remove Brandy Brook Bridge			£150k		
Phase 2 habitat creation				£150k	£150k
Contractors Preliminaries (20%)			£76k	£30k	£30k
Total Adaptations	£1,710k		£455k	£180k	£180k

5.4. Impact on the Organisation's income and expenditure account

The impact on the income and expenditure account and cost build up for the preferred Option 12 (formerly J) is shown in the tables below, which shows the capital and revenue costs for the project for the first 8 years in order to capture the main capital expenses. The full 60 year costs are shown in Appendix A.4.

Table 5-3 Impact on the income and expenditure account

£'000s	Total Cost	Years (Only years 0 - 8 shown, to capture main capital expenses)								
		0	1	2	3	4	5	6	7	8
		18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
Preferred way forward:										
Total Capital (inc. Land purchase, construction, coastal adaptation and LCC elements)	14,438	£142	£542	£430	£690	£1,116	£3,120	£6,780	£0	£0
Total Revenue	2,190	£43	£43	£43	£43	£43	£43	£43	£45	£38
Total	16,628	£185	£585	£473	£733	£1,159	£3,163	£6,823	£45	£38
Funded by:										
Existing Revenue	-1,440	-£24	-£24	-£24	-£24	-£24	-£24	-£24	-£24	-£24
Cash Releasing Benefits	-20	£0	£0	£0	£0	£0	£0	£0	-£20	£0
Total Existing	-1,460	-£24	-£24	-£24	-£24	-£24	-£24	-£24	-£44	-£24
Additional Funding Required	15,168	£161	£561	£449	£709	£1,135	£3,139	£6,799	£1	£14
Cumulative Funding		£161	£722	£1,171	£1,880	£3,015	£6,154	£12,953	£12,954	£12,968

Table 5-4 Cost build-up for income and expenditure account

(Refer to Appendix A.4)

£'000s	NPC	Total Cost	Years (Only years 0 - 8 shown, to capture main capital expenses)								
			0	1	2	3	4	5	6	7	8
			18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
OPPORTUNITY COST											
Opening Value	£6,243	£6,243	£6,243	£0	£0	£0	£0	£0	£0	£0	£0
Opportunity Cost Total	£6,243	£6,243	£6,243	£0	£0	£0	£0	£0	£0	£0	£0
CAPITAL COSTS											
Construction Capital	£8,846	£10,459	£142	£542	£430	£690	£465	£3,120	£5,070	£0	£0
Coastal adaptations	£1,820	£2,525	£0	£0	£0	£0	£0	£0	£1,710	£0	£0
Lifecycle Capital	£403	£1,454	£0	£0	£0	£0	£0	£0	£0	£0	£0
Capital Cost Total	£11,069	£14,438	£142	£542	£430	£690	£465	£3,120	£6,780	£0	£0
REVENUE COST											
Revenue Costs	£726	£1,486	£24	£24	£24	£24	£24	£24	£24	£26	£26
Lifecycle Revenue	£341	£704	£19	£19	£19	£19	£19	£19	£19	£19	£12
Revenue Cost Total	£1,067	£2,190	£43	£43	£43	£43	£43	£43	£43	£45	£38
RISK RETAINED											
Project Risks	£2,459	£2,810	£74	£380	£426	£0	£190	£1,361	£379	£0	£0
Optimism Bias	£3,188	£3,433	£1,607	£320	£12	£34	£55	£1,377	£28	£0	£0
Risk Retained Total	£5,647	£6,243	£1,681	£700	£438	£34	£245	£2,738	£407	£0	£0
TOTAL COST	£24,026	£29,114	£8,109	£1,285	£911	£767	£753	£5,901	£7,230	£45	£38
BENEFITS											
Land Purchase/Capital Receipts	£552	£631	£0	£0	£0	£0	£651	£0	£0	-£20	£0
Benefits Totals	£552	£631	£0	£0	£0	£0	£651	£0	£0	-£20	£0
TOTAL	£24,578	£29,745	£8,109	£1,285	£911	£767	£1,404	£5,901	£7,230	£25	£38
CUMULATIVE TOTAL			£8,109	£9,394	£10,305	£11,072	£12,476	£18,377	£25,607	£25,632	£25,670

5.5. Overall affordability

Funding is required at £21.312m over 60 years (capital costs, project risks, optimism bias and land purchases), with £19.043m including capital costs (£12,169), project risks (£2,810), optimism bias (£3,188) and land purchases (£631) (but excluding VAT) which is due by year 8 of the scheme (2026/27 financial year).

The Council will meet the 25% contribution required to support this scheme, with the remainder to be met by Welsh Government should the funding mechanism be based upon current coastal flood risk management grant support.

Further funding anticipated to occur after 2036 will be required to carry out the coastal adaptions required when the existing A487 road is eventually lost to erosion.

6. The Management Case

6.1. Introduction

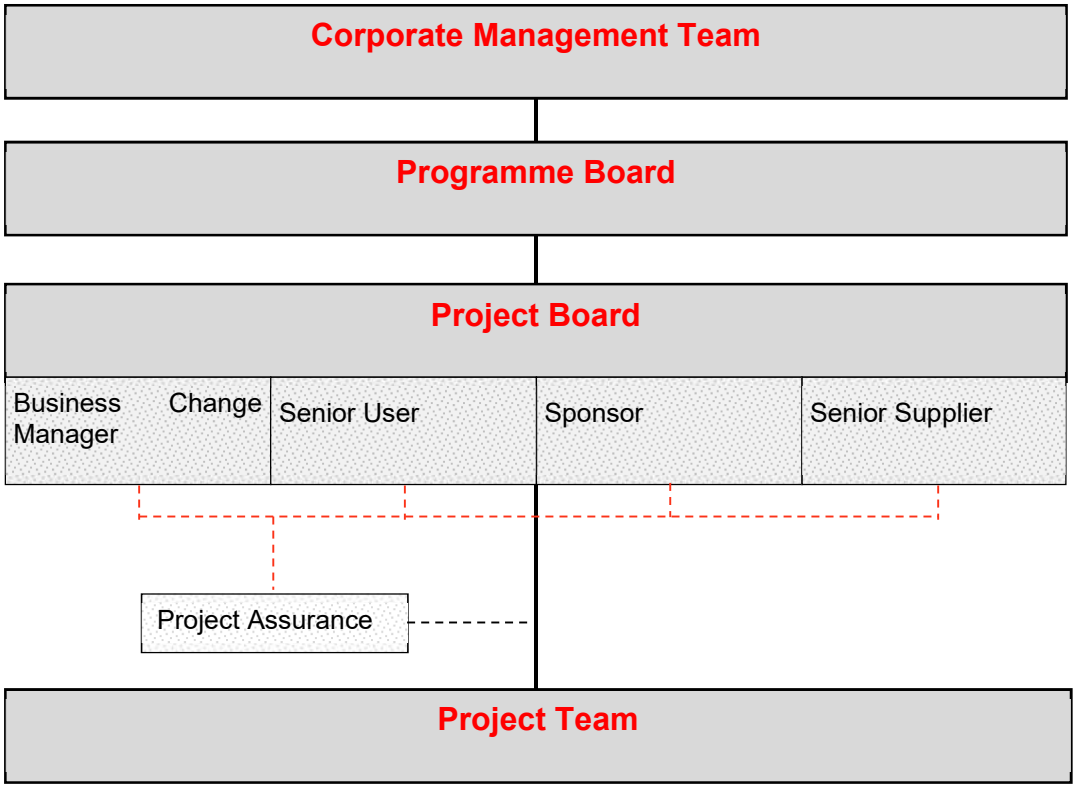
This section sets out the programme and project management arrangements for the preferred Option 12 (J).

6.2. Programme Management Arrangements

The Council has adopted a programme management governance model that is underpinned by MSP principles.

The project structure described below has been designed to ensure that the preferred option will have a robust project management function in place throughout the proposed timelines. This diagram demonstrates the lines of responsibilities and how the project will engage with the customer and supplier.

Figure 6-1 Programme management structure



The Programme board is structured as follows:

Table 6-1 Programme board

Name	Title	Programme Role
Jon Haswell	Director of Resources	Senior Responsible Officer
Darren Thomas	Head of Highways & Construction	Programme Manager
Emyr Williams	Coastal Engineer	Project Manager

6.3. Project Management Arrangements

6.3.1. Project Structure

The project will be managed in accordance with the general principles of PRINCE2 methodology. The project management team comprises the Project Board, “Project Team”, the Project Manager and the Team Managers. This “team” is responsible for the day-to-day management and implementation of the project.

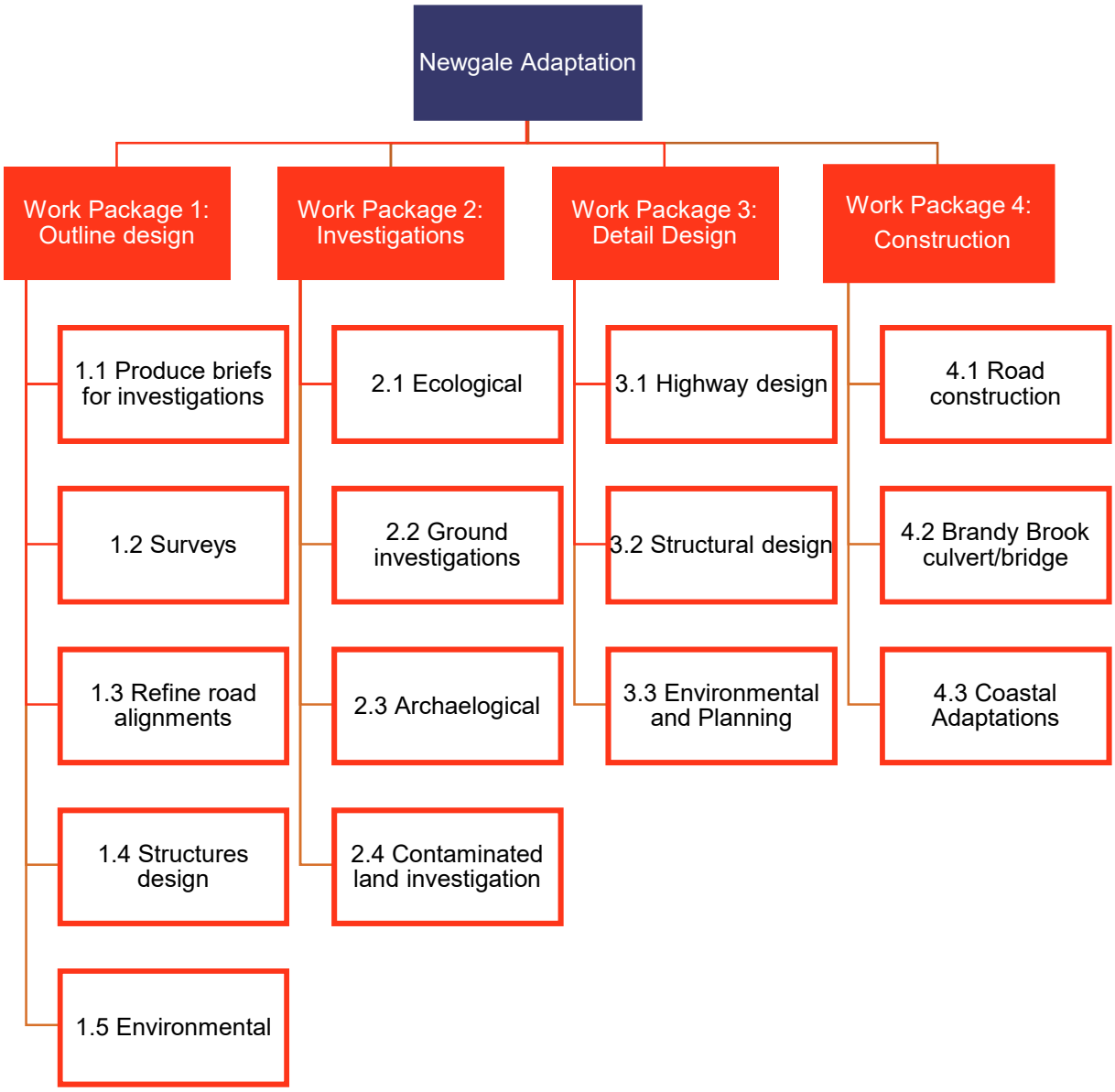
Table 6-2 Project management team

Name	Title	Project Role
Darren Thomas	Head of Highways & Construction	Programme Manager
Emyr Williams	Coastal Engineer	Project Manager

6.3.2. Project deliverables

The following project breakdown structure depicts the structure of the project:

Figure 6-2 Project breakdown structure



6.4. Project Plan

The following is the timetable relating to the actions required to ensure the project will be delivered and be operational within the desired timeframe.

Table 6-3 Project timetable

Date	Actions (commencement)
September 2018	Submit SOC/OBC
October 2018	Develop and issue consultants scope for outline design – mini competition
November 2018	Consultants contract awarded for outline design
December 2018	Work-packages for ground, ecological and archaeological investigations tendered.
January 2019	Investigation work-packages awarded
March 2020	Public Consultation on the Preferred Option
July 2020	Develop and issue consultants scope for detail design – mini competition
September 2020	Consultants contract awarded for detail design
July 2021	Planning Application (PCNPA)
June 2022	FBC (Final Business Case) submission
January 2022	Consents (NRW)
September 2022	Develop and issue contractors' tender documents
February 2023	Construction contract awarded
April 2023	Contractor commences onsite
April 2025	Road opens
April 2025	Coastal adaptations complete
January 2036	Existing A487 coast road anticipated to be lost
April 2036	Commence Phase 2 Coastal Adaptations
April 2038	Complete scheme

6.5. Benefits Realisation

The strategy, framework and plan for dealing with the management and delivery of benefits are shown below. Benefits that will be realised may be either financial or qualitative (for example improvement in educational standards).

The plan for benefits will be integrated into or coordinated with the project plan and will be very clear regarding handover and responsibilities for on-going operations in the changed state (where the benefits will actually accrue). There will be a Tracking Process, which monitors achievement of benefits against expectations and targets. The tracking process will be capable of tracking both 'hard' (e.g. cost, headcount) and 'soft' (e.g. image) benefits and operates alongside the changing operation. The progress of this plan will be reported by the Project Manager to the Project Board.

In particular the Benefits Management Strategy will be fully integrated into the programme plan and will fully address the following issues:

- That the potential benefits are clearly identified;
- That the benefits are clearly understood across the project and the various Project Teams. It is the role of the Project Manager to ensure that this is achieved;
- That benefits are placed into manageable groups.

6.6. Risk Management

In developing the economic case, a risk assessment was completed, to understand the risks associated with each of the short-listed options and to analyse the financial value of those risks.

All projects have an element of risk and there must be a proactive approach to risk management to balance risks against the potential rewards and plan to minimise or avoid them. It is also acknowledged that taking some amount of risk will be inevitable to the success of the project. The strategy, framework and plan for dealing with the management of risk for the preferred option follows a PRINCE2 (or APM) methodology.

The register will be a 'living document' and reviewed and amended (where required) during workshops where a risk manager will be appointed to manage the identification, monitoring, updating, control and mitigation of project risks. The framework and plan of the risk register will involve a rated table format. The risk will be described and the date of its identification noted. An initial risk rating will be made and the probability and impact of the risk evaluated, followed by a residual risk rating column. The effects and impact of risk can involve elements such as environment, time, quality, cost, resource, function or safety and regular meetings will be held to review all aspects. Within the format there will also be the facility for proposals to mitigate and manage, identifying the control strategy, risk owner and the current risk status.

The total risk score for each risk will be calculated by multiplying the likelihood score (between 1-5 with 5 being certain) and impact score (between 1-10 with 10 being project failure) and all risks scoring above 21 referred to the Project Board for decision. The risk tolerance line for the project is illustrated in the following table.

Likelihood	1	2	3	4	5	6	7	8	9	10
5	5	10	15	20	25	30	35	40	45	50
4	4	8	12	16	20	24	28	32	36	40
3	3	6	9	12	15	18	21	24	27	30
2	2	4	6	8	10	12	14	16	18	20
1	1	2	3	4	5	6	7	8	9	10

Impact

6.7. Change and Contract Management

The main aim here is to manage proposed changes to the culture, systems, processes and people working to establish the best option for the council. Change management is not about the provision of the best option but instead focuses on those actions that are necessary to make the best option a working success.

Managers responsible for the key areas will adopt appropriate project management disciplines to meet specific responsibilities. The individual activities may be projects in their own right or be work streams within the overall project.

Planning has been developed for all activities within this change management process through the identification of key outcomes and actions required to ensure successful delivery. Timescales for carrying out such actions, the resources required, and where required, the need for additional resources, have also been determined.

6.8. Gateway Reviews

The Council confirm that it is prepared to complete a Gateway review of the programme at Welsh Government convenience. Further Gateway reviews may then be undertaken during the remaining life of the programme.

6.9. Post Project Evaluation

The outline arrangements for Post Implementation Review (PIR) and Project Evaluation Review (PER) have been established in accordance with best practice and are as follows.

6.9.1. Post Implementation Review (PIR)

These reviews ascertain whether the anticipated benefits have been delivered and are timed to take place a year post construction.

6.9.2. Project Evaluation Reviews (PERs)

PERs appraise how well the project was managed and delivered compared with expectations and are timed to take place one-year post construction.

6.10. Contingency Plans

In the event of project failure, the existing A487 through Newgale will continue to operate (business as usual) until such time as the coastal section of the road is lost through erosion (anticipated by 2036). The diversion route can also be used, although the traffic capacity of this alternative will be severely constrained, causing major disruption to traffic that uses the A487.

Appendix A. Economic and financial appraisal summary

Appendix B. Risk register

Appendix C. Economic value of the A487 via Newgale – base case

Appendix D. Ecosystems value of Newgale Adaptation

Appendix E. Adaptation Plan options

Appendix F. WelTAG report

Atkins Ltd
West Glamorgan House
12 Orchard Street
Swansea
SA1 5AD

+44 1792 641172