

# Technical Note

<b>Project:</b>	Newgale	<b>To:</b>
<b>Subject:</b>	Transport Economic Efficiency	<b>From:</b>
<b>Date:</b>	12 Jan 2017	<b>cc:</b>

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N.B. The text within this Technical Note will be inputted into a multi-discipline WelTAG assessment prior to issue to the client and will be subject to further change/review.

## 1. Transport Economic Efficiency

### 1.1. Introduction

This section describes the Transport Economic Efficiency (TEE) Assessments undertaken for the four route options. The outcomes of these assessments have been used to inform the TEE related inputs to the WelTAG AST Tables.

The TEE part of the WelTAG appraisal is designed to measure the impact of the proposals on the economic efficiency of the transport system. It requires analysis of the costs and benefits of the proposal under consideration and covers the impact areas ordinarily captured by standard cost-benefit analysis.

Utilising the forecasts presented within this section of the report and earlier analysis on transport safety, a high level assessment has also been undertaken as to the extent the four route options would meet the Scheme Transport Planning Objectives.

### 1.2. Methodology

The purpose of a Stage 1 WelTAG appraisal is to screen and test options, which were developed during the planning stage, against both the Scheme TPO's and the Welsh Impact Areas; Economy, Environment and Society.

The appraisal of transport schemes, such as Newgale Beach Road, takes into account changes in the characteristics of travel as a result of the scheme. These include variations in journey times, journey distances and road safety between the 'without scheme' situation and the 'with scheme' position. The journey time and distance elements of the appraisal forms part of the Transport Economic Efficiency criteria in WelTAG (which falls within the Economy criteria of the Welsh Impact Areas), whilst safety forms part of both the Transport Economic Efficiency criteria and the Transport Safety criteria (which falls separately within the Social criteria of the Welsh Impact Areas). The Scheme Transport Safety assessment is reported earlier in this report.

#### 1.2.1. Transport Economic Efficiency

Using the traffic forecasts presented in the following section and adopting principles from the Department for Transport TUBA programme and WebTAG (in particular **Unit A1.1: Cost-Benefit Analysis**), all four route options have been ranked in terms of their likely Benefit to Cost Ratio (BCR). A BCR is calculated by dividing the Present Value of Benefits (PVB) by the Present Values of Costs (PVC). The PVB is calculated from changes in journey time, distances, carbon emissions and collisions whilst the PVC takes into account the cost of constructing, operating, maintaining and renewing the Scheme.

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## 1.3. Key Findings

### 1.3.1. Scheme Traffic Forecasts

Traffic related forecasts for Newgale and the surrounding road network have been produced using traffic survey data (ATC, MCC, Turning Count and Speed Survey data) obtained from PCC. Forecasts have been produced to represent conditions on an average weekday (18 hour AAWT) and average day (24 hour AADT) covering both the 'with scheme' (Do Something) and 'without scheme' (Do Minimum) scenarios.

#### 2022 Opening Year Forecasts (Do Minimum and Do Something 1)

For forecasting purposes it has been assumed that the A487 through Newgale will remain open until 2036 albeit that 'through traffic' will be directed along the new road (i.e the Scheme) in the 'with scheme' scenario.

#### 2037 Design Year Forecasts (Do Minimum and Do Something 2)

From 2037 onwards it has been assumed that the A487 will be severed at Newgale. Consequently, Welsh Road, Newgale Campsite and the Newsurf Café & Shop will be accessed from the southern stub of the A487 (Wood Hill). The remainder of Newgale (including the Duke of Edinburgh Inn, Toilets, Sands Café, Carter's Garden and Leisure Store and The Big Blue Experience) will be accessed from the northern stub of the A487 (Wood Hill).

'Through traffic' has been assigned to the C3062 (Roch Hill) and C3010 (Penycwm) route in the 'without scheme' scenario and to the new road (i.e the Scheme) in the 'with scheme' scenario.

#### 1.3.1.1. 2022 Opening Year

**Table 1-1** below presents the 2022 Opening Year Traffic Forecasts for the Do Minimum and Do Something 1 Scenarios. A study area Node-Link Diagram is provided in **Appendix X**.

**Table 1-1 2022 AADT Opening Year Traffic Forecasts**

Link No.	Link Description	Do Min	Option 3	Option 11	Option 7	Option J
1	A487 / Church Road Crossroads (Simpson Cross) to Option 11	5371	5371	5371	5371	5371
2	Option 11 to Option 7	4710	4710	1063	4710	4710
3	Option 7 to Option J	4710	4710	1063	1063	4710
4	Option J to New Welsh Road Link	4710	4710	1063	1063	1063
5	New Welsh Road Link to Option 3	4710	4574	1063	1063	1063
6	Option 3 to A487 / Welsh Road Junction	4710		1063	1063	1063
7	Southern Cluster Stub (Newgale Seafront)	4574		1205	1205	1205
8	Northern Cluster Stub (Newgale Seafront)	4574		1205	1205	1205
9	Option 3		4574			
10	Option 3 to A487 / Newgale Farm Junction	4604	4604	1234	1234	1234
11	A487 / Newgale Farm Junction to Option J	4604	4604	1234	1234	1234
12	Option J to Option 11	4604	4604	1234	1234	4604
13	Option 11 to Option 7	4494	4494	4494	1204	4494
14	Solva	4494	4494	4494	4494	4494
15	Penycwm to Treffgarne Junction – (Option 11)	534	534	3904	534	534
16	Treffgarne Junction to A487 / Roch	90	90	3460	90	90

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Link No.	Link Description	Do Min	Option 3	Option 11	Option 7	Option J
	Hill Junction (Option 11)					
17	Option 7				3370	
18	Option J					3370
19	Welsh Road	1376		1376	1376	1376
20	New Welsh Road Link		1376			

## 1.3.1.2. 2037 Design Year

**Table 1-2** below presents the 2037 Design Year Traffic Forecasts for the Do Minimum and Do Something 2 Scenarios.

**Table 1-2 2037 AADT Design Year Traffic Forecasts**

Link No.	Link Description	Do Min	Option 3	Option 11	Option 7	Option J
1	A487 / Church Road Crossroads (Simpson Cross) to Option 11	5934	5934	5934	5934	5934
2	Option 11 to Option 7	1711	5204	1711	5204	5204
3	Option 7 to Option J	1711	5204	1711	1711	5204
4	Option J to New Welsh Road Link	1711	5204	1711	1711	1711
5	New Welsh Road Link to Option 3	191	5204	191	191	191
6	Option 3 to A487 / Welsh Road Junction	191		191	191	191
7	Southern Cluster Stub (Newgale Seafront)	191		191	191	191
8	Northern Cluster Stub (Newgale Seafront)	826		826	826	826
9	Option 3		5054			
10	Option 3 to A487 / Newgale Farm Junction	826	5086	826	826	826
11	A487 / Newgale Farm Junction to Option J	826	5086	826	826	826
12	Option J to Option 11	826	5086	826	826	5087
13	Option 11 to Option 7	4965	4965	4965	1188	4965
14	Solva	4965	4965	4965	4965	4965
15	Penycwm to Treffgarne Junction – (Option 11)	5651	590	5651	590	590
16	Treffgarne Junction to A487 / Roch Hill Junction (Option 11)	5159	99	5159	99	99
17	Option 7				5060	
18	Option J					5060
19	Welsh Road					
20	New Welsh Road Link	1520	1520	1520	1520	1520

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## 1.3.2. Scheme Costs

A cost breakdown for the four route options is provided in Section x.x of this report. The total scheme costs, against which the benefits of the scheme are measured, are presented below (most expensive to least expensive);

- Option 11 – £28,505,291;
- Option 3 – £21,552,491;
- Option 7 – £20,767,935; and
- Option J – £15,902,259.

The above scheme costs have been calculated using a 2016 Q3 price base. However, in accordance with WebTAG guidance, the stream of costs and benefits forecast for the Scheme (over a 60 year appraisal period) have been discounted to 2010 prices / levels.

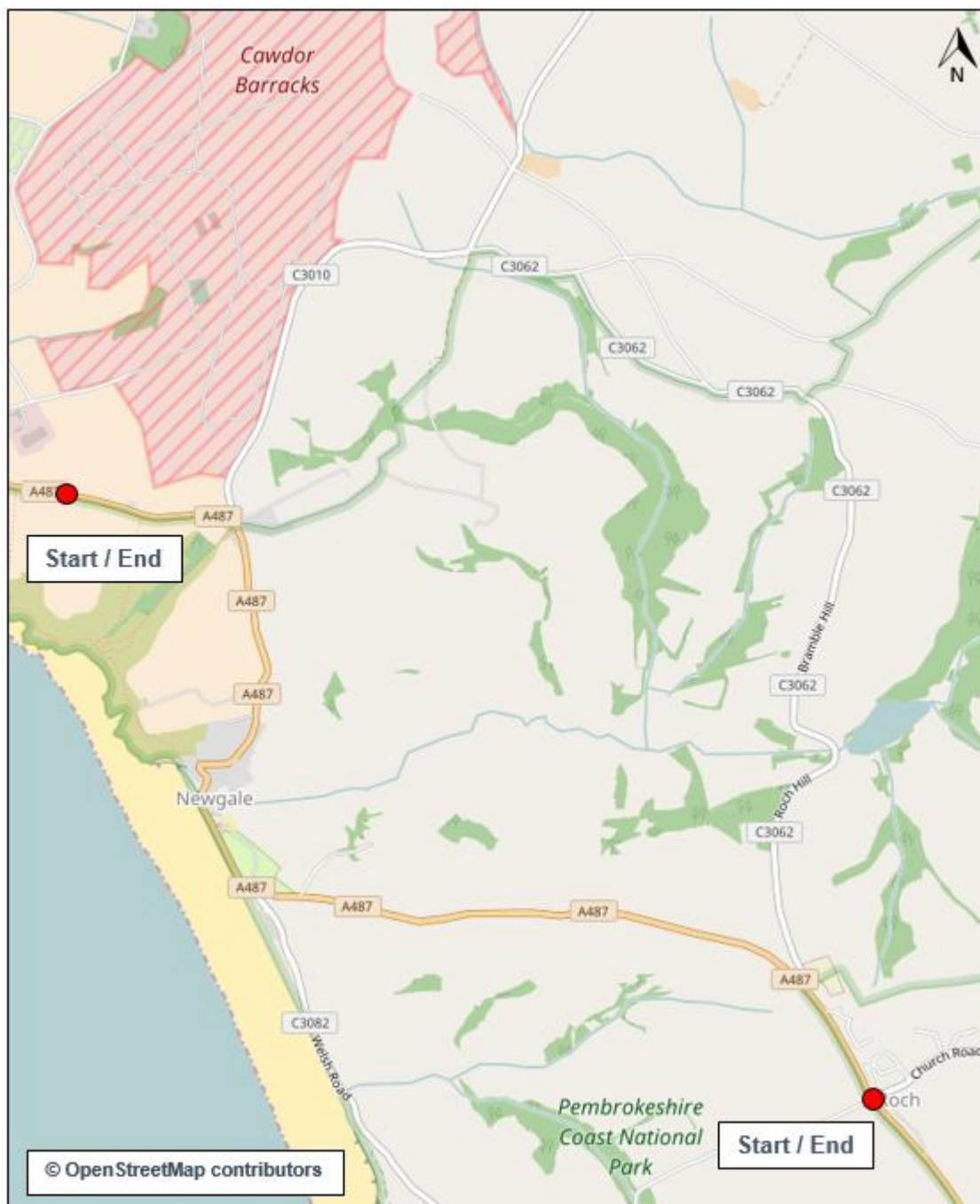
## 1.3.3. Scheme Benefits

### 1.3.3.1. Distance and Journey Times

All four options for the Newgale Scheme would provide an alternative route avoiding the shingle bank at Newgale. **Tables 1-3 to 1-6** below provide route length and journey time comparisons between the 'with scheme' and 'without scheme' scenarios. The comparisons are based on route distances and travel times for 'through traffic' travelling between the existing A487 Church Road Crossroads (Simpson Cross) in the south east and a point 0.5km west of the Option 7 tie in point in the north west (as illustrated in **Figure 1**).

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Figure 1. Route Comparison Measurement Points



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## 2022 Opening Year

**Table 1-3 Opening Year Route Length Comparison**

Option	Total Route Length (km)	Change (km)	Rank
Existing	5.322	-	
Option 3	5.326	+0.004	2
Option 11	7.431	+2.109	4
Option 7	5.159	-0.163	1
Option J	5.729	+0.407	3

Option 7 provides the greatest distance saving compared to the existing situation (a reduction in distance travelled of 163 metres). Option 3 shows a negligible increase of approximately 4 metres compared to the existing route, as it follows almost an identical alignment. The remaining two options provide no distance savings, with Option J and Option 11 constituting increases of 0.4km and 2.1 km's respectively.

**Table 1-4 Opening Year Journey Time Comparison**

Option	Total Route – Journey Time (secs)	Change (secs)	Rank
Existing	352	-	-
Option 3	340	-12	4
Option 11	299	-53	3
Option 7	228	-124	1
Option J	276	-76	2

Option 7 provides the shortest travel time of all route options under consideration; a reduction of 124 seconds compared to the existing route. Options J and 11 would also provide significant journey time savings of 76 seconds and 53 seconds respectively. Option 3 is shown to provide a negligible 12 seconds time saving.

## 2037 Design Year

As outlined earlier, from 2037 onwards it has been assumed that the A487 will be severed at Newgale requiring 'through traffic' to reassign to the C3062 (Roch Hill) and C3010 (Penycwm) without the Scheme in place. The 2037 Design Year route length and journey time comparisons have been undertaken on this basis. The comparison are provided in **Tables 1-5** and **1-6**.

**Table 1-5 Design Year Route Length Comparison**

Option	Total Route Length (km)	Change (km)	Rank
Do Minimum	7.431	-	
Option 3	5.326	-2.105	2
Option 11	7.431	+/- 0	4
Option 7	5.159	-2.272	1
Option J	5.729	-1.702	3

Option 7 is again shown to provide the greatest distance saving in the 2037 Design Year; a reduction of approximately 2.3km compared to the Do Minimum. Option 3 shows a similar reduction of approximately 2.1km, Option J a reduction of 1.7km whilst the distance of Option 11 is identical to the Do Minimum.

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**Table 1-6 Design Year Journey Time Comparison**

Option	Total Route – Journey Time (secs)	Change (secs)	Rank
Do Minimum	657	-	-
Option 3	340	-317	4
Option 11	299	-358	3
Option 7	228	-429	1
Option J	276	-381	2

Option 7 is again shown to provide the shortest travel time of all route options under consideration; a reduction of 429 seconds compared to the Do Minimum. Options J, 11 and 3 would also provide significant journey time savings of 381 seconds, 358 seconds and 317 seconds respectively.

## 1.3.4. Scheme BCR Estimates

As outlined earlier, this part of the WelTAG appraisal is designed to measure the impact of the proposals on the economic efficiency of the transport system. The costs and benefits of the proposals, outlined within this section of the report, have been quantified (in line with WebTAG guidance) and input to a spreadsheet model to provide high level BCR estimates for the four route options. The BCR results for each options is provided in **Table 1-7** below.

**Table 1-7 BCR Results**

Route	Total Discounted Scheme Costs (2010 Prices)	Discounted Scheme Benefits (2010 Prices)	BCR Estimate	Value for Money Category	Rank
Option J	£12.94	£39.2m	3.0	High	1
Option 7	£16.89	£42.6m	2.5	High	2
Option 3	£17.53	£34.5m	1.97	Medium	3
Option 11	£23.19	£35.2m	1.5	Medium	4

Whilst Option 7 is forecast to provide the greatest level of transport benefits out of all four options, Option J would provide the greatest value for money. Option J has a BCR of 3 and is categorised as providing 'High' Value for Money.