

Appendix 3 - SBCR Cost-Benefit Analysis: July 2018

Project Name Yr Egin

Version 1.6

Date 06/07/2018

Option (Base)	10Yr NPV	15Yr NPV
4 - Phase 1 and 2	84,893,075	150,022,312
3 - Phase 1 Only	52,123,109	79,897,813
2 - S4C Requirement Only	16,371,467	23,434,791
1 - Do Minimum	16,852,627	23,915,951

Sensitivity Analysis

10Yr NPV	15Yr NPV
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10Yr NPV	15Yr NPV
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20% reduction in Wider Benefit		
4 - Phase 1 and 2	84,893,075	150,022,312
3 - Phase 1 Only	52,123,109	79,897,813
2 - S4C Requirement Only	16,371,467	23,434,791
1 - Do Minimum	16,852,627	23,915,951

40% reduction in Benefits		
4 - Phase 1 and 2	42,217,234	81,294,776
3 - Phase 1 Only	26,096,430	42,761,253
2 - S4C Requirement Only	8,502,880	12,740,875
1 - Do Minimum	10,111,576	14,349,570

1Yr Delay in Benefits		
4 - Phase 1 and 2	71,640,230	137,112,912
3 - Phase 1 Only	45,923,776	74,679,074
2 - S4C Requirement Only	14,807,073	22,117,613
1 - Do Minimum	15,288,232	22,598,772

Slow Mobilisation (6month delay)		
4 - Phase 1 and 2	78,266,653	143,567,612
3 - Phase 1 Only	49,023,442	77,288,444
2 - S4C Requirement Only	15,589,270	22,776,202
1 - Do Minimum	16,070,429	23,257,362

20% increase in costs		
4 - Phase 1 and 2	80,533,770	145,663,006
3 - Phase 1 Only	49,534,391	77,309,096
2 - S4C Requirement Only	15,711,467	22,774,791
1 - Do Minimum	16,852,627	23,915,951

1Yr Delay and -20% Wider Benefit		
4 - Phase 1 and 2	71,640,230	137,112,912
3 - Phase 1 Only	45,923,776	74,679,074
2 - S4C Requirement Only	14,807,073	22,117,613
1 - Do Minimum	15,288,232	22,598,772

CBA (Simplified) Option 4 - Phase 1 and 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	15 Yr Total	10Yr 2026
	Project Period				Post-Project												
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031		
Costs																	
Public Sector Investment	8,868,348	3,000,000	3,470,000	5,331,653	-	-	-	-	-	-	-	-	-	-	-	20,670,000	20,670,000
Investment (discounted/bias factored)	9,755,182	3,188,406	3,563,210	5,289,730	-	-	-	-	-	-	-	-	-	-	-	21,796,528	21,796,528
Cumulative Costs (discounted/bias)	9,755,182	12,943,588	16,506,798	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528	21,796,528
Benefits																	
Cash-releasing benefits	138,371	2,835,875	40,662	12,889	1,666,623	183,127	210,069	223,675	221,675	219,533	82,535	215,361	213,221	211,044	208,717	6,160,240	5,394,432
Non-Cash-releasing Benefits																	
Construction Jobs Created	65	-	42	60												65	-
Construction Benefit	2,615,152		1,700,279	2,428,970												6,744,401	6,744,401
Technology Jobs Created																	
Theme Sector Benefit																	
Other Jobs Created	-	95	190	190	265	324	339	350	361	372	383	394	405	416	427	427	372
Other Jobs Benefit	-	4,177,359	8,354,719	8,354,719	12,245,250	15,357,675	16,135,781	16,704,766	17,273,751	17,842,735	18,411,720	18,980,704	19,549,689	20,118,674	20,687,658	214,195,200	116,446,755
Induced Wage Benefit (Multiplier)*																	
Total Benefits	2,476,781	7,013,234	10,014,336	10,796,578	13,911,873	15,540,802	16,345,850	16,928,441	17,495,425	18,062,268	18,329,184	19,196,065	19,762,910	20,329,718	20,896,375	227,099,841	128,585,588
Total Benefits (discounted)	2,476,781	6,776,071	9,348,490	9,737,895	12,123,394	13,084,938	13,297,359	13,305,601	13,286,228	13,252,846	12,993,904	13,148,263	13,078,764	12,998,906	12,909,400	171,818,840	106,689,604
Cumulative Benefits (discounted)	2,476,781	9,252,852	18,601,342	28,339,237	40,462,631	53,547,569	66,844,929	80,150,530	93,436,758	106,689,604	119,683,507	132,831,770	145,910,534	158,909,440	171,818,840	171,818,840	106,689,604
NPV	- 7,278,402	- 3,690,736	2,094,544	6,542,709	18,666,103	31,751,041	45,048,400	58,354,002	71,640,230	84,893,075	97,886,979	111,035,242	124,114,005	137,112,912	150,022,312	150,022,312	84,893,075

Base Analysis

Scenario Summary	
10Yr NPV	84,893,075
15Yr NPV	150,022,312

Sensitivity Analysis

20% reduction in Wider Benefit	
10Yr NPV	84,893,075
15Yr NPV	150,022,312

40% reduction in Benefits	
10Yr NPV	42,217,234
15Yr NPV	81,294,776

1Yr Delay in Benefits	
10Yr NPV	71,640,230
15Yr NPV	137,112,912

Slow Mobilisation (6month delay)	
10Yr NPV	78,266,653
15Yr NPV	143,567,612

20% increase in costs	
10Yr NPV	80,533,770
15Yr NPV	145,663,006

1Yr Delay and -20% Wider Benefit	
10Yr NPV	71,640,230
15Yr NPV	137,112,912

Optimism Bias

0.10

*The job estimates identified above are based on an assessment of the net additional impact at the City Region level. Therefore, they include allowance for displacement and multiplier effects

NB: Although S4C is a public sector organisation its advance rental payment of £3M in 2017 has not been included in Public Sector Investment above as it is a commercial occupancy arrangement and not an investment in the project per se. The grant of £348,000 received in 2017 from the Garfield Weston Foundation has been included within Public Sector Investment

CBA (Simplified) Option 3 - Phase 1 Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
	Project Period				Post-Project											15 Yr		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total	2026	
Costs																		
Public Sector Investment	8,868,348	3,000,000	-	-	-	-	-	-	-	-	-	-	-	-	-	11,868,348	11,868,348	
Investment (discounted/bias factored)	9,755,182	3,188,406	-	-	-	-	-	-	-	-	-	-	-	-	-	12,943,588	12,943,588	
Cumulative Costs (discounted/bias)	9,755,182	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	12,943,588	
Benefits																		
Cash-releasing benefits	-	138,371	2,835,875	40,662	12,889	32,991	51,095	79,669	94,939	94,637	94,335	205,966	93,732	93,430	93,128	92,826	3,284,547	3,117,398
Non-Cash-releasing benefits																		
Construction Jobs Created	65																65	-
Construction Benefit	2,615,152																2,615,152	2,615,152
Technology Jobs Created																		
Theme Sector Benefit																		
Other Jobs Created		95	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190
Other Jobs Benefit		4,177,359	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	8,354,719	112,788,703	71,015,109
Induced Wage Benefit (Multiplier)*																		
Total Benefits	2,476,781	7,013,234	8,314,057	8,367,608	8,387,710	8,405,814	8,434,387	8,449,658	8,449,356	8,449,054	8,148,752	8,448,450	8,448,148	8,447,847	8,447,545	118,688,402	76,747,660	
Total Benefits (discounted)	2,476,781	6,776,071	7,761,261	7,547,103	7,309,405	7,077,470	6,861,380	6,641,355	6,416,539	6,199,333	5,776,804	5,786,730	5,590,844	5,401,588	5,218,739	92,841,402	65,066,697	
Cumulative Benefits (discounted)	2,476,781	9,252,852	17,014,114	24,561,217	31,870,621	38,948,091	45,809,471	52,450,825	58,867,364	65,066,697	70,843,501	76,630,231	82,221,074	87,622,662	92,841,402	92,841,402	65,066,697	65,066,697
NPV	- 7,278,402	- 3,690,736	4,070,525	11,617,629	18,927,033	26,004,503	32,865,882	39,507,237	45,923,776	52,123,109	57,899,913	63,686,642	69,277,486	74,679,074	79,897,813	79,897,813	52,123,109	52,123,109

Base Analysis

Scenario Summary
10Yr NPV 52,123,109
15Yr NPV 79,897,813

Sensitivity Analysis

20% reduction in Wider Benefit
10Yr NPV 52,123,109
15Yr NPV 79,897,813

40% reduction in Benefits
10Yr NPV 26,096,430
15Yr NPV 42,761,253

1Yr Delay in Benefits
10Yr NPV 45,923,776
15Yr NPV 74,679,074

Slow Mobilisation (6month delay)
10Yr NPV 49,023,442
15Yr NPV 77,288,444

20% increase in costs
10Yr NPV 49,534,391
15Yr NPV 77,309,096

1Yr Delay and -20% Wider Benefit
10Yr NPV 45,923,776
15Yr NPV 74,679,074

Optimism Bias

0.10

*The job estimates identified above are based on an assessment of the net additional impact at the City Region level. Therefore, they include allowance for displacement and multiplier effects

NB: Although S4C is a public sector organisation its advance rental payment of £3M in 2017 has not been included in Public Sector Investment above as it is a commercial occupancy arrangement and not an investment in the project per se. The grant of £348,000 received in 2017 from the Garfield Weston Foundation has been included within Public Sector Investment

CBA (Simplified) Option 2 - S4C Requirement Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	15 Yr Total	10Yr 2026	
	Project Period 2017	2018	2019	2020	Post-Project 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031			
Costs																		
Public Sector Investment	3,000,000				-	-	-	-	-	-	-	-	-	-	-	-	3,000,000	3,000,000
Investment (discounted/bias factored)	3,300,000				-	-	-	-	-	-	-	-	-	-	-	-	3,300,000	3,300,000
Cumulative Costs (discounted/bias)	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000
Benefits																		
Cash-releasing benefits		3,000,000			-	-	-	-	-	-	-	-	-	-	-	-	3,000,000	3,000,000
Non-Cash-releasing benefits																		
Construction Jobs Created	14																14	
Construction Benefit	552,497																552,497	552,497
Technology Jobs Created																		
Theme Sector Benefit																		
Other Jobs Created		52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Other Jobs Benefit		2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	21,889,531	19,188,984
Induced Wage Benefit (Multiplier)*																		
Total Benefits	552,497	5,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	33,402,028	22,741,481	
Total Benefits (discounted)	552,497	4,958,560	1,990,347	1,923,040	1,858,010	1,795,179	1,734,472	1,675,819	1,619,148	1,564,395	1,511,492	1,460,379	1,410,994	1,363,280	1,317,178	26,734,791	19,671,467	
Cumulative Benefits (discounted)	552,497	5,511,057	7,501,404	9,424,444	11,282,454	13,077,633	14,812,105	16,487,924	18,107,073	19,671,467	21,182,960	22,643,339	24,054,333	25,417,613	26,734,791	26,734,791	19,671,467	
NPV	- 2,747,503	2,211,057	4,201,404	6,124,444	7,982,454	9,777,633	11,512,105	13,187,924	14,807,073	16,371,467	17,882,960	19,343,339	20,754,333	22,117,613	23,434,791	23,434,791	16,371,467	

Base Analysis

Scenario Summary
10Yr NPV 16,371,467
15Yr NPV 23,434,791

Sensitivity Analysis

20% reduction in Wider Benefit
10Yr NPV 16,371,467
15Yr NPV 23,434,791

40% reduction in Benefits
10Yr NPV 8,502,880
15Yr NPV 12,740,875

1Yr Delay in Benefits
10Yr NPV 14,807,073
15Yr NPV 22,117,613

Slow Mobilisation (6month delay)
10Yr NPV 15,589,270
15Yr NPV 22,776,202

20% increase in costs
10Yr NPV 15,711,467
15Yr NPV 22,774,791

1Yr Delay and -20% Wider Benefit
10Yr NPV 14,807,073
15Yr NPV 22,117,613

Optimism Bias

0.10

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NB: Although S4C is a public sector organisation its advance rental payment of £3M in 2017 has not been included in Public Sector Investment above as it is a commercial occupancy arrangement and not an investment in the project per se.

CBA (Simplified) Option 1 - Do Minimum

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	15 Yr Total	10Yr 2026
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031		
Costs																	
Public Sector Investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Investment (discounted/bias factored)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative Costs (discounted/bias)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benefits																	
Cash-releasing benefits	-	82,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82,500
Non-Cash-releasing benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Jobs Created	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Construction Benefit	552,497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	552,497
Technology Jobs Created	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Theme Sector Benefit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Jobs Created	-	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Other Jobs Benefit	-	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	19,188,984
Induced Wage Benefit (Multiplier)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Benefits	552,497	2,214,609	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	2,132,109	30,484,528	19,823,981
Total Benefits (discounted)	552,497	2,139,719	1,990,347	1,923,040	1,858,010	1,795,179	1,734,472	1,675,819	1,619,148	1,564,395	1,511,492	1,460,379	1,410,994	1,363,280	1,317,178	23,915,951	16,852,627
Cumulative Benefits (discounted)	552,497	2,692,216	4,682,563	6,605,604	8,463,614	10,258,793	11,993,265	13,669,084	15,288,232	16,852,627	18,364,119	19,824,498	21,235,493	22,598,772	23,915,951	23,915,951	16,852,627
NPV	552,497	2,692,216	4,682,563	6,605,604	8,463,614	10,258,793	11,993,265	13,669,084	15,288,232	16,852,627	18,364,119	19,824,498	21,235,493	22,598,772	23,915,951	23,915,951	16,852,627

Base Analysis

Scenario Summary
10Yr NPV 16,852,627
15Yr NPV 23,915,951

Sensitivity Analysis

20% reduction in Wider Benefit
10Yr NPV 16,852,627
15Yr NPV 23,915,951

40% reduction in Benefits
10Yr NPV 10,111,576
15Yr NPV 14,349,570

1Yr Delay in Benefits
10Yr NPV 15,288,232
15Yr NPV 22,598,772

Slow Mobilisation (6month delay)
10Yr NPV 16,070,429
15Yr NPV 23,257,362

20% increase in costs
10Yr NPV 16,852,627
15Yr NPV 23,915,951

1Yr Delay and -20% Wider Benefit
10Yr NPV 15,288,232
15Yr NPV 22,598,772

Optimism Bias

0.10

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STPR Factors

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	STPR (%)	Factor	
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		3.5	97%
Factor	1	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969			

Depreciation (Not Impact)

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	30 Year Lifetime - linear		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Annualise	0.033333
Factor	1	0.966667	0.933333	0.9	0.866667	0.833333	0.8	0.766667	0.733333	0.7	0.666667	0.633333	0.6	0.566667	0.533333		(1-)	0.966667
1yr later		1	0.966667	0.933333	0.9	0.866667	0.833333	0.8	0.766667	0.733333	0.7	0.666667	0.633333	0.6	0.566667	0.533333		
2yr later			1	0.966667	0.933333	0.9	0.866667	0.833333	0.8	0.766667	0.733333	0.7	0.666667	0.633333	0.6	0.566667	0.533333	
3yr later				1	0.966667	0.933333	0.9	0.866667	0.833333	0.8	0.766667	0.733333	0.7	0.666667	0.633333	0.6	0.566667	0.533333333

GVA by Year Wales

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Inflation	
Construction	Weekly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Research	Weekly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Sectors	Weekly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction	Annual	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	40,560	
Research	Annual	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	45,240	
All Sectors	Annual	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	39,154	

Notes:
 Excluded for Economic Appraisal
 Skilled Trades
 Professional Occ. Wales
 Average All Sectors - SW Wales

<https://statwales.wales.gov.uk/Catalogue/Business-Economy-and-Labour-Market/People-and-Work/Earnings/averageweeklyearnings-by-occupation-ukcountry>
<https://statwales.wales.gov.uk/Catalogue/Business-Economy-and-Labour-Market/People-and-Work/Earnings/averageweeklyearnings-by-welshlocalarea-year>

<http://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/datasets/subregionalproductivityproductivityhourandproductivitybyunit2andn1.3subregionsoftheunitedkingdom>
 Average Swansea & NPT
 Priority Sector Statistics, 2016
 Welsh Government
 Average LS/CT

Multiplier
 Base 0 This uses the Base multiplier from the SBCR Internet Coast Economic Impact Assessment
 For sensitivity to this parameter please refer to this document