Technical note

Project:	Bermuda Connectivity Project	**To:**	Warwickshire County Council
Subject:	Economic Appraisal Update	**From:**	Atkins
Date:	6 Dec 2017	**cc:**	

Introduction

This technical note has been prepared following a request by Warwickshire County Council to update the economic appraisal of journey time benefits for the Bermuda Connectivity Project. The economic appraisal was previously undertaken in 2014 and the results were reported in the *Bermuda Connectivity Project Capital Growth Fund Business Case, Warwickshire County Council, September 2014.*

Since 2014 there has been some changes that necessitate an update of the economic appraisal. The main changes affecting the appraisal are summarised below:

- The scheme costs have changed following a value engineering exercise which de-scoped the scheme resulting in a reduction in scheme costs by 30% to 35%.
- The Paramics Microsimulation model has been updated, with new survey data. It now takes account of the latest Local Plan committed and highly likely developments or Local Plan aspirations.
- WebTAG values of time and fuel have been updated.

The purpose of this technical note is to outline the process undertaken to update the economic appraisal, detail the assumptions used, followed by reporting of the appraisal results.

Methodology and Assumptions

The economic appraisal was calculated using a spreadsheet model that uses forecast changes in journey times in different time periods to produce an economic benefit. Outputs from the Paramics traffic model of Nuneaton were input into the spreadsheet model to generate a monetary impact over the 60 years life of the scheme. These were then compared against the construction costs and maintenance costs on a consistent basis to generate a BCR (benefit to cost ratio) for the scheme.

The main limitation of the appraisal is that the only benefits which have been monetised are those arising from journey time savings. Other potential benefit streams have not been included (e.g. safety, vehicle operating costs, journey time reliability, air quality, noise, greenhouse gases).

A summary of the method used and the underlying assumptions for each stage of the appraisal is shown in Table 1.

Table 1. Summary of Method and Assumptions

Appraisal Element		Method / Assumptions

Input	**Traffic Modelling**	Vectos provided the following information from the Paramics model:
		• Network wide Car, LGV and HGV vehicle hour changes for the with and without scheme situation.
		• This was provided for the AM (0700-1000) and PM (1600-1900) peak periods a 2022 and 2031 modelled year.
		  ◦ The 2022 modelled year is from the 'Reference Case' model
		  ◦ The 2031 modelled year is from the 'Local Plan' model which includes development associated with the Local Plan (in both the 'with' and 'without' Bermuda model runs.

	Scheme Costs	• These were provided by F&G in September 2017.

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Appraisal Element		Method / Assumptions

		• WebTAG states that sunk costs should be excluded from the economic appraisal. The following line items were therefore removed from the costs included in the economic appraisal:
		  • WCC internal charges as notified on 23rd August 2017
		  • Capital costs incurred thus far (up to 16th August 2017).
		  • Future design commitments (inc. Atkins, SLC Rail and Business Case Refresh).
		  • Future Compensation Claims Assessment Report
		  • Updated Scheme Costs (as of 11th October 2016)
		  • Japanese Knotweed screening measures (as of 11th October 2016)
		• Note that the contingency figure of £500,000 has been included in the economic appraisal.
		• The spend profile has been assumed to be as follows:
		  • 2017 – 20%
		  • 2018 – 40%
		  • 2019 – 40%
		• Optimism bias of 3% has been applied to the scheme costs. This is consistent with WebTAG guidance[1] for a local authority scheme at *'Stage 3 – Full Business Case'*

	Maintenance Costs	• Assumed to be the same as the 2014 economic appraisal (£37,500 per annum over 60 years). • Construction inflation has been applied to the maintenance costs over the period 2017 to 2022 using the BCIS (Building Costing Information Service) rates with the GDP Deflator applied for the remainder of the appraisal period.
Process	**Opening Year**	• An opening year of 2019 has been assumed.
	Economic Parameters	• Economic Parameters have been taken from the WebTAG Data Book dated October 2017 Released v1.8.2
	Appraisal Period	• A 60-year appraisal has been undertaken in line with WebTAG guidance.
Outputs	**Presentation of results**	• The results have been presented in 2010 market prices discounted to 2010 (in line with WebTAG guidance).

[1] WebTAG Unit A1.2: Scheme Costs, July 2017.

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Appraisal Results

The economic appraisal results are detailed in Table 2.

Table 2. Bermuda Economic Appraisal Results

Bermuda Connection Economic Appraisal		**2010 market prices discounted to 2010**
Present Value of Costs (PVC)	Construction Costs	£6.864m
	Maintenance Costs	£1.320m
	Total PVC	£8,185m
Present Value of Benefits (PVB)	AM Peak Journey Time Benefits	£19,514m
	PM Peak Journey Time Benefits	£12,594m
	Total Journey Time PVB	£32,468m
Net Present Value (NPV)		£24,283m
Benefit to Cost Ratio (BCR)		**3.9**

The journey time benefits are mainly generated by savings made in the AM peak period. No account was taken of any changes outside of these time periods, but in reality it is likely that there will be additional benefits during these non-peak times of the day.

Based on DfT Value for Money guidance[2] a BCR of 3.9 represents '*High Value for Money'.*

[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/630704/value-for-money-framework.pdf