

From: [Information Management Team](#)
To: [REDACTED]
Subject: RE: LGOIMA Request - Cross Valley Connections – Lower Hutt Economic Appraisal Peer Review.
Date: Tuesday, 23 November 2021 4:30:00 PM
Attachments: [DOC 20 123032 Cross Valley Transport Connection PBC Economic Peer Review Official Issue 20201213 \(1\).PDF](#)

Tēnā koe [REDACTED]

I refer to your request dated 27 October 2021.

Please find attached the Cross Valley Connections – Lower Hutt Economic Appraisal Peer Review.

Please note that this email (with your personal details removed) may be published on the Council's website.

Nāku noa, nā

Kate Ostapowicz

Senior Advisor, Official Information

Hutt City Council, 30 Laings Road, Private Bag 31912, Lower Hutt 5040, New Zealand
M 027 265 5849 W www.huttcity.govt.nz

From: contact mailbox <contact@huttcity.govt.nz>
Sent: Wednesday, 27 October 2021 12:37 PM
To: Information Management Team <informationmanagementteam@huttcity.govt.nz>
Subject: LGOIMA Request

Name [REDACTED]

Organisation

Address [REDACTED]

Telephone

Mobile

Email [REDACTED]

Response By Email

Information requested The Cross Valley Connection Programme Business Case (as available at this link- <http://www.huttcity.govt.nz/Your-Council/Projects/cross-valley-connections>) says on page 114 that "Tony Brennand from Waka Kotahi was provided the detailed analysis completed to calculate the BCRs shown in Table 32." Can I please be provided with this detailed analysis.

File upload

Urgency

Reason

Invisible CAPTCHA 2021-10-27 12:35:22|



MEMO

To JAMIE ROWE

Cc

From TONY BRENNAND

Date 15 SEPTEMBER 2020

Subject CROSS VALLEY CONNECTIONS – LOWER HUTT ECONOMIC APPRAISAL PEER REVIEW

1. Purpose

The purpose of this memorandum is to provide a review of the economic appraisal of the proposed Cross Valley Connections in Lower Hutt undertaken by Cardno NZ in August 2020. In particular, this review attempts to consider the appropriateness of the economic appraisal in an uncertain future due to the induced economic downturn due to COVID19.

2. Basis of the Evaluation

Examination of the economic evaluation shows that the Economic Evaluation Manual processes have been appropriately applied in Cardno NZ's economic analysis. The determination of time zero, evaluation period and primary discount rate and the Do Minimum case are appropriate. Time zero is 2019

The option is appropriately defined and built in three stages. Stage 1 finishes 2021 (Active Mode Improvements), stage 2 finishes 2025 (Gracefield Interchange) and stage 3 finishes 2029 (CVL). The total undiscounted costs of the project being \$100.6 million at a 6% discount rate. A historic average traffic and cycling growth rate of 1.3% per annum has been used in the base case to forecast the performance of the Do Minimum and preferred option.

A base transfer of only 11,645 vpd has been reassigned from the Esplanade to the Cross-Valley Link. This is deliberately low to reflect high uncertainty associated with the current COVID 19 induced economic shutdown. Under the assumption that the whole of the local road network operates at 50 Kph in the base case the conventional discounted net benefits across all modes are estimated by Cardno NZ at \$229.4 million giving a benefit cost ratio of 3.6. This estimate is consistent with the Economic Evaluation Manual procedures.

Examination of benefits split show that travel time savings make up \$222.0 million followed by vehicle operating cost savings of \$4.3 million. Pedestrian and cycling benefits amount to \$2.4 million. These proportions and magnitudes are consistent with what is expected with projects of this kind.

Wider economic benefits of agglomeration, imperfect competition, increased labour productivity, land use uplift and resilience have been calculated. These discounted benefits are \$22.7, \$11.3, \$11.3, \$22.7 and \$34.0 million respectively totalling \$102.0 million. These numbers appear plausible although wider economic benefits have a degree of uncertainty with them and can be regarded as indicative.

Using the \$102.0 million of discounted wider economic benefits as a marker of the top end of the benefit range then the total discounted benefits for the project sit in the range of \$229.4 million to \$331.5 million with a benefit cost ratio in the range 3.6 to 5.3.

3. Dealing with the Uncertainties

Cardno NZ, in the current COVID19 induced economic downturn, have undertaken a broad range of sensitivity tests in order to appropriately address the current time of uncertainty and is required by the Economic Evaluation Manual. Cardno NZ have also undertaken further sensitivity tests at the request of the author of this document. There are differing kinds of uncertainty which will be discussed further below. Uncertainties can have both short run and long run implications.

As discussed above the base range is deliberately based on a low level of assignment from the Esplanade to the Cross Valley link of 11,645vpd. This is approximately half of that forecast by earlier modelling exercises for a pre-COVID19 scenario. The assignment is to partially to allow for a severe decline in demand due to the economic downturn and to ensure that any estimate the benefit cost ratio is not overstated. This approach is supported.

Various kinds of uncertainties are discussed below independently of one another based on the work of Cardno NZ.

a) Construction Uncertainties

Construction costs have been allowed to vary by Cardno NZ by $\pm 20\%$. This expands the benefit cost ratio range from the base of 3.6 - 5.3 to 3.0 - 6.6. This shows a reduction in construction cost improves the benefit cost ratio whereas an increase in cost decreases the benefit cost ratio.

b) Performance Uncertainties

The base case already assumes approximately half of the daily expected assignment from the Esplanade to the Cross-Valley Link does not occur because of the economic downturn. This is a severe reduction in assignment but an appropriate one when seeking not to overstate the benefit to cost ratio in the current uncertain environment. This is tested further with an assignment only 68.7% of the base assignment and with another assignment 29.0% higher than the base assignment. This expands the benefit cost ratio range from the base of 3.6 - 5.3 to 3.1 - 5.7. Lower levels of assignment reduce the benefit cost ratio and high levels of assignment increase the benefit to cost ratio.

c) Operational Uncertainties

At this point in time firm decisions regarding the operating speeds of both the Esplanade and the Cross-Valley Link have not been made. The base case developed by Cardno NZ assumes that both roads are operated at 50 Kph. The objective of improving the amenity and reduce traffic volumes on the Esplanade may lead to considering a posted speed limit of 40Kph or even 30 Kph on the Esplanade. For the same reason, supported by the good alignment of the Cross-Valley link, operating speeds of 60 or even 70Kph might be considered on the Cross-Valley Link. There is no reason why both roads cannot have a speed limit that attracts cars off the Esplanade and on to the Cross-Valley Link.

This expands the benefit cost ratio range from the base of 3.6 - 5.3 to 3.3 - 5.6. Reducing the Esplanade speed limit reduces the benefit cost ratio whilst increasing the Cross-Valley link speed limit increases the benefit to cost ratio.

d) Growth Uncertainties

A base per annum growth of 1.3% based on historic growth has been calculated as a long run average growth rate over the evaluation period. Sensitivity tests with annual growth rates of 1.1% per annum and 1.5% per annum have been undertaken by Cardno NZ. This is a long-range growth rate sensitivity test of approximately $\pm 15\%$. This expands the Benefit Cost Ratio range from the base of 3.6 - 5.3 to 2.7 - 6.4. Reduced growth rates decrease the benefit cost ratio whereas increased growth rates increase the Benefit to Cost Ratio.

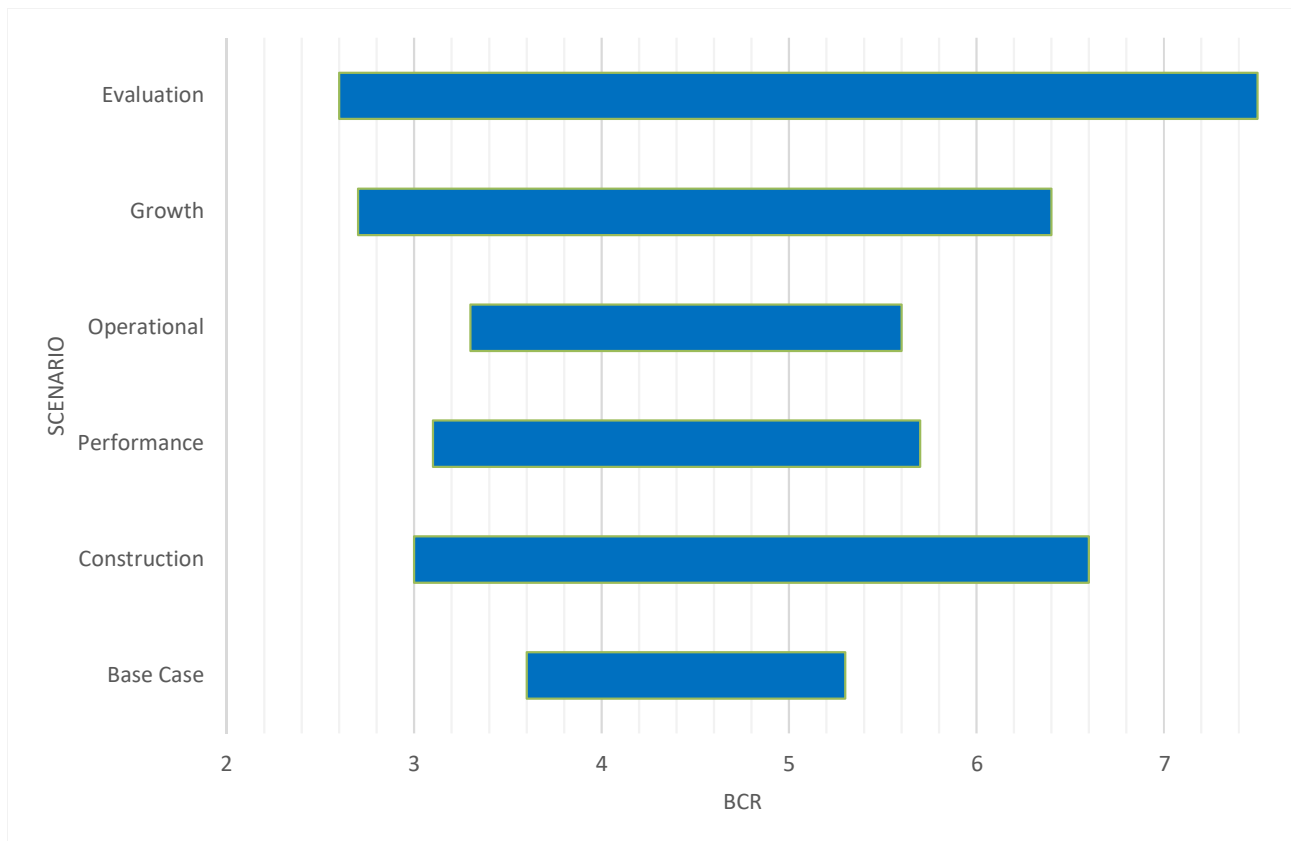
e) Evaluation Uncertainties

This is a sensitivity test undertaken by Cardno NZ based on changing the discount rate and evaluation period. Discount ratios of 4 and 6 percent and an evaluation period of 50 years was used. This expands the benefit cost ratio range from the base of 3.6 - 5.3 to 2.6 - 7.5. Reduced discount rates increase the benefit cost ratio whereas increased discount rates reduce the benefit to cost ratio. Increasing the evaluation period increases the benefit to cost ratio.

4. Bringing the Uncertainties Together

With multiple sensitivity tests undertaken by Cardno NZ there is a small chance that all the scenarios simultaneously take on extreme values. This is a real but very unlikely case. However, with multiple scenarios it is more likely that there will be a mix of values with one scenario partially offsetting another.

The chart below shows the Benefit Cost Ratio range (horizontal axis) for each of the scenarios independently evaluated by Cardno NZ. A statistical analysis of this chart shows that an amalgamation of the scenarios has a benefit to cost ratio that occupies a range from 3.2 to 6.0. This is consistent with a visual inspection.



The wide range of the benefit to cost ratio is the consequence of two contributing factors. These are the contribution of wider economic benefits, which are inherently uncertain, and the very uncertain times that exist due to the COVID19 induced economic downturn.

5. Key Findings

The work of Cardno NZ demonstrates that even under an assumption of a severe demand reduction due to the COVID19 induced economic downturn in the short term, the Benefit to cost ratio of the Cross-Valley Connections will at least be in the range of 3.2 to 6.0. The corollary is that the probability that the benefit cost ratio is less than 3.2 is very low.

Cardno NZ's analysis shows that the following factors acted to reduce the Benefit Cost Ratio:

- Increases in construction costs
- Reduced transfer of traffic from Petone Esplanade to be assigned to the Cross-Valley Link
- Lowering the speed limit on the Esplanade below 50 Kph
- Long run average traffic growth on the Hutt Network falling below 1.3% per annum
- Increasing the discount rate

These factors should be monitored.

Cardno NZ's analysis show that the following factors will increase the Benefit Cost Ratio:

- Reduction in construction costs
- Increased transfer of traffic from Petone Esplanade to be assigned to the Cross-Valley Link
- Increasing the speed limit on the Cross-Valley Link above 50 Kph
- Long run average traffic growth on the Hutt Network increasing above 1.3% per annum
- Reducing the discount rate or increasing the economic evaluation period beyond 40 years

6. Conclusions

- a) Cardno NZ's economic evaluation has correctly used the processes and procedures outlined in the Economic Evaluation
- b) Cardno NZ has applied an appropriate level of sensitivity testing to inform the uncertainties surrounding the benefit to cost ratio for the Cross-Valley Connections
- c) The benefit to cost ratio for Cross-Valley Connections is likely to sit within the range 3.2 to 6.0
- d) The probability that the benefit cost ratio for Cross-Valley Connections is less than 3.2 is very low.