From:	Sharon Bodeker
To:	Lee Vandervis
Subject:	LGOIMA re Rattray St railway corridor
Date:	Tuesday, 5 June 2018 12:29:51 p.m.
Attachments:	Response letter to Cr Vandervis re railway corridor.pdf Brief for feasibility study.pdf Correspondance.pdf Correspondence ONTRACK.pdf Further correspondance.pdf Hon Todd McClay.pdf Impact Consulting Memo.pdf Letter to Hon Todd McClay.pdf

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Dear Cr Vandervis

Please find attached information requested about the Rattray St railway corridor. I will send the information through in three emails due to the size of the information being sent. I apologise that I did not get these to you late last week as promised. Please note that I am still waiting for attachments to a feasibility report (Appendices A to E), which I will send through to you as soon as possible.

Kind regards

Sharon Bodeker
Team Leader Civic
Dunedin City Council

50 The Octagon, Dunedin 9016; PO Box, 5045 Moray Place, Dunedin 9058, New Zealand
Telephone: 03 477 4000; ext: 3231| Mobile: 021 178 5337
Email: Sharon.bodeker@dcc.govt.nz | www.dunedin.govt.nz

DUNEDIN CITY COUNCIL
Kaunihera-a-rohe o Otepoti

50 The Octagon, PO Box 5045, Moray Place
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www.dunedin.govt.nz

5 June 2018

Cr Lee Vandervis
lee@vandervision.co.nz

Dear Cr Vandervis

Local Government Official Information and Meetings Act 1987 (LGOIMA) request for information the Rattray Street railway corridor

I am writing in response to your official information request received on 30 April 2018 asking for all correspondence or other information on Council records relating to attempts to provide a ground level crossing of the railway corridor from Rattray Street to the Steamer Basin Area, including any proposal to move the St Andrew railway crossing to the Rattray Street position.

Please find attached the information requested. I note that the feasibility report refers to Appendix A to Appendix E. I am still in the process of obtaining those appendices, but once received, I will send through to you as soon as possible.

Yours sincerely

S. Bodeker

Sharon Bodeker
Team Leader Civic

Subject: OnTrack CEO's meeting

Meeting Notes - Jim Harland, CEO Dunedin City; Andrew Duncan, CEO Chalmers Property; David George, CEO of OnTrack New Zealand and Neil Davies, Commercial Leasing Manager OnTrack New Zealand

Recommendations to PCG

1. The information is noted.

2. A team to work with Mr Davies and Mr Campbell to prepare designs and costings on 1 to 4 above acknowledging that 2 and 3 are likely to be given priority by OnTrack.

Discussion / Background

On 9th May 2006 on behalf of the Harbourside Project, Mr Duncan and myself met with Mr George and Mr Davies to discuss the possibility of reopening the Rattray Street crossing. We were advised that the Board of OnTrack is quite risk averse with regard to vehicle and pedestrian crossings. When there is an accident inevitably they get poor publicity out of it even if it is the pedestrian or vehicle driver who is at fault! They understand there is a need for crossings, but their objective is to minimise the number where possible. Where a new one is proposed they try and seek the closing of an existing one. They did not wish to convey the impression that this prevented them from understanding our needs; it is just the basis on which the Board of OnTrack considers level crossings. In a typical year there are 10 deaths at level crossings.

We discussed the possible moving of rail yards. They would not be averse to this provided it was net neutral to themselves and their main operator Toll. While they haven't had detailed discussions with Toll their expectation/ understanding is that Toll would be seeking to move at no expense to themselves. There was general discussion as to the benefits, which are seen to be positive, of moving the marshalling yards closer to the Port.

David George also indicated that rail yards typically have more land than they need and to have such significant land resource locked up next to city centres such as in Wellington and Dunedin is inappropriate long term. From their perspective the priorities for a crossing at Rattray Street would be:

1. Relocate the rail yards which would leave through trains and a pedestrian/rail crossing with reduced risk for accidents.

2. Construct a pedestrian overpass which is well designed and an attractive feature in its own right. In this regard a structure which adds value to the Chinese Garden site may be appropriate.

3. Construct a pedestrian crossing at grade with appropriate protection barriers, etc in place.

4. A road/rail crossing at grade.

We discussed how these four ideas could be progressed and the advantages and disadvantages of each assessed in more detail. In the first instance it was agreed that Neil Davies and Neil Campbell (OnTrack, Dunedin) would work with relevant project team members from the Harbourside Project to scope these four options. Following this a decision could then be made on the commissioning of a more detailed study (OnTrack is not in a position to contribute). Mr George advised us that OnTrack has $3m available to do what they term public good

Dunedin City Council - Brief for consultancy services – Feasibility and Impact Assessment of Rattray Street crossing options

CONFIDENTIAL

INTRODUCTION

The redevelopment of Dunedin's harbourside is a joint project between the Dunedin City Council and Chalmers Properties Limited, the owners of much of the land.

The vision for the Harbourside area is:

" To reconnect the heart of the city to the harbour and to rejuvenate the harbourside area with a mix of land uses, public spaces and amenity areas."

As outlined in the Consultation document (July 2005), the objectives are;

- *To connect the city to the harbour*
- *To provide public access the harbour edge*
- *To enhance public facilities and amenities on the harbourside*
- *To enhance the character and visual amenity of the area*
- *To enable better use of land*
- *To plan for growth*
- *To provide for housing choice*

The vision is in the process of being updated. A revised vision plan (May 2006) and structure plans, to be issued for public consultation in July / August, will be provided to the successful tenderer.

BACKGROUND

Improved access to the Harbourside area via Rattray Street is one of the key objectives of the project. Discussions have been held with ONTRACK, Toll NZ and Transit NZ regarding the possible reinstatement of vehicular and pedestrian access across Rattray Street. ONTRACK have expressed concerns about the impact of this on their shunting operations.

Recently the Chief Executives of Chalmers Properties Ltd. and Dunedin City Council met to discuss the issue with the Chief Executive of ONTRACK. It was agreed that the feasibility of four options for a crossing at Rattray Street be assessed. A fifth option has subsequently been suggested. The notes of this meeting are attached as Attachment A.

SCOPE OF WORKS

Investigate and prepare a project feasibility report (PFR) for the various options for a crossing on the line of Rattray Street to provide linkage between the central City and the harbourside area. The first option involves assessing the feasibility of relocating the rail shunting yards while options 2.1-2.4 involve accesses across the rail corridor and arterial route with the shunting yards remaining in place.

- A briefing to be provided by the Council's Transportation Planning Department and the City Architect
- Concept plans prepared for a possible road crossing and signalised intersection.

PROJECT TEAM

The Council has established a Project Team to lead this project. The Consultant should allow for at least 3 meetings with the Project Team during his/ her engagement and also a day to present his / her findings to a wider project group.

DELIVERABLES

A draft PFR, detailing effects and costs and benefits for each option. The PFR must include the basis on which all costs and benefits have been prepared and an assessment of the degree of confidence with these costs and benefits.

Comments on the draft reports will be provided within 10 working days of their receipt.

Timeframe

Consultant Engaged by 31 July.
Complete draft PFR for item 1 by 27 October and deliver final report by 1 December
Complete draft PFR for items 2.1-2.4 by 15 September, and deliver final report by 6 October.
Note: The preliminary assessment of the economics for Item 1 needs to be available at the time the final PFR for Items2.1-2.4 is delivered.

SUBMISSION REQUIREMENTS

Proposals must be no more than 5 pages in length and must cover;

- The proposed methodology for each part of this work
- The track record of company with similar work
- A fee proposal with the fees for Item 1 separated from the fees for Items 2.1-2.4
- The names and contact details of clients for projects referred to in the track record

CV's of relevant staff to be appended and can be additional to the 5 page limit.

Rebecca Murray

From: Don Hill
Sent: Thursday, 12 October 2006 02:50 p.m.
To: Nicola Pinfold
Subject: FW: Rattray St

FW: Attn: Don Hill Transporta...

FYI

-----Original Message-----
From: Don Hill
Sent: Thursday, 12 October 2006 2:49 p.m.
To: 'monarch@wildlife.co.nz'
Subject: Rattray St

Your email re reinstating a vehicle crossing on the line of Rattray Street refers.

While it is included in the Council's Transportation Strategy it is totally dependent on ONTRACK and Toll granting consent. We are currently developing options for further discussion with rail interests so this can be progressed . The Strategy provisionally programmed the physical works for 2013/14.

Don Hill
Manager, Transportation Planning
Dunedin City Council

50 The Octagon, Dunedin 9016; Box 5045, Dunedin 9058 New Zealand
ph:03 477 4000 Fax: 03 474 3451
Email:dhill@dcc.govt.nz; www.CityofDunedin.com

Rebecca Murray

From: Stephanie Gilfedder
Sent: Thursday, 12 October 2006 01:32 p.m.
To: Don Hill
Subject: FW: Attn: Don Hill Transportation Planning Manager

Importance: High

Hi Don

This came via the website for your attention.

Thanks
Steph
-----Original Message-----
From: Monarch Wildlife Cruises [mailto:monarch@wildlife.co.nz]
Sent: Thursday, 12 October 2006 11:01 a.m.
To: dcc@dcc.govt.nz
Subject: Attn: Don Hill Transportation Planning Manager
Importance: High

Dear Mr Hill

Transportation Strategy - Harbour Basin Development

As I have indicated in submissions to the DCC Transportation Strategy the key to Harbour Development is to improve the access to the area. This is clearly best achieved by reinstating the vehicular access to the area across the railway line at the bottom of Rattray Street. This is in my view the priority for any other Harbour Basin Development projects.

I would be grateful if you could confirm that reinstating this vehicular access is still proposed as part of the Transportation Strategy and provide an indicative completion date for this work.

Many thanks.

John Milburn
Owner
Monarch Wildlife Cruises

Office of Hon Dr Michael Cullen

Deputy Prime Minister
Attorney-General
Minister of Finance
Minister for Tertiary Education
Leader of the House of Representatives

30 JUN 2006

Peter Chin
Mayor
Civic Centre
PO Box 5045
DUNEDIN

Your Worship

Thank you for your letter of 2 June 2006.

Following our encounter in Dunedin and your subsequent letter, I have had opportunity to acquaint myself with the issues surrounding the road/rail crossing at Rattray Street.

As you mention, the recent meeting between the Dunedin City Council and ONTRACK returned divergent preferences for a crossing at Rattray Street, with ONTRACK preferring to relocate the rail yards and establish a pedestrian overpass, against the Council preference for a road/rail crossing at grade.

Following further enquiries, I have been advised that ONTRACK's position remains that a road/rail or pedestrian only crossing at this position is not a preferred solution. I also understand the former Rattray Street crossing was closed under a formal agreement with Council a number of years ago.

However, given the wider implications for Dunedin of the Harbourside development, I have asked ONTRACK to consult further with Council so as to determine the scope of options available, while continuing to reconfirm our safety objectives in respect of the operational railway.

Thank you again for writing.

Yours sincerely

Hon Dr Michael Cullen
Minister of Finance

Parliament Buildings, Wellington, New Zealand. Telephone: (04) 470 6551, Facsimile: (04) 495 8442

Rebecca Murray

From: Don Hill
Sent: Monday, 26 June 2006 10:08 a.m.
To: Nicola Pinfold
Subject: Brief for rattray St options

Hi Nicola,

I have just been reading the brief for the ngagemment of consultants as it now stanads and am a somewhat confuded by the NB note at the bottom of page 1.

In the para above we say the first option involves investigating the feasibility of relocating the shunting yards while the note says this is the subject of a separate study.

Soi what is option 1?

Regards Don

Meeting with Transit 30 May 06

Present
Mike O'Cain
David McConoghal?

Robert Tongue
Christine Ralph
Nicola
John Sule
Nicholas Karlovsky
Phil Dowsett

ISSUES DISCUSSED

Rattray Street Options

Updated on 4 options discussed by ONTRACK and PCG

MO advised
- can't look at Rattray St in isolation
- Concern to maintain efficiency of arterial
- Few concerns about pedestrian options, unless they involve stopping the traffic on the arterial. (

It was agreed that Ph ilk and David M to take a view on whether modelling is required **. Action: PD / DM (by 7 June)**

Relocation of the rail yard
- question how much freight will come by road – impact on SH88.

Pedestrian overpass
MO – must go across road as well as rail.
PD – needs to have clearance for a 6m x 9m box for large loads unless alternative routes can be identified for over dimension size / overweight loads.
Depressing the road was suggested as an option.

South Basin
MO felt Roberts St junction unsafe – no objection to closing junction.
PD – right turns out difficult at Plato junction. .
MO – no problems with changing access in short term but need to look at progression of change and land uses. MO questioned whether proposed land uses for south basin would require links to City. Limitations on stacking and sight distances at Plato junction due to pillars.
PD confirmed that DCC longer term vision was to move SH out of town so arterial will continue to have an long term role.

DUNEDIN CITY COUNCIL
Kaunihera-a-rohe o Otepoti

CHALMERS PROPERTIES LIMITED

Mr David George
Chief Executive
ONTRACK
P O Box 593
Wellington

2 May 2007

Dear Mr George

LONG-TERM VISION FOR DUNEDIN'S HARBOURSIDE
SHUNTING MOVEMENT DATA FOR DUNEDIN

Thank you for your letter of 20 April 2007. I am reassured by your response regarding access to information and would most appreciate if you would seek up to date information from Toll NZ on shunting movements for the Rattray Street area on our behalf. The latest information to which we have access is from 4 April 2004.

As requested in your letter I confirm that the five options under consideration are as follows:

Option 1 – Relocate the shunting yards and construct a link at Rattray Street.

Option 2.1 - Construct a pedestrian overpass across the rail corridor and Thomas Burns Street

Option 2.2 – Construct at- grade pedestrian crossings of the rail corridor and Thomas Burns Street, with appropriate protection controls and safety.

Option 2.3 – Construct an at-grade road crossing of the rail corridor with appropriate

Option 2.4 – Construct a part-time at-grade rail crossing with traffic signals at the intersection with Wharf Street, with the crossing only being open at peak traffic follow times.

If you require any further information relating to the options under consideration, please contact Nicola Johnston in the Harbourside Project Team on 021 467 2750 or by email: njohnsto@dcc.govt.nz

Yours sincerely

Peter Chin
Mayor

cc:	Neil Campbell	Ontrack
	Jim Harland	Chief Executive, Dunedin City Council
	Don Hill	Transportation Planning Manager, DCC

ONTRACK
New Zealand Railways Corporation Rere Totika

File: CEO100-05

17 April 2007

DCC
20 APR 2007
INFORMATION MANAGEMENT UNIT

Mr Peter Chin
Mayor
Dunedin City Council
P O Box 5045
DUNEDIN

Dear Mr Chin

Thank you for your letter of 19th February 2007.

I understand the importance you attach to opening up the harbourside area in Dunedin and I note your concern at not being able to gain the information you seek to help you make an assessment of the options you are considering.

ONTRACK has no issue with you having access to information which may assist you and in as much as it relates to us, we're happy to provide it. We're also happy to seek up-to-date information on shunting movements from Toll NZ on your behalf.

While we applaud the concept of developing a harbourside precinct in the city, we are of course obliged to fulfill our obligations in terms of meeting safety requirements. At the site meeting you refer to, our representative quite rightly raised the safety implications of the at-grade crossing options you are considering.

The Rattray Street location is between the rail marshalling and passenger yards and it is not uncommon for trains to straddle, be shunted backwards and forwards or have brake testing undertaken in the area. Trains can often be stationary or moving slowly across the crossing for extended periods. It would be understandable that a motorist or pedestrian, crossing under such conditions, may become frustrated at the long delay and seek to cross. The result could be them being either seriously injured or killed.

As good stewards of the rail corridor it would be wrong of ONTRACK to agree to a proposal that compromised safety as well as the viability of the rail operation in its current form at this site.

Your letter only mentions two of the five options considered by your consultant. Depending on what the other options are, we are happy to discuss alternatives that are complementary to our objectives and that of the rail operator Toll Rail.

Kind regards

David George

David George
Chief Executive

Level 4, Wellington Railway Station, Bunny Street,
PO Box 593, Wellington, New Zealand
Tel +64 4 495 3000, Fax: +64 4 495 9045

19 February 2007

Hon David Benson Pope MP
Electorate Office
220 King Edward Street
SOUTH DUNEDIN

Dear David

DUNEDIN HARBOURSIDE – RATTRAY STREET CROSSING

Further to my letter of 30 November last year (copy enclosed), we have now received a draft consultant's report on the options for the crossing at Rattray Street. The five options set out in my earlier letter were assessed. They include:

(i) Relocation of the shunting yards and provision of an at-grade crossing for vehicles and pedestrians.
(ii) Crossings which assume the shunting yards remain in place. (Four sub-options).

Meetings were held with representatives from ONTRACK and Toll to discuss the options and to get an idea of ONTRACK and Toll's requirements for a crossing in the location of Rattray Street. I am advised that at this meeting the ONTRACK and Toll representatives would not discuss, or even consider, the at-grade crossing options due to their concerns with the safety implications of these options.

Accordingly, in assessing the options the consultants had to base the assessment on shunting data from a 2004 survey provided by Dunedin City Council, because more recent shunting data was not available.

In view of the importance of this crossing to opening up of the harbourside area and the importance of ensuring an objective assessment of the Rattray Street options, I am writing to ask whether you might assist in securing the release of up-to-date shunting movement data (and other relevant data) to enable an objective assessment of the options to be completed. We would be most grateful for any assistance you could provide in having ONTRACK reconsider their position on the release of data and on discussing the issues.

Thank you for your offer of support and in anticipation of your assistance with this critical element of the rejuvenation of Dunedin's harbourside.

Regards

Peter Chin
MAYOR

cc Hon. Dr. Clive Matthewson - ONTRACK Board
Harbourside Project Control Group

30 November 2006

Hon David Benson Pope MP
Electorate Office
220 King Edward Street
SOUTH DUNEDIN

Dear David

DUNEDIN HARBOURSIDE – RATTRAY STREET CROSSING

Further to our recent discussions regarding the redevelopment of Dunedin's harbourside, as I explained, the City Council considers the reinstatement of vehicular and pedestrian access between Rattray Street and the harbour basin as a critical element of the rejuvenation of the area.

We have been in discussion with OnTrack for over a year now, exploring options for improved access. The preference of the Harbourside Project Control Group is for an at-grade crossing (Option 1 described below) followed by Options 2a – 2d:

Option 1 Relocation of the shunting yards and provision of an at-grade crossing for vehicles and pedestrians.

Option 2 Crossings which assume the shunting yards remain in place. (Four sub-options).

a) At-grade road/rail crossing of the rail corridor with appropriate protection control and traffic signals at the intersection with Thomas Burns Street and Fryatt Street.

b) Part-time at-grade road/rail crossing with traffic signals at the intersection with Wharf St, with the crossing only being open at peak traffic flow times.

c) At-grade pedestrian crossing of the rail corridor and Thomas Burns Street, with appropriate protection controls and safety.

d) Construction of a pedestrian overpass across the rail corridor and Thomas Burns Street, with full access for pedestrians.

OnTrack have made it clear that they are not prepared to consider an at-grade crossing, unless the shunting yards are relocated. Hence their preference is for Option 2d. We note however, that overseas and elsewhere in New Zealand, the safety risks are effectively minimised using barriers. While it is acknowledged that there will be some frustration for drivers when the barriers were closed, (assuming a maximum of 50 minutes in a 24 hour period based on current data) drivers would have the option to use the St Andrew Street crossing.

In order to progress this matter, the City Council commissioned Beca Consultants to assess the feasibility of the various options. The results of that work are due within the next fortnight.

We would be most grateful for any assistance you could provide in having OnTrack reconsider their position and undertake an objective review of the options.

Thank you for your offer of support and in anticipation of your assistance with this critical element of the rejuvenation of Dunedin's harbourside.

Regards

Peter Chin
MAYOR

cc Harbourside Project Control Group

ONTRACK
Southern Area Office
PO Box 904
Dunedin

Mr Malcolm Farry
Chairman
Harbourside Project Control Group
Dunedin City Council
PO Box 5157
Dunedin

March 23 2006

Dear Mr Farry

DUNEDIN: POSSIBLE RELOCATION OF SHUNTING YARD

Your letter of January 19 refering to the possibility of relocating the Dunedin railway shunting yards to Sawyers Bay or Blanket Bay, addressed to David George CEO, has been referred to me for a response. In this letter you sought ONTRACK's agreement in principle to commissioning a study of this idea.

ONTRACK does not wish to commission a study of this idea, but is happy to participate in such a study if the DCC or Chalmers Property decides to progress this. ONTRACK is not in a position to help fund such a study other than through the time of the staff involved.

While local Management of Toll Rail was present at the meetings where this idea was discussed it would be prudent to obtain Toll's view of this idea at a senior level before any study commences, as their support and input will be required if significant progress is to be made.

Relocation of the marshalling yards to a suitable site much nearer to the Port was a response to the problem of creating extra level crossings to access the harbour. Please note that any surplus railway land that may become available as a consequence was not discussed at any stage, although it was mentioned, and it should not be assumed that such land would be available for "other new uses" as mentioned in your letter.

Discussions we have had locally with Toll suggest that relocation of the marshalling yard to Blanket Bay rather than Sawyers Bay would be a more desirable site from a train operation point of view and any study should focus on this in the first instance.

Should you decide to progress with the study, I would be happy to assist with establishing parameters etc if required.

Yours sincerely

Neil Campbell
Southern Service Manager
ONTRACK
Phone 03 4793310

DUNEDIN CITY COUNCIL
Kaunihera-a-rohe o Otepoti

CHALMERS PROPERTIES

Mr David George
Chief Executive
ONTRACK
P O Box 593
Wellington

19 January 2006

Dear Mr George

LONG-TERM VISION FOR DUNEDIN'S HARBOURSIDE
POSSIBLE RELOCATION OF SHUNTING YARDS

Following the launch of the draft long-term vision for Dunedin's Harbourside in July last year, discussions have continued between the Project Team and your staff locally regarding the practical implications of the proposals.

It has been identified through preliminary discussions at the local level that there are potentially sound operational benefits to Toll / ONTRACK from relocating the rail shunting yards from the central city to a location closer to Port Chalmers, such as Sawyers Bay or Blanket Bay. This potentially provides benefits to the City Council and Chalmers Properties Ltd. in facilitating the reinstatement of the crossing at Rattray Street to improve access to the Harbourside, and by releasing land from operational railway use to other new uses.

We are writing to seek your in principle agreement to commissioning a study to assess the feasibility and potential costs & benefits of relocating the rail yards. The study would need to consider a range of options. As the project potentially has benefits to the Harbourside project we are willing to discuss potential sharing of costs of this work.

Please contact me, or Nicola Johnston in the Harbourside Project Team, if you wish to discuss this further. My phone number is 03 477 0927. Nicola can be contacted on 03 474 3327. I look forward to hearing from you in the near future.

Yours sincerely

Malcolm Farry
Chairman
Harbourside Project Control Group

cc: Jim Harland, Chief Executive, Dunedin City Council
Andrew Duncan, Chief Executive, Chalmers Properties Limited
Neil Campbell, Ontrack
Don Hill, Transportation Planning Manager, DCC

Rebecca Murray

From: Adrianne Reid <Adrianne.Reid@parliament.govt.nz>
Sent: Monday, 22 August 2016 12:11 p.m.
To: Vivienne Harvey
Subject: RE: At grade rail crossing Rattray Street, Dunedin
Attachments: 22082016120858-0001.pdf

Dear Ms Harvey,

Please find **attached** a response from the Minister for State Owned Enterprises, Hon Todd McClay.

Yours sincerely,

Adrianne

Adrianne Reid | Senior Advisor, State Owned Enterprises | Office of Hon Todd McClay | Level 19R Bowen House, Parliament Buildings, PO Box 18041, Wellington 6160, New Zealand | T: 04 817 9877 | M: 021 518 430 | E: adrianne.reid@parliament.govt.nz W: http://www.beehive.govt.nz and http://www.parliament.nz

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From: Adrianne Reid
Sent: Friday, 29 July 2016 2:49 p.m.
To: 'vivienne.harvey@dcc.govt.nz'
Subject: RE: At grade rail crossing Rattray Street, Dunedin

Dear Ms Harvey,

The Minister for State Owned Enterprises, Hon Todd McClay, has asked me to acknowledge, with thanks, Dr Bidrose's correspondence received on Friday 29 July 2016 regarding the at grade rail crossing at Rattray Street, Dunedin.

Consideration is currently being given to the matters raised in the correspondence, and Dr Bidrose may expect a reply at the Minister's earliest opportunity.

Thank you again for taking the time to write.

Yours sincerely,

Adrianne Reid

Adrianne Reid | Senior Advisor, State Owned Enterprises | Office of Hon Todd McClay | Level 19R Bowen House, Parliament Buildings, PO Box 18041, Wellington 6160, New Zealand | T: 04 817 9877 | M: 021 518 430 | E: adrianne.reid@parliament.govt.nz W: http://www.beehive.govt.nz and http://www.parliament.nz

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From: Vivienne Harvey
Sent: Friday, 29 July 2016 2:15:51 p.m.
To: Hon Todd McClay
Subject: At grade rail crossing Rattray Street, Dunedin

Dear Minister McClay

Please find attached a letter from Dr Sue Bidrose, CEO, Dunedin City Council.

Regards

Office of Hon Todd McClay

MP for Rotorua
Minister of Trade
Minister for State Owned Enterprises
Associate Minister of Foreign Affairs

22 AUG 2016

Dr Sue Bidrose
Chief Executive Officer
Dunedin City Council
PO Box 5045
Moray Place
DUNEDIN 9058

Dear Dr Bidrose

Thank you for your letter of 29 July 2016 regarding your proposed pedestrian and cyclist rail crossing at Rattray Street in Dunedin.

I have been advised by KiwiRail that such a level crossing is untenable due to safety concerns as the proposed crossing point extends across operational rail yards, and the cost of relocating these facilities would be prohibitive. KiwiRail also consider the only viable solution is a pedestrian overbridge or underpass; for which KiwiRail has indicated it will work with Council around air rights and design clearances for an overbridge if there is a desire to pursue this option.

This is an operational matter for KiwiRail. In accordance with section 5(2) of the State-Owned Enterprises Act 1986, such operational issues are the responsibility of the state-owned enterprise's Board, and I am unable to get directly involved in this matter. I suggest that Dunedin City Council engages directly with KiwiRail on this matter and the potential for an overbridge or underpass for pedestrians and cyclists. I may be available to meet with a Council representative if the matter remains unresolved following your direct engagement with KiwiRail.

Thank you for taking the time to write.

Yours sincerely

Hon Todd McClay
Minister for State Owned Enterprises

Private Bag 18041, Parliament Buildings, Wellington 6160, New Zealand. Telephone 64 4 817 6838 Facsimile 64 4 817 6538

IMPACT CONSULTING

MEMO

To	Richard	Saunders
Cc	Dougal	List
From	John	Hannah
Date	28th	October 2016
Subject	Rattray St Overbridge Project "Gaps Assessment & Project Development Time-Line	

1. Purpose

To provide advice to Dunedin City Council (DCC) (Richard Saunders) on the status of previous investigation work undertaken on this project and propose a "Gaps" analysis and an approximate project development time-line should the Council wish to peruse the project.

2. Background

In 2006 / 2007 DCC had various options for a crossing of the Rail to connect Rattray St with Fryatt St investigated to provide pedestrians and cycle access on a more direct route between the City.

There was at that time a proposed land use plan change for a large area of the Harbour frontage to a zoning now called "Harbourside" as well as signifficantly improve access from the City Centre to the Harbour.

Beca prepared an extensive Project Feasibility Report dated March 2007 which assessed land use planning, heritage and access issues particularly associated with the Rail Yards and the Shunting activities.

This report investigated five options, some of which were derivations of similar options.

The report sets out in reasonable detail land use and heritage issues including the visual amenity considerations. It also assesses costs and benefits for the various options.

In October 2016 Opus undertook a further simple review of estimates and used modified design options, with one attempting to take account of the Chinese Gardens, which were not in existence at the time of the Beca Feasibility Report in 2007.

3. Review & high level comments on previous documentation

The Beca Feasibility report looked at three main options-

a. At grade crossings of the Rail. There were various sub options but KiwiRail opposed any form of level crossing and more recently KiwiRail have been even more resistant to new rail crossings generally. These options were shown to have little if any land use and heritage planning issues and were relatively low cost.
b. An option to relocate the Rail Shunting Yards to Blanket Bay at a cost of approximately $115 M (2007 $'s). This option was investigated to improve the likelihood of KiwiRail agreeing to an at grade pedestrian / cyclist crossing by removing any interaction with shunting operations but that didn't change the KiwiRail view. Kiwi Rail indicated that they would be unlikely to contribute in any substantial way to the costs and were still opposed to the level crossing even with the shunting yards removed.

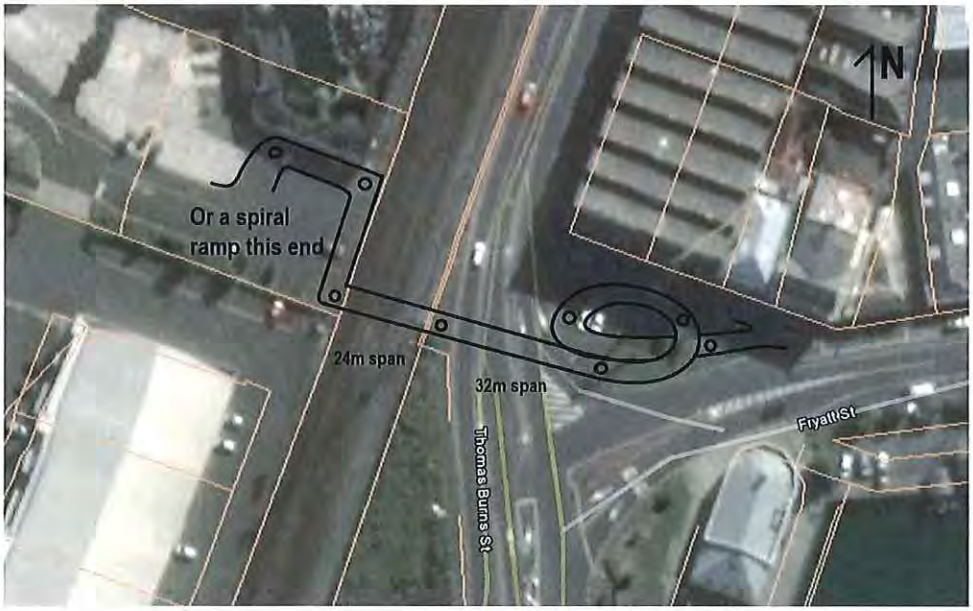
c. The third option was a pedestrian / cycle overbridge connecting Rattray St to Fryatt St. This option had an overbridge spanning the rail and Wharf St. It proposed Z Zag ramps at each end which in today's design expectations for a cycleway would not be desirable. The planning and heritage analysis showed a wide range of challenges from both land use and heritage points of view and whilst the Chinese Gardens were not constructed in 2007 there were planned and the report noted likely visual issues that an overbridge could cause to the Gardens.

The following is an air photo showing the overbridge option.

4. 2016 Opus review of Costs for the Overbridge Option

This work was to update the cost estimate from the Beca report of 2007 but in doing so Opus explored some variations to basic design by changing the connecting ramps to circular or "L" shaped. They also considered a shorter option that could potentially reduce the visual impact on the now constructed Chinese Gardens, both the view from and into the gardens.

Below are views of this option-



There were two updated estimates-

- For an Overbridge from Queens Gardens to Fryatt St approximately $8.9 M
- For an Overbridge from the Chinese Gardens to Fryatt St approximately $4.9 M

These were very preliminary estimates and Opus noted the following exclusions as directed by DCC staff-

- The foundation estimates were provided based on "local knowledge" but noted that the ground was reclaimed and the costs could be significantly different.
- There was no allowance for "Urban Design" elements which could be significant given the planning and heritage aspects of the area.
- The estimate only took a very small account of the constructions issues in the urban environment and across the live rail.
- Designating and consenting costs
- No property costs
- Opus were not required to provide any supporting report for their work.

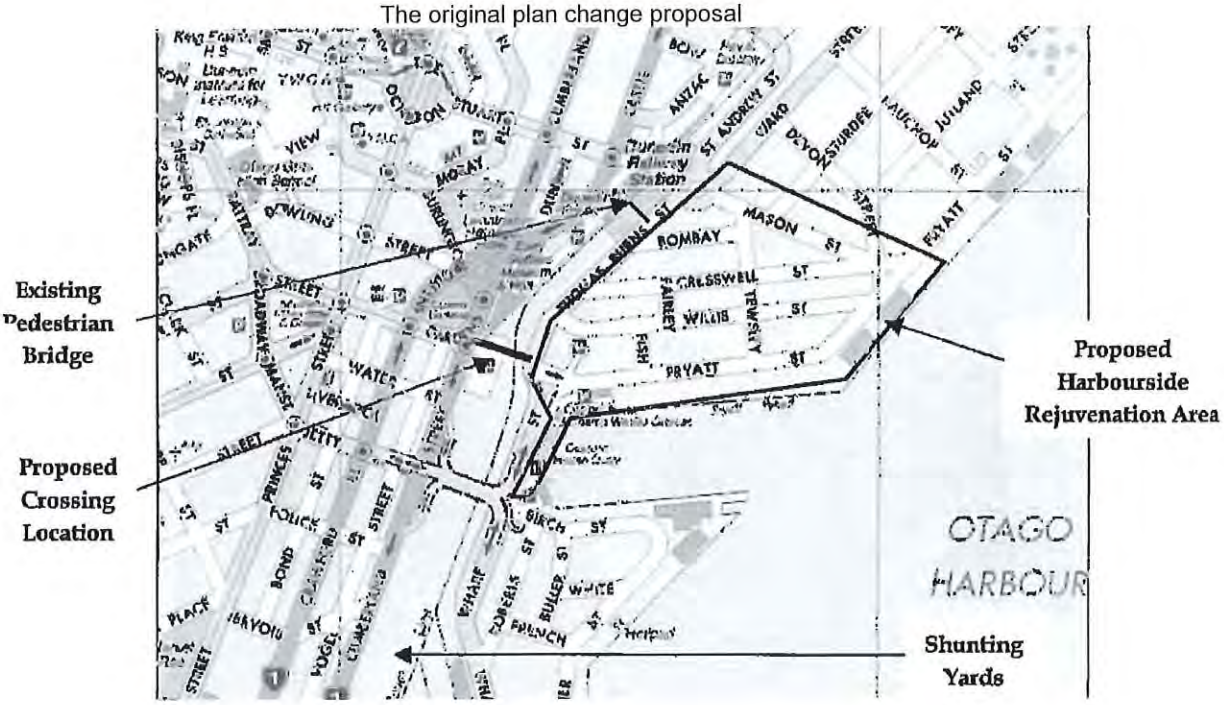
5. Gaps analysis

To enable the project to move forward there needs to be-

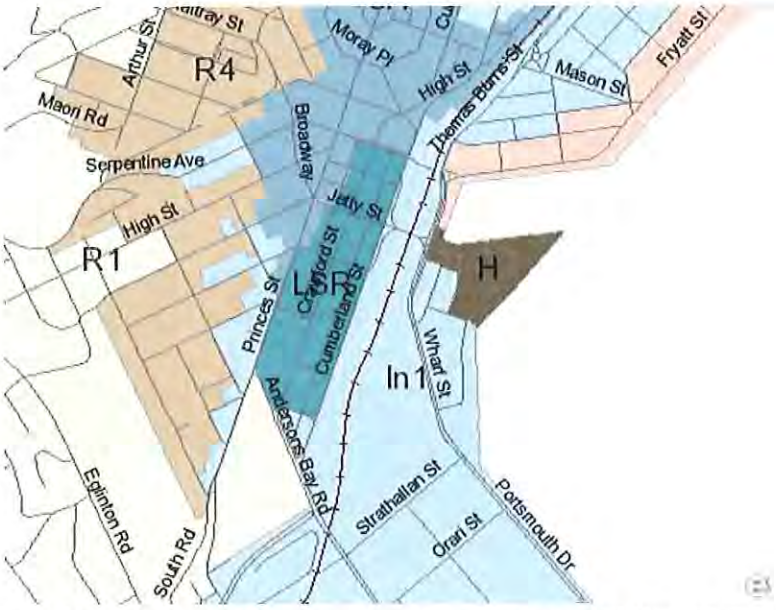
a. **A new planning assessment.**

- A review of the planning, historical and visual effects of the two Opus options
- These options seem to be more appropiate than the earlier Beca Overbridge option as they propose a more acceptable level of service for Cyclists.
- These Opus options have had no development other than to provide a photo montage and Air Photo to assist with understanding the options.
- The original planning assessment was completed in 2007 and appears to have been influenced to a degree by a proposed plan change for a more extensive "Harbourside" zoning. The extent of this change was significantly reduced by council.

The original plan change proposal



The current District Plan (Area "H" shaded brown is the "Harbourside" zone)



- To enable an updated "Planning Assessment" to be undertaken the revised scheme layouts detailing location of options need to be in 3D to enable the assessment to be completed to an acceptable level including assessment from a heritage visual point of view.

b. Constructability and Cost Estimates (Consenting, design, tendering, construction and construction management)

- **Geotechnical**- As noted in the covering email to the Opus estimate update in 2015 and in the Beca 2007 options report the major construction cost risk is with the proposed Overbridge foundations. The site is on mostly reclaimed land that will not have been particularly well-engineered to meet today's design criteria. To enable a cost estimate to be prepared with a likely hood out-turn cost better than + / - 75% it is suggested that at least one geotechnical investigation bore is undertaken at the location of each pier or abutment. Estimated costs for these investigations could be gained from local geotechnical investigation providers. $?
- **Overbridge Construction cost** - With the above suggested revised scheme layouts and geotechnical investigations a construction cost estimate of + / - 25% should be possible. This estimate should also consider a preliminary construction methodology which includes considerations around working over a "live" rail corridor and traffic management in the area. A preliminary "safety in Design" assessment would assist this approach.
- **Design and Construction management** costs - From this estimate it would be reasonable to assign the design costs at 5% and the construction management costs at 4% of the estimated construction cost.
- **Designation and Consenting** - The designating (a designation of the air space over the rail would be a minimum but there may be others required), consenting, including visual and heritage aspects and likely hearings (not including any Environment Court appeals) is likely to cost somewhere between $100 k and $150 k but this would be able to be better understood upon the completion of the planning assessment.

c. Option Assessment

- All the above should include assessment of at least two options to support the necessary planning designation and consenting processes.

d. **Project time line**

- Undertake the preparation of revised scheme layouts detailing location of options in 3D including a basic level of "Urban Design" developed so the options can be assessed from a heritage visual point of view. – **Four Months**
- Prepare a "Planning Effects Assessment – **Four Months**
- Geotechnical investigations – **Four Months**
- Prepare cost estimates – **Two Months**
- Option assessment – **Two Months**
- Preparation of designation and consenting applications – **Three Months**
- Submission and processing / decisions of designation and consenting applications – **4 Months.**
- If there were appeals to the above decisions, it could take up to – **Twelve Months** to resolve and have an agreed scheme to progress to detailed design and construction.
- Detailed design – **Six Months**
- Tendering and award – **Three Months**
- Construction – **Twelve Months**

- This suggests that subject to the designations and consents not being appealed it would be approximately two years before detailed design could commence. This could be shortened by completing some of the above tasks in parallel but care is needed to reduce the risk of re-work due to pre-required information not having been completed.
- If Council decide to undertake further investigations on this project I would suggest a consultant be engaged with a contract that has separable portions and hold points at which the Council could decide to not proceed. With this approach it would result in there being a consistent approach and connected team who could be held responsible for the previous portions of work.

Please feel free to discuss the above before I finalise it.

John Hannah
Impact Transport Consulting Ltd.
john@impacttransport.co.nz
Ph +64 21 902 685

DUNEDIN CITY COUNCIL
Kaunihera-a-rohe o Otepoti

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Dunedin 9058, New Zealand
Telephone: 03 477 4000, Fax: 03 474 3488
Email: dcc@dcc.govt.nz
www.dunedin.govt.nz

29 July 2016

Hon Todd McClay
Minister of State Owned Enterprises
Freepost Parliament
Private Bag 18 888
Parliament Buildings
Wellington 6160

Dear Minister McClay

I recently spoke to KiwiRail staff about an at-grade crossing in Dunedin which was closed off some years ago. The crossing at Rattray Street is a critical connection between the central city and Dunedin's waterfront.

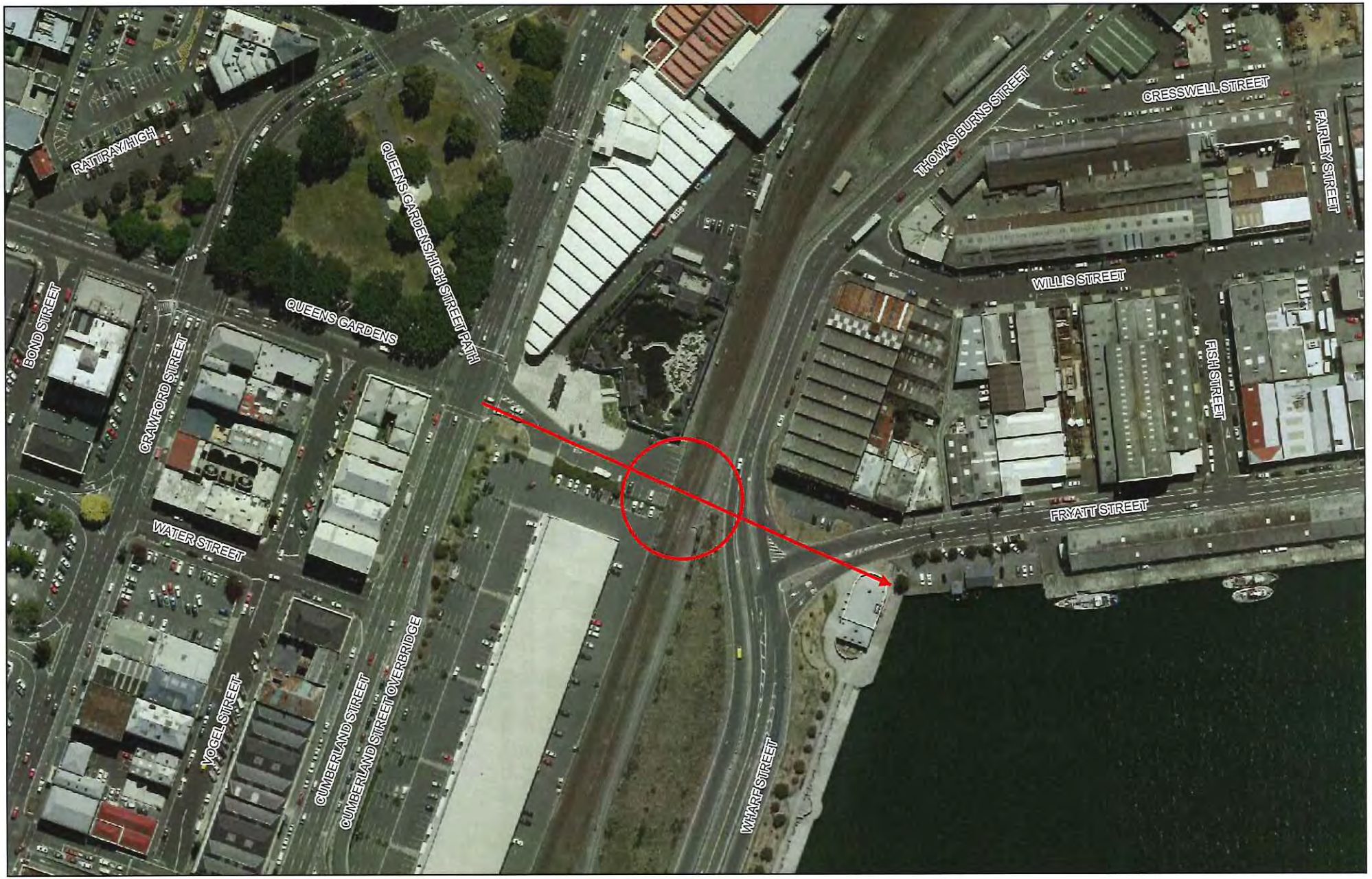
We were advised that KiwiRail's policy is not to reopen crossings which have been closed. While we understand the safety concerns, because of the difficulties caused by disconnecting the harbourside from the central city, we would like to discuss with you potential options for establishing a secure crossing point for pedestrians and cyclists only.

The Chair of Council's Planning and Regulatory Committee, Councillor David Benson-Pope requests a meeting with you at your earliest convenience please. We would like to explore the potential to implement a creative solution which meets your safety needs and the city's need to re-establish this key connection.

Yours sincerely

Dr Sue Bidrose
Chief Executive Officer

Encl: Aerial photograph



N

DUNEDIN CITY COUNCIL

Rattray Street Rail Crossing - Dunedin

Sacel 1:2000 as A4

0 25 50 100 Meters

▪ Appendix A

Historic Building Registrations

Queen Victoria Statue

Queens Gardens, DUNEDIN

Register Number: 2206

Registration Type: Historic Place - Category II

Region: Otago Region

Date Registered: 2/7/82

City/District Council: Dunedin City Council

Information on this page is correct to the best of the Trust's knowledge. If you have any additional information you would like to share with the Trust, please click here. You may wish to contact the Trust to view our paper records.

Cenotaph

Queens Gardens, DUNEDIN

Register Number: 2221

Registration Type: Historic Place - Category II

Region: Otago Region

Date Registered: 2/7/82

City/District Council: Dunedin City Council

Information on this page is correct to the best of the Trust's knowledge. If you have any additional information you would like to share with the Trust, please click here. You may wish to contact the Trust to view our paper records.

Stewart's Transport Ltd Building (Formerly NZ Loan & Mercantile Agency Co Ltd Building)

Corner, Thomas Burns Street and Fryatt Street, DUNEDIN

Register Number: 4755

Registration Type: Historic Place - Category II

Region: Otago Region

Date Registered: 25/9/86

City/District Council: Dunedin City Council

Information on this page is correct to the best of the Trust's knowledge. If you have any additional information you would like to share with the Trust, please click here. You may wish to contact the Trust to view our paper records.

Airport House (former Phoenix House)

114-116 Rattray Street, DUNEDIN

Register Number: 4751

Registration Type: Historic Place - Category I

Region: Otago Region

Date Registered: 19/4/90

City/District Council: Dunedin City Council

Information on this page is correct to the best of the Trust's knowledge. If you have any additional information you would like to share with the Trust, please click here. You may wish to contact the Trust to view our paper records.

Cossens & Black Ltd Building (O.H.B.)

Corner, Wharfe and Fryatt Sts, DUNEDIN

Register Number: 4757

Registration Type: Historic Place - Category II

Region: Otago Region

Date Registered: 25/9/86

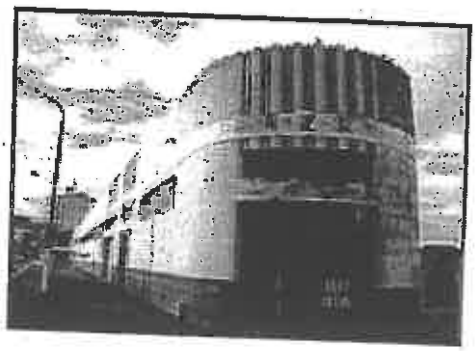
City/District Council: Dunedin City Council

Other Names: Otago Harbour Board Office

Information on this page is correct to the best of the Trust's knowledge. If you have any additional information you would like to share with the Trust, please click here. You may wish to contact the Trust to view our paper records.

N.Z.R. Road Services Building (Former)

35 Queens Gardens, DUNEDIN



Register Number: 3376

Registration Type: Historic Place - Category I

Region: Otago Region

Date Registered: 27/7/88

City/District Council: Dunedin City Council

Information on this page is correct to the best of the Trust's knowledge. If you have any additional information you would like to share with the Trust, please click here. You may wish to contact the Trust to view our paper records.

▪ Appendix B

Shunting Survey Results

Rail Corridor Report Summary

Job Title: Rail Corridor Survey - Fryatt Street
Client Ref: 491-105783 Thomas Burns Street
Client: DCC Transportation Planning Wharf Street
Attention: Don Hill Lower Rattray Street

Report No.: 20040187
Report Date: 04-Apr-04

Day	Date	Total Shunts	Total Shunt Time (hh:mm:ss)	Average Shunt Time (hh:mm:ss)	Total Through Trains	Total Through Time (hh:mm:ss)	Average Through Time (hh:mm:ss)	Total Movements	Total Movement Time (hh:mm:ss)	Average Movement Time (hh:mm:ss)
1	09-Feb	29	0:51:42	0:01:47	25	0:30:57	0:01:14	54	1:22:39	0:01:32
2	10-Feb	50	2:09:03	0:02:35	47	0:52:57	0:01:08	97	3:02:00	0:01:53
3	11-Feb	47	3:48:07	0:04:51	37	0:27:37	0:00:45	84	4:15:44	0:03:03
4	12-Feb	46	2:36:44	0:03:24	25	0:22:07	0:00:53	71	2:58:51	0:02:31
5	13-Feb	62	2:05:10	0:02:01	44	1:02:38	0:01:25	106	3:07:48	0:01:46
6	14-Feb	35	1:55:54	0:03:19	13	0:23:36	0:01:49	48	2:19:30	0:02:54
7	15-Feb	13	6:58:20	0:32:11	10	0:06:17	0:00:38	23	7:04:37	0:18:28
8	16-Feb	31	1:26:15	0:02:47	35	0:32:27	0:00:56	66	1:58:42	0:01:48
9	17-Feb	54	3:38:19	0:04:03	34	0:27:15	0:00:48	88	4:05:34	0:02:47
10	18-Feb	58	5:11:19	0:05:22	25	0:26:54	0:01:05	83	5:38:13	0:04:04
11	19-Feb	54	1:58:02	0:02:11	40	0:49:40	0:01:15	94	2:47:42	0:01:47
12	20-Feb	62	4:29:12	0:04:21	28	0:32:02	0:01:09	90	5:01:14	0:03:21
13	21-Feb	27	11:28:04	0:25:29	16	0:18:44	0:01:10	43	11:46:48	0:16:26
14	22-Feb	12	0:58:27	0:04:52	15	0:16:58	0:01:08	27	1:15:25	0:02:48
15	23-Feb	6	0:30:25	0:05:04	9	0:07:23	0:00:49	15	0:37:48	0:02:31
Survey Period		**586**	**50:05:03**	**0:06:57**	**403**	**7:17:32**	**0:01:05**	**989**	**57:22:35**	**0:04:31**
24hr Averages		**41.86**	**3:34:39**	**0:05:08**	**28.79**	**0:31:15**	**0:01:05**	**70.64**	**4:05:54**	**0:03:29**

Notes:

1. Days 1 and 15 are partial days only.
2. A "Shunt" has been defined as any train that stops or changes direction within the survey area.
3. A "Through" train has been defined as any train that enters the survey area from one direction and exits in the other direction without stopping.
4. Times are taken as the time at which the first locomotive or carriage enters the survey area or the time at which the last carriage leaves the survey area.

▪ Appendix C

Schematic Designs

Drawing Plotted: 01 Dec 2016 12:57

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
A	FOR INFORMATION ONLY	DKM			13.11.16

Drawing Originator: BECA Engineers = Planners = Managers

Original Scale (A1) 1:2000
Reduced Scale (A3) 1:4000

Design	MF	13.11.06	Approved For Construction*
Drawn	DKM	13.11.06	
Dsg Verifier			
Dwg Check			Date

* Refer to Revision 1 for Original Signature

Client: DUNEDIN CITY COUNCIL

Project: RATTRAY ST CROSSING PFR

Title: RELOCATION OF SHUNTING YARDS BLANKET BAY

Discipline: CIVIL

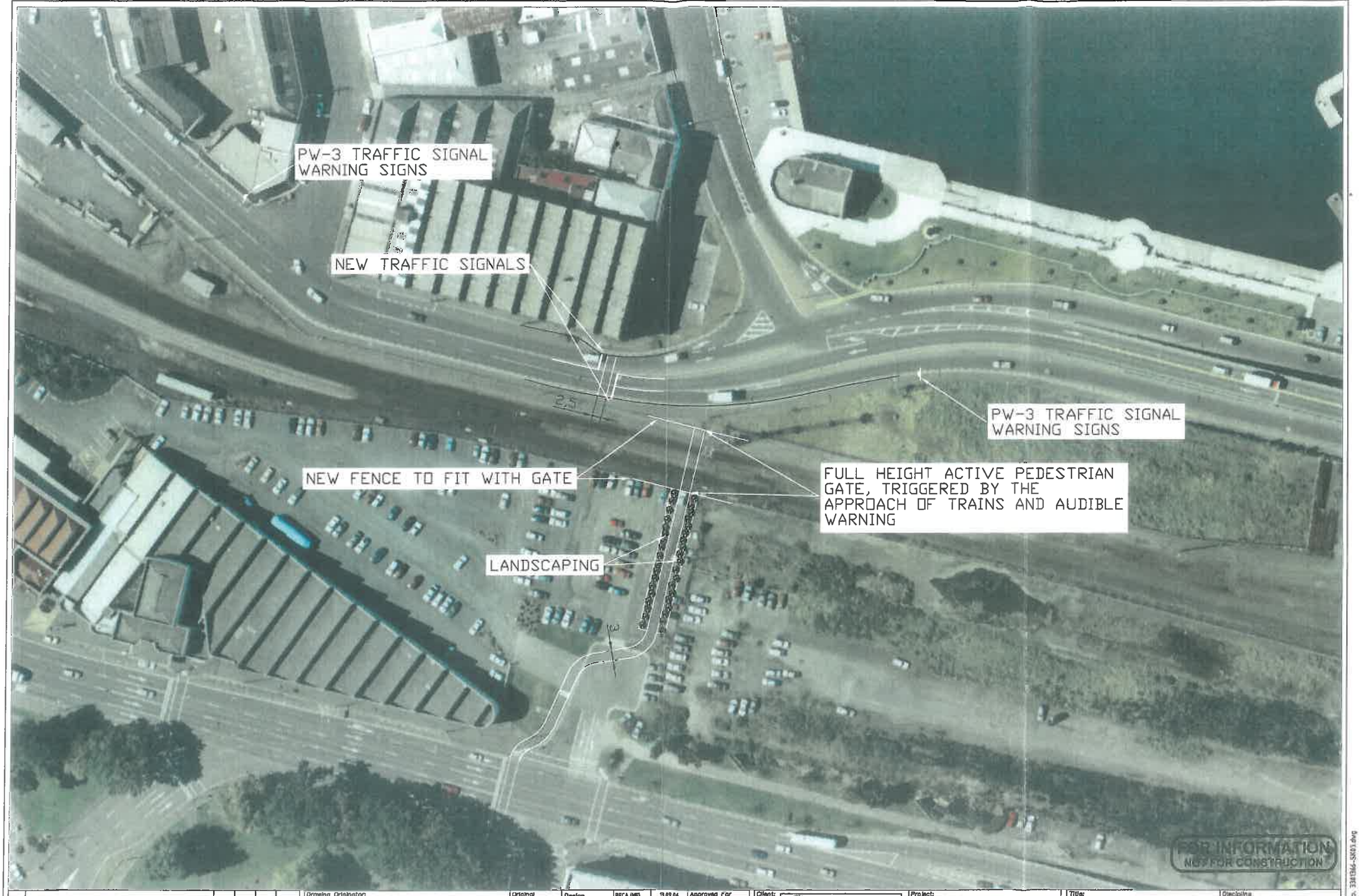
Drawing No.: 3381366-SK02

Rev.: A

DO NOT SCALE

Document No. 3381366-SK02.dwg

Drawing Plotted: 04 Dec 2006 16:01



No.	Revision	By	Chk	Appd	Date
A	FOR INFORMATION	DKM			

Drawing Originator:
BECA Engineers ▪ Planners ▪ Managers

Original Scale (A3): 1:100

Design	BECA (MF)	13.09.06	Approved For Construction*
Drawn	DKM	13.09.06	
Dsg Verifier			
Dwg Check			Date

* Refer to Revision 1 for Original Signature

DO NOT SCALE

Client: DUNEDIN CITY COUNCIL

Project: RATTRAY ST PEDESTRIAN CROSSING SCHEMATIC DESIGN

Title: RATTRAY ST OPTION 2.2

Discipline: CIVIL

Drawing No.: 3381366-SK03

Rev.: A

IF IN DOUBT ASK.

Document No. 3381366-SK03.dwg

Drawing Plotted: 13 Sep 2006 12:14

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
A	FOR INFORMATION	DKH			

Drawing Originator: beca Engineers = Planners = Managers

Original Scale (A3): 1:100

Design	BECA DKH	13.09.06	Approved For Construction*
Drawn	DKH	13.09.06	
Dwg Verifier			
Dwg Check			Date

* Refer to Revision 1 for Original Signature

Client: DUNEDIN CITY COUNCIL

Project: RATTRAY ST PEDESTRIAN OVERBRIDGE SCHEMATIC DESIGN

Title: RATTRAY ST OPTION 2.1

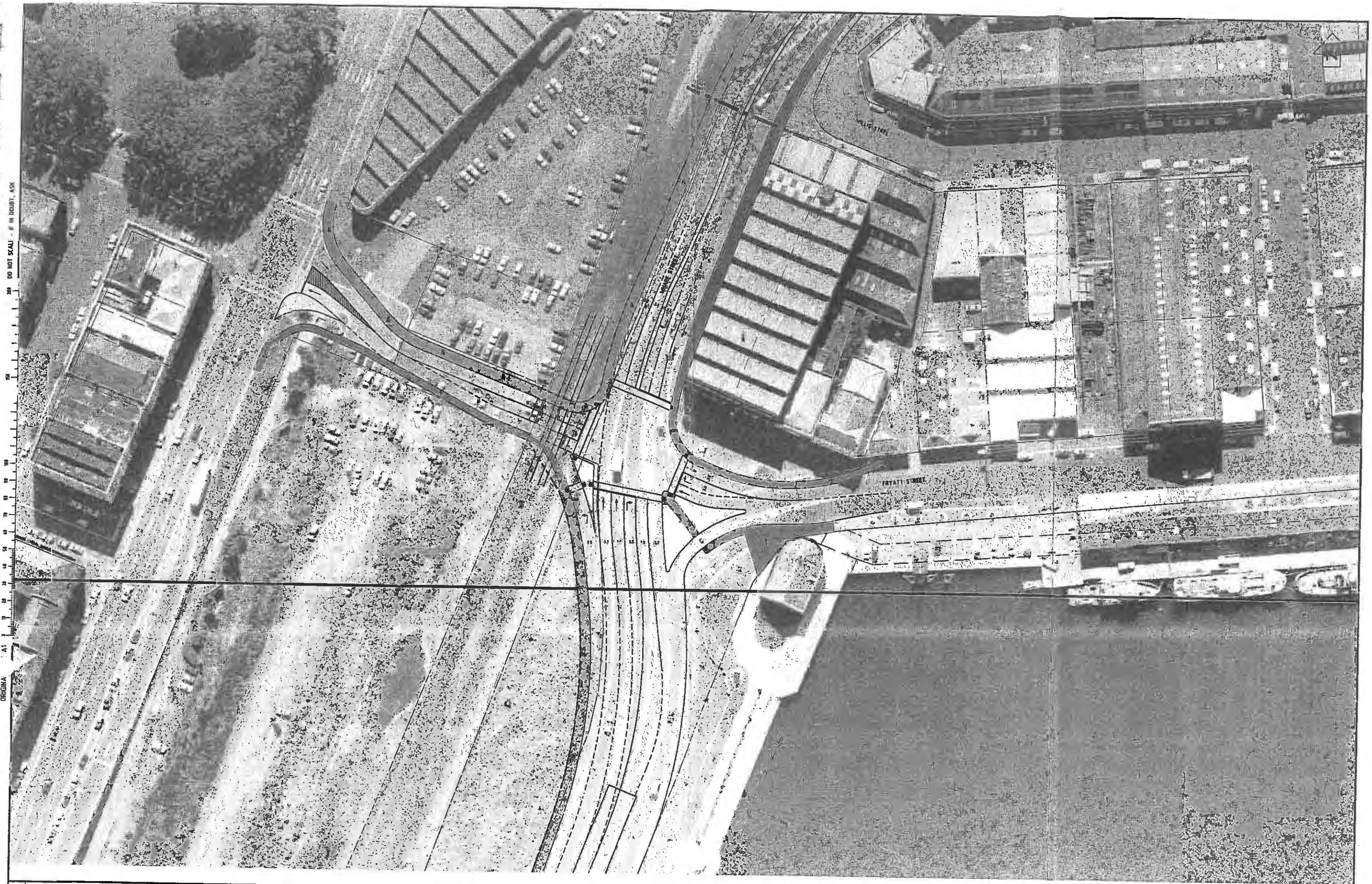
Disciplines: CIVIL

Drawing No.: 3381366

Rev.: A

DO NOT SCALE

IF IN DOUBT ASK.



NOT FOR CONSTRUCTION

REV	AMENDMENTS	INITIAL	DATE	INITIAL	DATE
		CHECKED		APPROVED	

TAB/DWG : Layout
SERVER : DUNEDIN (N2OUN1GEN1)
XREFS :

FIELDBOOK	Name	Date
SURVEYED		
DESIGNED	NK ARCHER	08/05
DRAWN	NK Archer	10/05
CHECKED	MJ RAY	10/05
APPROVED	MJ RAY	10/05

MWH

DUNEDIN CITY COUNCIL

STRATEGIC CORRIDOR

RATTRAY STREET - FRYATT STREET LINK

Status Stamp	CONCEPTUAL
Date Stamp	03-10-2005
SCALES (A1) 1:500 (A3) 1:1000	
Job No. 011390 03	Sheet No. 02
Rev.	A

P:\801011000-\801011390 Strategic Corridor\CONCEPT DESIGNS\0110390.03 02.dwg

Appendix D

Cost Estimates

Projects : RATTRAY ST CROSSING PFR - OPTION 1

Concept Budget Costs (+/- 30%)

Company : BECA
Date: 16/11/2006
Job Nr: 3381366/100

DRAFT

Basis:

Summary:

Rev-1

CO	SECTION NAME	UNIT	QTY	RATE	BASE COST	CONTINGECY COST
	Blanket Bay - Reclamation for Relocation of Shunting Yards					
	Enabling Works:				6,250,000.00	8,725,000.00
	Excavation:				13,000,000.00	17,900,000.00
	Fill:				28,750,000.00	41,312,500.00
	Buildings & Surface Finsh:				13,000,000.00	16,900,000.00
	Miscellaneous Items:				2,160,000.00	2,808,000.00
	SH1 Road Alterations				3,000,000.00	4,350,000.00
	Subtotal				66,160,000.00	91,995,500.00
	Preliminary & General	15.00%			9,924,000.00	13,799,325.00
	Engineering / Professional Fees	10.00%			6,616,000.00	9,199,550.00
	Resource Consent				198,480.00	258,024.00
	TOTAL (Excl GST)				**82,898,480.00**	**115,252,399.00**
	Rattray St - Fryatt Street Link					
	General				100,000.00	130,000.00
	Demolition / Removal				77,750.00	106,600.00
	Earthworks				49,500.00	65,850.00
	Drainage				32,500.00	48,750.00
	Pavement Construction				367,550.00	484,377.50
	Pavement Markings				82,000.00	106,600.00
	Traffic Signals				180,000.00	253,500.00
	Miscellaneous				458,865.00	664,297.50
	Subtotal				1,348,165.00	1,859,975.00
	Preliminary & General	15.00%			202,224.75	278,996.25
	Engineering / Professional Fees	10.00%			134,816.50	185,997.50
	Consents	2.50%			33,704.13	46,499.38
					1,718,910.38	**2,371,468.13**

Exclusions

As per detailed breakdown

Assumtions

As per detailed breakdown

Projects : RATTRAY ST CROSSING PFR - OPTION 1 | Company : BECA | **DRAFT**

Concept Budget Costs (+/- 30%) | Date: 15-Nov-06 | Project Nr: 3381366/100

Basis: Sketch Dwg: Relocation of Shunting Yards to Blanket Bay - 3381366-SK02(A) & Verbal Discussions

Workings:

CO	SECTION NAME		UNIT	QTY	RATE	COST (Rev-1)	BASE TOTALS	Contingency	Cost	CONTINGENCY TOTALS
	Blanket Bay - Reclamation for Relocation of Shunting Yards									
	Enabling Works:									
	Steel Sheet Piling Retaining Wall - Along edge of courseway		m2	5,000.00	1,200	6,000,000.00		40.00%	8,400,000.00	
	Pump Seawater out of area		days	100.00	2,500	250,000.00		30.00%	325,000.00	
							6,250,000.00			8,725,000.00
	Excavation:									
	Excavate of undercut of seabed (stockpiled)		m3	200,000.00	50	10,000,000.00		40.00%	14,000,000.00	
	EO Excavate additional soft spots (% of area)		m3	50,000.00	50	2,500,000.00		30.00%	3,250,000.00	
	Trim Surrounding bays / Courseway edges		m3	10,000.00	50	500,000.00		30.00%	650,000.00	
							13,000,000.00			17,900,000.00
	Fill:									
	Rock fill to entire area - compacted		m3	1,050,000.00	25	26,250,000.00		45.00%	38,062,500.00	
	Allow 500mm Hard fill compacted to surface area		m3	100,000.00	25	2,500,000.00		30.00%	3,250,000.00	
							28,750,000.00			41,312,500.00
	Buildings & Surface Finsh:									
	Ashpalt Surfacing		m2	20,000.00	50	1,000,000.00		30.00%	1,300,000.00	
	Concrete Surfacing		m2	0.00	200	0.00		30.00%	0.00	
	Buildings - Warehouse Construction		m2	7,500.00	1,200	9,000,000.00		30.00%	11,700,000.00	
	Laying Exisitng Rail Track		m	15,000.00	200	3,000,000.00		30.00%	3,900,000.00	
							13,000,000.00			16,900,000.00
	Miscellaneous Items:									
	New Turntable		Item	1.00	500,000	500,000.00		30.00%	650,000.00	
	Signaling		Item	1.00	1,000,000	1,000,000.00		30.00%	1,300,000.00	
	Light Towers	say	Nr	1.00	400,000	400,000.00		30.00%	520,000.00	
	Fueling Tanks	say	Nr	1.00	10,000	10,000.00		30.00%	13,000.00	
	Wind Buffer (Timber Fence)		m	500.00	100	50,000.00		30.00%	65,000.00	
	Compound Fencing		m	2,000.00	100	200,000.00		30.00%	260,000.00	
							2,160,000.00			2,808,000.00
	SH1 Road Alterations									
	Re-Allgmment of SH1		m2	6,000.00	500	3,000,000.00		45.00%	4,350,000.00	
							3,000,000.00			4,350,000.00
	Subtotal					66,160,000.00	66,160,000.00		91,995,500.00	91,995,500.00
	Preliminary & General		Item		15.00%		9,924,000.00			13,799,325.00
	Engineering / Professional Fees		Item		10.00%		6,616,000.00			9,199,550.00
	Resource Consent		Item		0.30%		198,480.00	30.00%	258,024.00	258,024.00
	TOTAL (Excl GST)						82,898,480.00			115,252,399.00

Exclusions

At Concept Stage - To numerous to note — Diff 32,353,919.00

Assumtions

Total area to be reclaimed	m2	200,000.00
Avg Depth to sea bed	m	4
Avg Depth of undercut	m	1
Avg Depth of Soft Spots	m	1
% of Soft Spots to total area		25.00%
Perimeter of reclamation	m	2500.00
Avg Depth of Edge Trimming	m	2
Avg width of Trimming	m	2
Depth of top layer of hardfill	m	0.5

Surface Area Split:

No surface Finish	48.75%	97,500.00 m2
Asphlat	10.00%	20,000.00 m2
Concrete pad	0.00%	0.00 m2
Buildings (1,000m2 Staff Dept & 6,500m2 Wagon Maint')	3.75%	7,500.00 m2
Roading (Shunting Yard)	37.50%	75,000.00 m2
	100.00%	200,000.00 m2

Wind Buffer Height	m	3.00
Wind Buffer Length	m	500.00

Compound Fencing:

Staff Dept Building	m	100.00
Maintenance Shed Building	m	450.00
Road fencing	m	1,200.00
Misc Fencing	m	250.00
		2,000.00

Existing Rd Alterations

Length of SH1	m	600.00
Width of SH1	m	10.00

Projects : RATTRAY ST CROSSING PFR - OPTION 1 | Company : BECA | **DRAFT**

Concept Budget Costs (+/- 30%) | Date: 15-Nov-06 | Project Nr: 3381365/100

Basis: Sketch Dwg: Relocation of Shunting Yards to Blanket Bay - 3381366-SK02(A) & Verbal Discussions

Workings:

CO	SECTION NAME		UNIT	QTY	RATE	Rev-1 COST	BASE TOTALS	Contingency	Cost	CONTINGENCY TOTALS
	Estimating Notes									
1	Area of Reclamation:									
	Behind causeway	m2	850	120.00	1	102,000.00				
		m2	160	120.00	1	9,600.00				
	Southern End Bay	m2	220	160.00	1	35,200.00				
		m2	100	80.00	1	4,000.00				
		m2	100	80.00	1	4,000.00				
		m2	100	80.00	1	4,000.00				
		m2	180	160.00	1	16,200.00				
	Northen End Bay	m2	280	140.00	1	19,600.00				
						194,600.00				
					say	200,000.00				

Projects : RATTRAY ST CROSSING PFR - OPTION 1

oncept Budget Costs (+/- 30%)

Company : BECA
Date: 16/11/2006
Job Nr: 3381366/100

DRAFT

Basis: Sketch Dwg: Strategic Corridor - 01139003 02 (A)

Workings:

Rev-1

O	SECTION NAME	UNIT	QTY	RATE	COST	TOTALS	Contingency	Cost	CONTINGENCY TOTALS
	Rattray St - Fryatt Street Link								
	General								
	Traffic Management	PS	1	90,000.00	90,000.00		30.00%	117,000.00	
	Mobilisation	PS	1	10,000.00	10,000.00		30.00%	13,000.00	
						100,000.00			130,000.00
	Demolition / Removal								
	Removal of existing kerb & Channels	m	400	25.00	10,000.00		30.00%	13,000.00	
	Removal of Existing Islands	m2	250	50.00	12,500.00		30.00%	16,250.00	
	Breakup of existing carpark Asphalt	m2	2350	15.00	35,250.00		40.00%	49,350.00	
	Removal of existing footpaths	m2	1000	20.00	20,000.00		40.00%	28,000.00	
						77,750.00			106,600.00
	Earthworks								
	Site Clearance	m2	2500	5.00	12,500.00		30.00%	16,250.00	
	Strip Topsoil to Waste to new road area (100mm)	m3	250	25.00	6,250.00		30.00%	8,125.00	
	Cut to Waste to new road area (300 deep)	m3	500	30.00	15,000.00		40.00%	21,000.00	
	Import & Compact Fill to new road area (150 deep)	m3	250	35.00	8,750.00		30.00%	11,375.00	
	Excavation for new footpath (200 deep)	m3	200	35.00	7,000.00		30.00%	9,100.00	
						49,500.00			65,850.00
	Drainage								
	Re-align Sumps & Grates	nr	15	1,500.00	22,500.00		50.00%	33,750.00	
	Stormwater Drainage Alterations (Provisional)	PS	1	10,000.00	10,000.00		50.00%	15,000.00	
						32,500.00			48,750.00
	Pavement Construction								
	Kerb &Channel	m	750	45.00	33,750.00		30.00%	43,875.00	
	New Island Kerbing	m	200	50.00	10,000.00		30.00%	13,000.00	
	Cobble Stone paving to Islands - incl basecourse (25% of Island)	m2	60	100.00	6,000.00		30.00%	7,800.00	
	Concrete Infill to Islands - incl base course	m2	265	95.00	25,175.00		30.00%	32,727.50	
	Subgrade preperation to new road	m2	2500	1.50	3,750.00		30.00%	4,875.00	
	Saw Cut and Tie into existing pavement	LS	1	2,500.00	2,500.00		30.00%	3,250.00	
	AP65 Sub basecourse (300mm)	m3	750	45.00	33,750.00		40.00%	47,250.00	
	AP40 Basecourse (150mm)	m3	375	85.00	31,875.00		40.00%	44,625.00	
	Scarify & Remove Existing Seal to waste on existing road	m2	4600	5.00	23,000.00		30.00%	29,900.00	
	40mm Stone Mastic Asphalt to new road (including single coat grade 4 chipseal)	m2	2500	25.00	62,500.00		30.00%	81,250.00	
	40mm Stone Mastic Asphalt to overlay existing road (including single coat grade 4 chipseal)	m2	4600	20.00	92,000.00		30.00%	119,600.00	
	Undercut subgrade (Provisonal) (say 25% of new road 150mm deep)	m3	100	70.00	7,000.00		30.00%	9,100.00	
	Footpath construction basecourse AP20 (150mm)	m3	250	45.00	11,250.00		30.00%	14,625.00	
	Asphalt to footpath Mix 10 (25mm)	m2	1250	20.00	25,000.00		30.00%	32,500.00	
						367,550.00			484,377.50
	Pavement Markings								
	Remove existing road markings (side rds)	LS	1	5,000.00	5,000.00		30.00%	6,500.00	
	Rasied Refectories Markers (RRPM) - (1m crs on each lane line)	Nr	1350	25.00	33,750.00		30.00%	43,875.00	
	Kerb Markers (KTM) (800mm crs)	Nr	330	25.00	8,250.00		30.00%	10,725.00	
	Signs (Provisonal)	PS	1	35,000.00	35,000.00		30.00%	45,500.00	
						82,000.00			106,600.00
	Traffic Signals								
	Poles (avg cost for all works per pole)	nr	11	15,000.00	165,000.00		40.00%	231,000.00	
	Links to rail network	PS	1	5,000.00	5,000.00		50.00%	7,500.00	
	Traffic Management	PS	1	10,000.00	10,000.00		50.00%	15,000.00	
						180,000.00			253,500.00
	Miscellaneous								
	Relocation & New Street Lights (Provisional)	PS	1	25,000.00	25,000.00		40.00%	35,000.00	

Projects : RATTRAY ST CROSSING PFR - OPTION 1

Company : BECA
Date: 16/11/2006
Job Nr: 3381366/100

DRAFT

Concept Budget Costs (+/- 30%)

Basis: Sketch Dwg: Strategic Corridor - 01139003 02 (A)

Workings:

CO	SECTION NAME	UNIT	QTY	RATE	COST	Rev-1 TOTALS	Contingency	Cost	CONTINGENCY TOTALS
	Services Protection & Relocation (Provisional)	PS	1	50,000.00	50,000.00		50.00%	75,000.00	
	Rail Track H&S working proximity uplift (Provsional - say 5%)	PS	527,300.00	5.00%	26,365.00		50.00%	39,547.50	
	Chainlink fence along carpark boundary & new road (2m high)	m	450	150.00	67,500.00		30.00%	87,750.00	
	Allowance for landscaping surrounding area (Provisonal)	m2	1600	25.00	40,000.00		30.00%	52,000.00	
	Allowance for works to train line crossing & connections (Provisonal)	PS	1	250,000.00	250,000.00		50.00%	375,000.00	
						458,865.00			664,297.50
	Subtotal					1,348,185.00			1,859,975.00
	Preliminary & General		item		15.00%	202,224.75			278,996.25
	Engineering / Professional Fees		item		10.00%	134,818.50			185,997.50
	Consents		Item		2.50%	33,704.13			46,499.38
	TOTAL (Excl GST)					1,718,910.38			2,371,468.13

Exclusions

Assumtions

rojects : RATTRAY ST - AT GRADE PEDRESTRIAN CROSSING

Company : BECA
Date: 1/12/2006
Job Nr: 3381366/100

DRAFT

:oncept Budget Costs (+/- 30%)

Basis: Marked up Photo

Summary:

Rev-1

CO	SECTION NAME	UNIT	QTY	RATE	BASE COST	CONTINGECY COST
	Rattray St - Fryatt Street Pedestrian Link					
	General				5,000.00	6,500.00
	Demolition / Removal				11,450.00	15,905.00
	Earthworks				7,875.00	10,777.50
	Drainage				5,000.00	7,500.00
	Footpath Construction				43,250.00	56,225.00
	Pavement Markings & Signs				10,000.00	13,000.00
	Pedestrian Traffic Signals				50,000.00	71,000.00
	Miscellaneous				176,878.75	233,618.13
	Subtotal				309,453.75	414,525.63
	Preliminary & General	15.00%			46,418.06	62,178.84
	Engineering / Professional Fees	10.00%			30,945.38	41,452.56
	Consents	2.50%			7,736.34	10,363.14
					394,553.53	**528,520.17**

Exclusions

As per detailed breakdown

Assumtions

As per detailed breakdown

Projects : RATTRAY ST - AT GRADE PEDESTRIAN CROSSING

Company : BECA

DRAFT

Date: 1/12/2006

Concept Budget Costs (+/- 30%)

Job Nr: 3381366/100

Basis: Marked up Photo

Workings:

Rev-1

CO	SECTION NAME	UNIT	QTY	RATE	COST	TOTALS	Contingency	Cost	CONTINGENCY TOTALS
	Rattray St - Fryatt Street Pedestrian Link								
	General								
	Mobilisation	PS	1	5,000.00	5,000.00		30.00%	6,500.00	
						5,000.00			**6,500.00**
	Demolition / Removal								
	Removal of existing kerb & Channels (provisional)	m	50	25.00	1,250.00		30.00%	1,625.00	
	Breakup of existing carpark Asphalt (100m long)	m2	600	15.00	9,000.00		40.00%	12,600.00	
	Removal of existing footpaths (10m at each end)	m2	60	20.00	1,200.00		40.00%	1,680.00	
						11,450.00			**15,905.00**
	Earthworks								
	Site Clearance (general allowance)	m2	600	1.50	900.00		30.00%	1,170.00	
	Cut to Waste for new footpath (300 deep - total area incl landscape side	m3	180	30.00	5,400.00		40.00%	7,560.00	
	Import & Compact Fill to new footpath area (150 deep)	m3	45	35.00	1,575.00		30.00%	2,047.50	
						7,875.00			**10,777.50**
	Drainage								
	Drainage along footpath (Provisional)	PS	1	5,000.00	5,000.00		50.00%	7,500.00	
						5,000.00			**7,500.00**
	Footpath Construction								
	Kerb (both sides 100m long)	m	200	25.00	5,000.00		30.00%	6,500.00	
	Footpath construction basecourse AP20 (150mm)	m3	45	50.00	2,250.00		30.00%	2,925.00	
	Footpath lighting (overy 10m)	no	10	3,000.00	30,000.00		30.00%	39,000.00	
	Asphalt to footpath Mix 10 (25mm)	m2	300	20.00	6,000.00		30.00%	7,800.00	
						43,250.00			**56,225.00**
	Pavement Markings & Signs								
	Footpath markings (Provisional)	PS	1	2,500.00	2,500.00		30.00%	3,250.00	
	Road markings to crossing (provisonal)	PS	1	2,500.00	2,500.00		30.00%	3,250.00	
	Signs (Provisonal)	PS	1	5,000.00	5,000.00		30.00%	6,500.00	
						10,000.00			**13,000.00**
	Pedestrian Traffic Signals								
	Poles (avg cost for all works per pole)	nr	2	20,000.00	40,000.00		40.00%	56,000.00	
	Traffic Management (provisonal)	PS	1	10,000.00	10,000.00		50.00%	15,000.00	
						50,000.00			**71,000.00**
	Miscellaneous								
	Services Protection & Relocation (Provisional)	PS	1	5,000.00	5,000.00		50.00%	7,500.00	
	Rail Track H&S working proximity uplift (Provsional - say 5%)	PS	67,575.00	5.00%	3,378.75		50.00%	5,068.13	
	EO to form footpath over rail tracks	PS	1	10,000.00	10,000.00		50.00%	15,000.00	
	Chainlink fence along carpark boundary & new road (2m high)	m	280	100.00	28,000.00		30.00%	36,400.00	
	Top soil to landscape areas (150 deep - each side of footpath 3m wide)	m3	45	100.00	4,500.00		30.00%	5,850.00	
	Allowance for landscaping planting to surrounding area (Provisonal)	m2	300	20.00	6,000.00		30.00%	7,800.00	
	Full height active pedestrian gate triggered by train incl wiring	PS	1	150,000.00	120,000.00		30.00%	156,000.00	
						176,878.75			**233,618.13**
	Subtotal					**309,453.75**			**414,525.63**
	Preliminary & General	item			15.00%	**46,418.06**			**62,178.84**
	Engineering / Professional Fees	item			10.00%	**30,945.38**			**41,452.56**
	Consents	item			2.50%	**7,736.34**			**10,363.14**
	TOTAL (Excl GST)					**394,553.53**			**528,520.17**

Exclusions

Assumtions

Footpath is 3m wide x 100m long with 3m x 50m long each side of landscaping

Rattray Street Options Project Feasibility Report

Option 2.1 - Pedestrian Overbridge

Rough Order Cost Estimate

Item	Description	Unit	Qty	Rate	Cost
1	Main Bridge Span	m^2	137.5	$1,600.00	$220,000.00
2	Stairs x 2	m^2	16.5	$1,500.00	$ 24,750.00
3	Ramp - east side	m^2	146	$1,500.00	$219,000.00
4	Ramp - west side	m^2	156	$1,500.00	$234,000.00
	Total Base Estimate				**$697,750.00**
	Contingency + 30%				$907,075.00
	Contingency - 30%				$488,425.00

Notes:

Main Span - 55m long x 2.5m wide
Stairs - 6.6m long x 2.5m wide
Ramp (east side) - 73m x 2.0m wide
Ramp (west side) - 78m x 2.0m wide

Rate per m^2 from rates used by CCC for Pedestrian overbridges range from 1,000m^2 to 1,600m2
Higher rates used due to location in Heritage area and likely higher cost materials required to fit in with heritage look and likely covered structure to account for blocking to the Chinese Gardens. Also a long spans are required across the rail corridor and road corridor

▪ Appendix E

Economic Evaluation

SP 11 Walking and cycling projects, continued

Summary of analysis of chosen option **Worksheet 1**

Worksheet 1 provides a summary of the economic and project data for the preferred option. Provide a brief description of the problem that the proposal is intended to address. For the do minimum, describe the existing road network affected by the proposal, referring to worksheet 2. Other information on the worksheet is filled in based on the calculations in worksheets 3 through 7.

Proposal name: Rattray Street Crossing Option 2.1 - Pedestrian Overpass

Date entered into **LTP online:** - Your reference (as entered in **LTP online**): -

Location: Dunedin City Base date: 1 July 20 06

Time zero: 1 July 20 07

Date evaluation completed: 4 Dec 06 Evaluation completed by: Melissa Foster

Office/organisation: Beca Infrastructure Ltd Checked by: Shane Turner

1. **Description of the problem** Improvements are planned for harbourside green and there is a lack of crossing options from the city centre across the railcorridor to the harbour area
2. **Option cost - description** Construct a pedestrian Bridge **Cost $** 868,788.00 **A**
3. **Programming information**

Earliest start date	2008/2009	
Construction/establishment period	6	months
Land designation required	(yes) / no	
Other statutory/regulatory requirements	See PFR re	

4. **Data** (only fill in the applicable data)

Existing pedestrian/cycling volumes	0	AADT in 20 ____
Estimated new pedestrian/cyclist volume	500	AADT
Estimated motor vehicle volumes	-	AADT
Estimated motor vehicle speed	-	km/h
Pedestrian/cyclist growth rate	3.0	%
Width available for walking/cycling before	-	m
Width available for walking/cycling after	-	m
Length walked/cycled before works	-	km
Length walked/cycled after works	-	km
Expected reduction in private vehicle travel (if applicable)	-	km per day

SP 11 Walking and cycling projects, continued

Summary of analysis of chosen option, continued **Worksheet 1**

5. **Economic appraisal data**

Benefits

Route improvements: $ _____ **B** × update factor _____ = $ _____ **X**

or

Improvements at hazardous sites: $ 988240 **C** × update factor 1·11 = $ 1,096,950 **Y**

or

Promotion projects: $ _____ **D** × update factor _____ = $ _____ **Z**

$$\text{BCR} = \frac{\text{X, Y or Z}}{\text{A}} \quad \frac{\$1096950}{868,288} = 1.3$$

6. **Is the proposed work identified in a current strategy?** yes/(no)

If yes, provide reference _____

7. **Non-monetised impacts** (yes)/no (if yes, provide description on separate page)

8. **Network impacts:** describe the upstream and downstream impacts.

See PFR for non-monetised & network impacts

9. **Action recommended by analyst:** (proceed with proposal)/put on hold/abandon proposal

10. **Action recommended by controlling authority:** approved/modified _____

Date: _____

SP 11 Walking and cycling projects, continued

Costs of the option **Worksheet 3**

1. **Description of the walking or cycling improvements.**

Construct a Pedestrian overpass

2. **Cost of works/activities**

2.1 Estimated cost of works/activities as per attached estimate sheets

$907,075 × 0.91 = $825438 (a)

2.2 Estimated cost of annual maintenance following works

*$5,000 × 8.57 = $42,850 (b)

* Years 2 to 25 inclusive

2.3 Periodic maintenance costs

Periodic maintenance will be required in the following years:

Year	Type of maintenance	Amount	SPPWF	Present value
			Total $	(c)

3. **Present value of the option** = (a) + (b) + (c) = $868,288 **A**

Enter the present value of the option in position A on item 2 worksheet 1.

SP 11 Walking and cycling projects, continued

Explanation sheet for worksheet 4 **Project benefits for walking projects**

Only one of the following three categories may be used in the evaluation of a project. If a project contains more than one of these categories they must be submitted as separate evaluations. Analysts are required to make realistic estimates of the number of new pedestrians generated by any of these projects.

Projects that combine walking and cycling may claim benefits for both modes but safety issues arising from pedestrian/cycle conflicts must be addressed, and if there are additional accident costs these must be accounted for in the project benefits on worksheet 1.

The basis of the composite health, safety and environmental benefits used in worksheet 4 is described in chapter 8.

Discount factors (DF) for different growth rates for years 2 to 25 inclusive

Pedestrian growth rate	0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%
Discount factor (DF)	8.57	8.95	9.32	9.70	10.07	10.45	10.83	11.20	11.58

SP 11 Walking and cycling projects, continued

Project benefits for walking projects **Worksheet 4**

1. **Health, safety and environment benefits for footpaths and other pedestrian facilities**

1.1 Benefit = number of new pedestrians/day × length of new facility in km × 365 × $0.50

= $_____ (a)

1.2 The project benefits are: (a) × DF

= $_____ (b)

Transfer total (b) to position $_____ **B** on item 5 worksheet 1

2. **Health, safety and environment benefits from improvements at hazardous sites**

(provision of overbridges, underpasses, bridge widening or intersection improvements for pedestrians)

2.1 Benefit = number of new pedestrians/day × 365 × $0.5 500 = $ 91,250 (b)

2.2 The project benefits are: (b) × DF 10.83 = $ 988,240 (c)

Transfer total (c) to position $ 988,240 **C** on item 5 worksheet 1

3. **Health, safety and environment benefits from walking promotional activities**

3.1 Benefit = number of new regular pedestrians generated by promotion × 250 × $0.50

= $_____ (c)

3.2 The project benefits are: (c) × DF

= $_____ (d)

Transfer total (d) to position $_____ **D** on item 5 worksheet 1

SP 11 Walking and cycling projects, continued

Summary of analysis of chosen option **Worksheet 1**

Worksheet 1 provides a summary of the economic and project data for the preferred option. Provide a brief description of the problem that the proposal is intended to address. For the do minimum, describe the existing road network affected by the proposal, referring to worksheet 2. Other information on the worksheet is filled in based on the calculations in worksheets 3 through 7.

Proposal name: Kaitiaia Street Crossing Option 2.2 - At Grade Pedestrian Crossin

Date entered into **LTP online**: – Your reference (as entered in **LTP online**): –

Location: Dunedin City Base date: 1 July 2006

Time zero: 1 July 2007

Date evaluation completed: Dec 06 Evaluation completed by: Melissa Foster

Office/organisation: Beca Infrastructure Ltd Checked by: Shane Turner

1. **Description of the problem** Improvements are planned for harbourside area and there is a lack of crossing options from the city centre across the rail corridor to the harbour area
2. **Option cost - description** Construct an at grade ped Pedestrian crossing with Pedestrian gates **Cost $** $523,800 **A**
3. **Programming information**

Earliest start date	2008/2009	
Construction/establishment period	3	months
Land designation required	(yes) / no	
Other statutory/regulatory requirements	See PFR	

4. **Data** (only fill in the applicable data)

Existing pedestrian/cycling volumes	0	AADT in 20	
Estimated new pedestrian/cyclist volume	500	AADT	
Estimated motor vehicle volumes	–	AADT	← see attached spreadsheet for details of motor vehicle volumes
Estimated motor vehicle speed	–	km/h	
Pedestrian/cyclist growth rate	3.0	%	
Width available for walking/cycling before	–	m	
Width available for walking/cycling after	–	m	
Length walked/cycled before works	–	km	
Length walked/cycled after works	–	km	
Expected reduction in private vehicle travel (if applicable)	–	km per day	

SP 11 Walking and cycling projects, continued

Summary of analysis of chosen option, continued **Worksheet 1**

5. **Economic appraisal data**

Benefits

Route improvements: $ – **B** × update factor – = $ – **X**

or

Improvements at hazardous sites: $ 278,240 **C** × update factor 1.11 = $ 309,050 **Y**

or

~~Promotion projects~~: Travel Time Costs (from attached spreadsheet) $ 345,207 **D** × update factor 1.11 = $ 383,180 **Z**

BCR = X, Y or Z / A = 718,770 / 523,800 = 1.4 ← This BCR is expected to be less than 1.4 if accident risk/costs are taken into consideration for both at the rail crossing and at Thomas Burn Street.

6. **Is the proposed work identified in a current strategy?** yes/no

If yes, provide reference _____

7. **Non-monetised impacts:** (yes)/no (if yes, provide description on separate page)

8. **Network impacts:** describe the upstream and downstream impacts.

See PFR for non-monetised & network impacts

9. **Action recommended by analyst:** proceed with proposal/put on hold/abandon proposal

10. **Action recommended by controlling authority:** approved/modified _____

Date: _____

SP 11 Walking and cycling projects, continued

Explanation sheet for worksheet 3

Costs of the option

Worksheet 3 is used for calculating the PV cost of the cycling or walking works.

1. Calculate the cost of the option, ie investigation, design, construction etc. Attach the estimate sheet to this worksheet. Multiply the costs by the discount factor 0.91 to get the PV.
2. Estimate the cost of annual maintenance following completion of project based on local experience and knowledge. Multiply by 8.57 to get the PV maintenance/update costs.
3. In part 2.3 of worksheet 3 calculate the PV of any periodic maintenance. Enter the years and the amounts in the table.
4. Sum (a) + (b) + (c) to get total $_____A.

Present worth factors — for 10 percent discount rate

Year	SPPWF	Year	SPPWF
1	0.91	14	0.26
2	0.83	15	0.24
3	0.75	16	0.22
4	0.68	17	0.20
5	0.62	18	0.18
6	0.56	19	0.16
7	0.51	20	0.15
8	0.47	21	0.14
9	0.42	22	0.12
10	0.39	23	0.11
11	0.35	24	0.10
12	0.32	25	0.09
13	0.29		

SP 11 Walking and cycling projects, continued

Costs of the option **Worksheet 3**

1. **Description of the walking or cycling improvements.**

Construct an at grade pedestrian crossing

2. **Cost of works/activities**

2.1 Estimated cost of works/activities as per attached estimate sheets

$528,520 × 0.91 = $480,953 (a)

2.2 Estimated cost of annual maintenance following works

*$ 5,000 × 8.57 = $ 42,850 (b)

* Years 2 to 25 inclusive

2.3 Periodic maintenance costs

Periodic maintenance will be required in the following years:

Year	Type of maintenance	Amount	SPPWF	Present value
			Total $	(c)

3. **Present value of the option** = (a) + (b) + (c) = $523,800 **A**

Enter the present value of the option in position A on item 2 worksheet 1.

SP 11 Walking and cycling projects, continued

Explanation sheet for worksheet 4 **Project benefits for walking projects**

Only one of the following three categories may be used in the evaluation of a project. If a project contains more than one of these categories they must be submitted as separate evaluations. Analysts are required to make realistic estimates of the number of new pedestrians generated by any of these projects.

Projects that combine walking and cycling may claim benefits for both modes but safety issues arising from pedestrian/cycle conflicts must be addressed, and if there are additional accident costs these must be accounted for in the project benefits on worksheet 1.

The basis of the composite health, safety and environmental benefits used in worksheet 4 is described in chapter 8.

Discount factors (DF) for different growth rates for years 2 to 25 inclusive

Pedestrian growth rate	0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%
Discount factor (DF)	8.57	8.95	9.32	9.70	10.07	10.45	10.83	11.20	11.58

SP 11 Walking and cycling projects, continued

Project benefits for walking projects **Worksheet 4**

1. **Health, safety and environment benefits for footpaths and other pedestrian facilities**

1.1 Benefit = number of new pedestrians/day × length of new facility in km × 365 × $0.50

= $_____ (a)

1.2 The project benefits are: (a) × DF = $_____ (b)

Transfer total (b) to position $_____ **B** on item 5 worksheet 1

2. **Health, safety and environment benefits from improvements at hazardous sites**

(provision of overbridges, underpasses, bridge widening or intersection improvements for pedestrians)

2.1 Benefit = number of new pedestrians/day × 365 × $0.5 = $ 91 250 (b)

500

2.2 The project benefits are: (b) × DF 10.83 = $ 988240 (c)

Transfer total (c) to position $ 988240 **C** on item 5 worksheet 1

3. **Health, safety and environment benefits from walking promotional activities**

3.1 Benefit = number of new regular pedestrians generated by promotion × 250 × $0.50

= $_____ (c)

3.2 The project benefits are: (c) × DF = $_____ (d)

Transfer total (d) to position $_____ **D** on item 5 worksheet 1

See Attached sheets for Travel Time Costs associated with proposed signalised pedestrian Crossings

SP 11 Walking and cycling projects, continued

Explanation sheet for worksheet 6 **Benefit cost ratio and incremental analysis**

Benefit-cost analysis

1. Under benefits, enter the discounted values of benefits, for each option.
2. Under costs, enter the discounted value for the road authority's capital and maintenance costs for each option.
3. Calculate the benefit cost ratio for each option by dividing the total benefits by the option costs.

Incremental analysis

1. Rank the options in order of increasing cost.
2. Compare the lowest cost option with the next higher cost option to calculate the incremental BCR.
3. If the incremental BCR is less than the target incremental BCR specified in appendix A12 of volume 1, discard the second (higher cost) option in favour of the first. Compare the first option with the next higher cost option.
4. If the incremental BCR is greater than the target incremental BCR, the second (higher cost) option becomes the basis for comparison against the next higher cost option.
5. Repeat the procedure until no higher cost options are available that have an incremental BCR greater than the target incremental BCR.
6. Undertake a sensitivity test using a target incremental BCR that is 1.0 greater than the ratio used in steps 2 to 5 above. Report the results of this sensitivity test in the project report.

SP 11 Walking and cycling projects, continued

Benefit cost ratio and Incremental analysis **Worksheet 6**

Proposal Pedestrian Facility Improvements Time zero 2007 Base date 2006

BCR calculations	Do minimum	Option A	Option B	Option	Option
Benefits		Bridge	At Grade		
~~Route improvements~~		–	–		
Improvements at hazardous sites		1096950	1096950 ~~713770~~		
~~Promotion projects~~ Travel Time Costs			383,180		
Present value total benefits		1096950	713770		
Costs		825,438	480950		
Present value capital costs					
Present value maintenance costs		42850	42850		
Present value total costs					
BCR		8682888	523800		

Base option for comparison			Next higher cost option			Incremental analysis		
Option	Total costs (1)	Total benefits (2)	Option	Total costs (3)	Total benefits (4)	Incremental costs (5) = (3)-(1)	Incremental benefits (6) = (4)-(2)	Incremental BCR (7) = (6)/(5)
B	523800	713770	A	8682888	1096950	344,488	383180	1.1

Rattray Street Crossing - Option 2.2 At Grade Signalised Pedestrian Cros

Travel Time Delay

2011

	AM (1hr flows)	IP (2hr flows)	PM (1hr flows)	
Traffic Flow				
Nbnd + Sbnd combined	2605	2955	4441	2809 veh/hr
Stop Time	240	240	240	240 sec / hr
Traffic Arriving During Stop Time	174	197	296	187 veh
Cross time	20	20	20	20 sec
Average length of time traffic stopped	10	10	10	10 sec
Vehicle hours of delay	0.48	0.55	0.82	0.52 hours
Travel Time Unit Cost	$ 19.01	$ 19.01	$ 21.55	$ 18.75 /hr
Travel Time Delay Cost	$ 9.17	$ 10.40	$ 17.72	$ 9.75
Period factor	1.21	1.21	6.23	1.97
Travel Time Delay total period	$ 11.10	$ 12.59	$ 110.41	$ 19.21
Total Travel Time Delay per day	$ 121.58	$ 142.22		
Total Travel Time Delay per year	$ 40,122.64	$ 46,931.00		

Assumptions:
Traffic Flows from 2011, 2021 and 2031 Tracks Model
The signals will be triggered by pedestrians every 5mins on average
A crossing time of 20sec has been assumed
The time cost is from the PEM Table A4.3 incl congestion cost
330 days used when converting from day to year due to public holidays / week

1 Name of Project: Rattray Street Crossing PFR - Relocation of Shunting Yards

2 Roading Authority:

(a) Territorial Authority (TA): Dunedin City Council

(b) Transit New Zealand Regional Office: Dunedin

3 Evaluator:

(a) Consultant or TA: BIL

(b) Evaluator: Melissa Foster

(c) Checker: Shane Turner

4 Date of Evaluation: 2-Dec-06

COST-BENEFIT ANALYSIS OF THE OPTIONS – Tangible BCR - without land sales included **WORKSHEET 4**

1. Project Options	Do Minimum	Option A				Option A		
COSTS:						Net Costs of the Project Options ($)		
2. Capital Costs		72,161,289				72,161,289		
3. Maintenance Costs	134,159	227,239				93,080		
4. Total Costs (2) + (3)	134,159	72,388,529				72,254,369		
BENEFITS						Net Benefits of the Project Options ($)		
5. Travel Time Costs	3,561,460,314	3,563,346,405				-1,886,091		
6. Vehicle Operating Costs	2,229,065,783	2,228,765,353				300,430		
7. Accident Costs	2,378,406	2,594,745				-216,339		
8. Sale of Extra Land								
9. Carbon Dioxide	111,453,289	111,438,268				15,021		
10. Tangible Benefits (5) to (9)	5,904,357,791					-1,786,979		
11. Tangible B/C Ratio (10)/(4)						-0.025		
12. Ranking B/C Ratio								
13. Intangible Benefits (12) - (11) x (4)								

Note 1.

1. TT & VOC costs are the costs for the entire road network in Dunedin per day, as supplied from the Dunedin Transportation Model for the do minimum option and Option 1 the at-grade road crossing/signalised intersection.

COST-BENEFIT ANALYSIS OF THE OPTIONS – Intangible BCR - with land sales included. **WORKSHEET 4**

1. Project Options	Do Minimum	Option A				Option A		
COSTS:						Net Costs of the Project Options ($)		
2. Capital Costs		72,161,289				72,161,289		
3. Maintenance Costs	134,159	227,239				93,080		
4. Total Costs (2) + (3)	134,159	72,388,529				72,254,369		
BENEFITS						Net Benefits of the Project Options ($)		
5. Travel Time Costs	3,561,460,314	3,563,346,405				-1,886,091		
6. Vehicle Operating Costs	2,229,065,783	2,228,765,353				300,430		
7. Accident Costs	2,378,406	2,594,745				-216,339		
8. Sale of Extra Land		-4,991,629				4,991,629		
9. Carbon Dioxide	111,453,289	111,438,268				15,021		
10. Tangible Benefits (5) to (9)	5,904,357,791					3,204,650		
11. Tangible B/C Ratio (10)/(4)						0.044		
12. Ranking B/C Ratio								
13. Intangible Benefits (12) - (11) x (4)								

note 1

1. TT & VOC costs are the cost for the entire road network in Dunedin per day, as supplied from the Dunedin Transportation Model for the do minimum option and Option 1 the at-grade road crossing/signalised intersection.

ROUTE DATA – SH88 Realignment

WORKSHEET A2.1

Project Option (1)	Road Section / Movement (2)	Length (m) (3)	Description (4)	Traffic Direction (5)	Gradient (6)	Road Surface (7)	Road Roughness (8)
Do Min	1	130	Start of Project to realignment	All	0.00%		80
	2	530	realignment section	All	0.00%		80
	3	130	realignment to end of project	All	0.00%		80
		790					

ROUTE DATA – SH 88 Realignment

WORKSHEET A2.1

Project Option (1)	Road Section / Movement (2)	Length (m) (3)	Description (4)	Traffic Direction (5)	Gradient (6)	Road Surface (7)	Road Roughness (8)
Option A	1	130	Start of Project to realignment	All	0.00%		65
	2	500	realignment section	All	0.00%		65
	3	130	realignment to end of project	All	0.00%		65
		760					

PROJECT EVALUATION SUMMARY SHEET — WORKSHEET 8

1 Project Name: Rattray Street Crossing PFR - Relocation of Shunting Yards

2 Preferred Project Option: A

Project Details

3	Capital Cost of Project (undiscounted)	$117,624,000
4	Cost of Enviromental Mitigation Measures	N/A
5	Earliest Start of Construction	1-Jul-10
6	Construction Period (months)	48

Analysis and Assumptions

7	AADT at Time Zero	4700
8	Traffic Growth Rate (%) at Time Zero	2.0%
9	Average Accident Reduction (%)	30%

Realignme of SH 8

Results of Analysis

10	Tangible B/C Ratio	-0.025
11	Ranking B/C Ratio	N/A
12	FYRR (%)	27%
13	Carbon Dioxide (a) Tonnes/yr change	501
	(b) Value	$15,021
14	Iwi Effects	
15	List Other Major Intangible Effects, (excluding CO_2 and Iwi Effects)	N/A

TRAVEL TIME COSTS – SH 88 Realignment

WORKSHEET A4.1

Option (1)	Road Section / Movement (2)	Time Period (3)	Time Periods per Year (4)	Road Category (5)	Vehicles per Time Period (6)	Total Travel Time (min) (7)	Travel Time Cost ($/hour) (8)	Total Cost / Year ($) (9)
Do Min	1	Days	365	Rural Strategic	4700	0.0975	23.25	$64,814
	2	Days	365	Rural Strategic	4700	0.3975	23.25	$264,241
	3	Days	365	Rural Strategic	4700	0.0975	23.25	$64,814
						0.5925		$393,868
								$393,868

TRAVEL TIME COSTS – SH 88 Realignment

WORKSHEET A4.1

Option (1)	Road Section / Movement (2)	Time Period (3)	Time Periods per Year (4)	Road Category (5)	Vehicles per Time Period (6)	Total Travel Time (min) (7)	Travel Time Cost ($/hour) (8)	Total Cost / Year ($) (9)
Option A	1	Days	365	Rural Strategic	4700	0.0975	23.25	$64,814
	2	Days	365	Rural Strategic	4700	0.3750	23.25	$249,284
	3	Days	365	Rural Strategic	4700	0.0975	23.25	$64,814
						0.5700		$378,911
								$378,911

VEHICLE OPERATING COSTS A – SH 88 Realignment

WORKSHEET A5.1

Option	Section/ Movement	Section Length (m)	Average Gradient (%)	Surface Roughness (counts/km)	Period		Vehicle Type	Section Speed	Base Cost (cents/km)	Roughness Cost (cents/km)	Speed changes and Stops		Queuing Delay		Section Cost (cents)
					From	To					Min Speed (km/h)	Add Cost (cents)	Time (mins per veh)	Fuel (cents)	
(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Do Min	1	130	0.00%	80			All	80	20.5	0.2	-	0	-	0	2.69
	2	530	0.00%	80			All	80	20.5	0.2	-	0	-	0	10.97
	3	130	0.00%	80			All	80	20.5	0.2	-	0	-	0	2.69
OPTION A	1	130	0.00%	65			All	80	20.5	0	-	0	-	0	2.67
	2	500	0.00%	65			All	80	20.5	0	-	0	-	0	10.25
	3	130	0.00%	65			All	80	20.5	0	-	0	-	0	2.67

VEHICLE OPERATING COSTS B -SH 88 Realignment

WORKSHEET A5.2

Option	Section / Movement	Time Units	Period		Time Units Per Year	Vehicle Type	Vehicles per Time Unit	Section Cost (cents)	Total Cost/Yr ($)
			From	To					
(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)	(9)
Do Min	1	DAYS			365	ALL	4700	2.69	46,164
	2	DAYS			365	ALL	4700	10.97	188,208
	3	DAYS			365	ALL	4700	2.69	46,164
								TOTAL	$280,536
OPTION A	1	DAYS			365	ALL	4700	2.67	45,718
	2	DAYS			365	ALL	4700	10.25	175,839
	3	DAYS			365	ALL	4700	2.67	45,718
								TOTAL	$267,275

- Do Minimum Layout

Priority T-Junction Crash Prediction Models

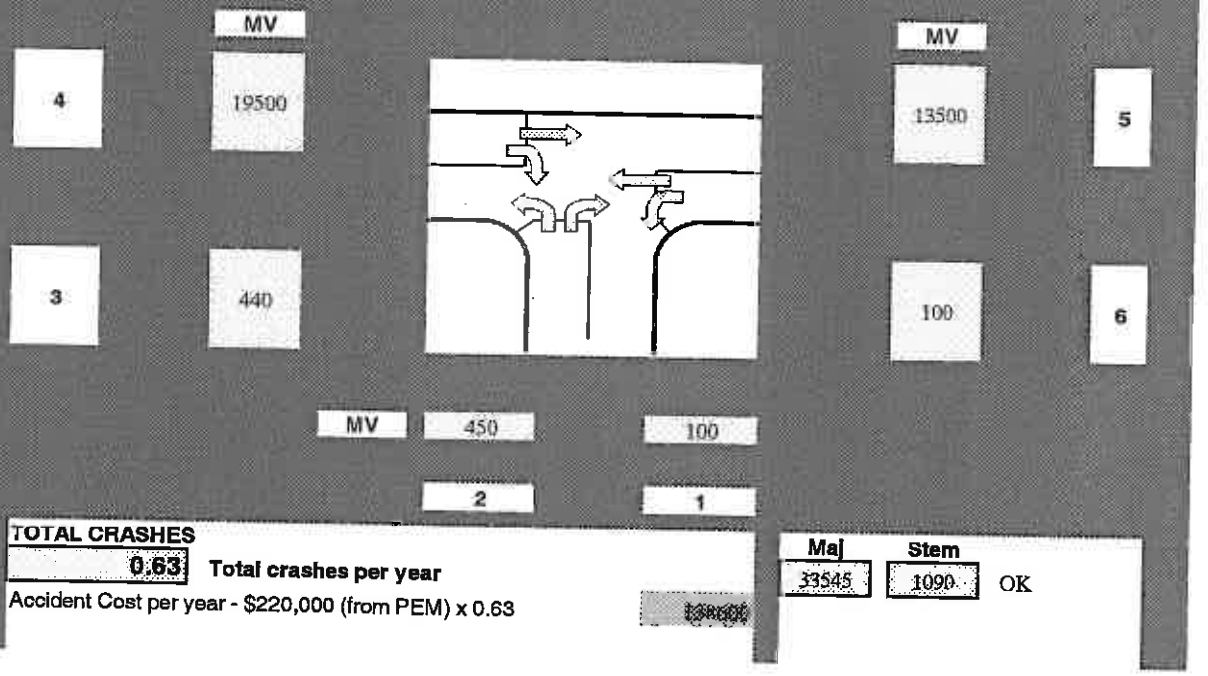
Project: Rattray Street Crossing PFR - Option 1 relocation of Shunting yards

Analysis Year: 2021

Intersection: Thomas Burns Street / Fyratt Street

FLOWS

All flows entered must be entered as average annual daily flows (veh/day) and factored to the analysis year.



TOTAL CRASHES

0.63 **Total crashes per year**

Accident Cost per year - $220,000 (from PEM) x 0.63

Maj	Stem	
33545	1090	OK

Option 1 Layout

Signalised Crossroads Crash Prediction Models

Project: Rattray Street Crossing PFR - Option 1 relocation of Shunting yards

Analysis Year: 2021

Intersection: Thomas Burns Street / Fyratt Street

FLOWS

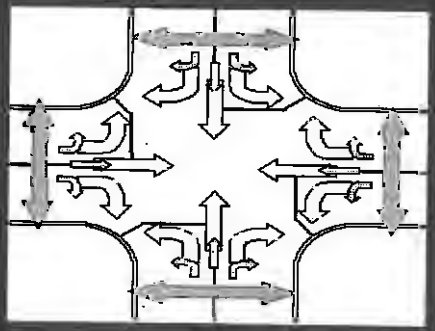
All flows entered must be entered as average annual daily flows (veh/day, cyc/day and ped/day) and factored to the analysis year. Pedestrian flows are the number of pedestrians crossing each approach in either direction.

	1	2	3
Cycles	14	72	72
MV	420	9900	100
Peds		9	

☐ Use Cyclist Counts

☐ Use Pedestrian Counts

Cycles	MV	Peds
12 43	350	9
11 115	480	
10 100	510	



Peds	MV	Cycles
9	100	100 4
	350	72 5
	600	57 6

	1	2	3
Peds		43	
MV	320	15300	1800
Cycles	57	57	172
	9	8	7

TOTAL CRASHES

0.99 Total crashes per year

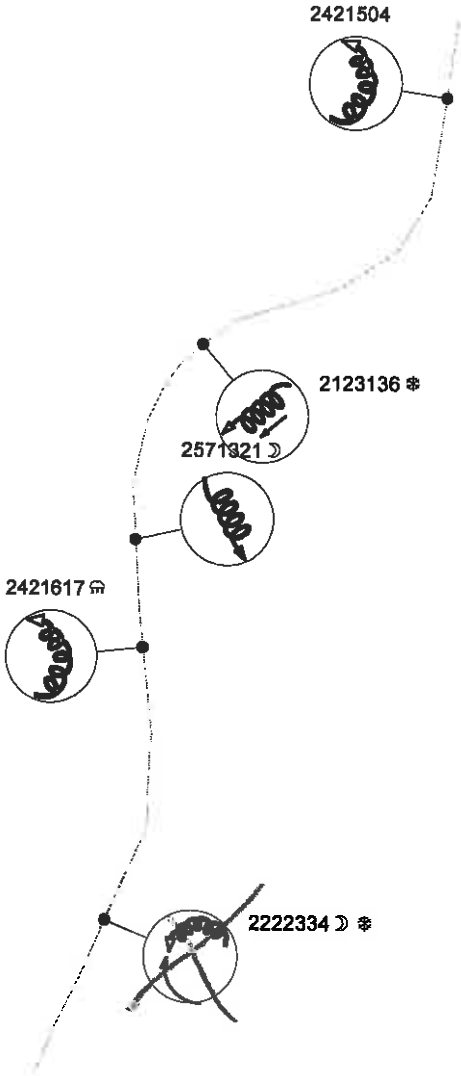
Accident Cost per year - $220,000 (from PEM) x 0.99

217800

Maj	Min	
27300	2930	OK

LAND transport safety AUTHORITY

First Street	D I R	Second street or landmark	Crash Number	Date	Day	Time	M V M	D R VN	VVV	Factors and Roles	O B J E C	C U R V E	W E T N S	L I G H T	W E T H E R	J U N C T	C O N	M A R K	S P D	Total Inj	F A T	S E R	M I N	P E a g e	C Y C a g e
Distance				DD/MM/YYYY	DDD	HHMM	T	1	234	A is for vehicle 1 B is for veh 2 etc	T		S		R		L		T						
~~88/8/0.204~~		~~400S ST LEONARDS DRIVE~~	~~2222334~~	~~05/07/2002~~	~~Fri~~	~~0729~~	~~BF~~	~~CS1C~~		~~135A 802~~															
88/8/0.554		50S ST LEONARDS DRIVE	2421617	18/04/2004	Sun	1140	DB	CN1		131A 358A	P	M	W	O	M		C	080		1					
88/8/0.688		40S BLANKET BAY ROAD	2571321	15/05/2005	Sun	0310	CB	CS1		103A 110A 517A	EZ	R	D	DO	F		C	080							
88/8/0.954		350N ST LEONARDS DRIVE	2123136	03/07/2001	Tue	0815	AD	CS1C		131A 135A 802	Z	M	I	B	F		C	100		1					
88/8/1.428		200S DISTRICT ROAD	2421504	06/02/2004	Fri	1815	DB	CN1		108A	EG	E	D	B	F		C	100		1					


2421504
2123136 ❄
2571921 ☽
2421617 ⛆
2222334 ☽ ❄

ACCIDENT BY ACCIDENT ANALYSIS - DO MINIMUM

Project Name:	Blanket Bay Realignment	Speed Category:	80km/h
Movement Category:	Lost Control Off Road	Mean Speed:	80.0 km/h
Vehicle Involvement:	Car, Van, Other		

DO MINIMUM:	Injury Severity			Non-Injury	Total Cost of Accidents/Year
	Fatal	Serious	Minor		
1 No of Years of TARs	1/01/2001 to 31/12/2005 = 5.0 Years				
2 No of Reported Accidents over Period	0	0	3	1	
3 Proportion of Fatal to Serious (Table A6.10)	0.21	0.79			
4 No of Reported Accidents Adjusted by Severity	0.00	0.00	3.00	1.00	
5 Accidents per Year (4÷1)	0.00	0.00	0.60	0.20	
6 Adjustment Factor (Table A6.1(a))	1.02				
7 Adjusted Accidents per Year (5×6)	0.00	0.00	0.61	0.20	
8 Under-Reporting Factors (Table A6.11)	1.0	2.0	4.0	20.0	
9 Total Estimated Accidents per Year (7×8)	0.00	0.00	2.45	4.08	
10 Accdient Cost, 100 km/h Speed Limit (Table A6.12)	$ 3,200,000	$ 350,000	$ 23,000	$ 2,300	
11 Accident Cost, 50 km/h Speed Limit (Table A6.12)	$ 3,000,000	$ 330,000	$ 19,000	$ 1,500	
12 Mean Speed Adj. = (Do Min Mean Speed - 50) / 50	0.60				
13 Cost per Accident = 11 + (12 × (10-11))	$ 3,120,000	$ 342,000	$ 21,400	$ 1,980	
14 Total accident Cost per Year (9 × 13)	$ 0	$ 0	$ 52,346	$ 8,072	$ 60,418

Total Do Minimum Costs = $ 60,418

ACCIDENT BY ACCIDENT ANALYSIS - PROJECT OPTIONS

WORKSHEET A6.3

Project Name:	Blanket Bay Realignment	Posted Speed Limit:	80km/h
Option Name:	Option A	Road Category:	Rural Mid-Block
Movement Category:	Lost Control Off Road	Vehicle Involvement:	Car, Van, Other

Option Name:Option A		Injury Severity				
OPTION:	Option Mean Speed: 80.0 km/h	Fatal	Serious	Minor	Non-Injury	Total Cost
18 Percentage Accident Reduction		0.0	0.0	30.0	30.0	
19 Predicted Accidents per Year (steps 9 and 18)		0.00	0.00	1.71	2.85	
20 Accident Cost, 100 km/h (Table A6.12)		$ 3,200,000	$ 350,000	$ 23,000	$ 2,300	
21 Accdient Cost, 50 km/h (Table A6.12)		$ 3,000,000	$ 330,000	$ 19,000	$ 1,500	
22 Mean Speed Adjustment = *(Option Mean Speed - 50)/50*		0.60				
23 Cost per Accident = 21 + (22 × (20 - 21))		$ 3,120,000	$ 342,000	$ 21,400	$ 1,980	
24 Total Accident Cost Per Year (19 × 23)		$ 0	$ 0	$ 36,642	$ 5,650	$ 42,293

Total Cost of Option (Option A) = **$42,293**

ACCIDENT PROJECT INPUTS SUMMARY

PROJECT LEVEL INPUTS

Project Name:	Blanket Bay Realignment	Submitted By:	Melissa Foster
Location:	Dunedin	Checked By:	
Date:	03/12/2006	Base Date:	1/07/2006
Office/Organisation:	Beca Infrastructure Ltd	Time Zero:	1/07/2007

Project Traffic

AADT:4,700 at 1/07/2005 equates to 4,888.00 at Time Zero

Growth Rate: 2.00% equates to 1.92% at Time Zero

Site Category:80km/h

Road Category:Rural Mid-Block

Accident History

Accident Period Start Date:1/01/2001 Accident Period End Date:31/12/2005

The Project contains only LTSA recorded Accidents.

The Accident Site Mean Speed is:80.0 km/h

Movement	Vehicle	Fatal	Serious	Minor	NonInjur	Distanc	Comments
Lost Control Off Road, DB	Car, Van, Other	0	0	2	0	0.00	
Lost Control Off Road, CB	Car, Van, Other	0	0	0	1	0.00	
Lost Control Off Road, AD	Car, Van, Other	0	0	1	0	0.00	
		0	**0**	**3**	**1**		

Accident Rate Inputs

Site Category: Rural Mid-Block

Terrain Type:Level (<3% Gradient)

Length:0.390 km

Lane Width:3.50 m

Shoulder Width:1.00 m

Crash Barriers are not present

PROJECT OPTIONS - Accident Reductions

Accident Reductions - Option A

Movement	Vehicle	Fatal	Serious	Minor	Non-Injury
Lost Control Off Road, AD	Car, Van, Other	30 %	30 %	30 %	30 %
Lost Control Off Road, CB	Car, Van, Other	30 %	30 %	30 %	30 %
Lost Control Off Road, DB	Car, Van, Other	30 %	30 %	30 %	30 %

PROJECT OPTIONS - Accident Rate Model/Equation Inputs

Accident Rate Inputs -

Site Category: Urban Intersection

Category Type:

QMajor:

QMinor:

Site Category: Urban Mid-Block

Category Type:

Length: km

Median Type:

Site Category: Rural Intersection

Category Type:

QMajor:

QMinor:

Site Category: Rural Mid-Block

Terrain Type:

Length: km

Lane Width: m

Shoulder Width: m

Site Category: Rural Auxiliary

Terrain Type:

Length: km

Lane Width: m

Shoulder Width: m

Lanes:

Site Category: Bridge

Category Type:

Approach Width: m

Bridge Width: m

Site Category: Rail Crossing

Category Type:

Trains:

Site Category: Isolated Curve

Upstream Approach Speed: km/h

Downstream Approach Speed: km/h

Design Speed: km/h

Rattray Street Crossing - Option 2.2 At Grade Signalised Pedestrian Crossing

Travel Time Delay

2011

	AM (1hr flows)	IP (2hr flows)	PM (1hr flows)	
Traffic Flow				
Nbnd + Sbnd combined	2605	3749	2526	veh/period
Stop Time	240	240	240	sec / hr
Traffic Arriving During Stop Time	174	250	168	veh/hr
Cross time	20	20	20	sec
Average length of time traffic stopped	10	10	10	sec/veh
Vehicle hours of delay	0.48	0.69	0.47	veh.hours
Travel Time Unit Cost	$ 19.01	$ 21.55	$ 18.75	/hr
Travel Time Delay Cost	$ 9.17	$ 14.96	$ 8.77	
Period factor	1.21	6.23	1.97	
Travel Time Delay total period	$ 11.10	$ 93.21	$ 17.28	
Total Travel Time Delay per day	$ 121.58			
Total Travel Time Delay per year	$ 40,122.64			

Assumptions:
Traffic Flows from 2011, 2021 and 2031 Tracks Model
The signals will be triggered by pedestrians every 5mins on average
A crossing time of 20sec has been assumed
The time cost is from the PEM Table A4.3 incl congestion cost
330 days used when converting from day to year due to public holidays / weekends

2021

	AM (1hr flows)	IP (2hr flows)	PM (1hr flows)	
Traffic Flow				
Nbnd + Sbnd combined	2651	3965	2612	veh/hr
Stop Time	240	240	240	sec / hr
Traffic Arriving During Stop Time	177	264	174	veh
Cross time	20	20	20	sec
Average length of time traffic stopped	10	10	10	sec
Vehicle hours of delay	0.49	0.73	0.48	hours
Travel Time Unit Cost	$ 19.01	$ 21.55	$ 18.75	/hr
Travel Time Delay Cost	$ 9.33	$ 15.82	$ 9.07	
Period factor	1.21	6.23	1.97	
Travel Time Delay total period	$ 11.29	$ 98.58	$ 17.87	
Total Travel Time Delay per day	$ 127.74			
Total Travel Time Delay per year	$ 42,153.61			

2031

	AM (1hr flows)	IP (2hr flows)	PM (1hr flows)	
Traffic Flow				
Nbnd + Sbnd combined	2955	4441	2809	veh/hr
Stop Time	240	240	240	sec / hr
Traffic Arriving During Stop Time	197	296	187	veh
Cross time	20	20	20	sec
Average length of time traffic stopped	10	10	10	sec
Vehicle hours of delay	0.55	0.82	0.52	hours
Travel Time Unit Cost	$ 19.01	$ 21.55	$ 18.75	/hr
Travel Time Delay Cost	$ 10.40	$ 17.72	$ 9.75	
Period factor	1.21	6.23	1.97	
Travel Time Delay total period	$ 12.59	$ 110.41	$ 19.21	
Total Travel Time Delay per day	$ 142.22			
Total Travel Time Delay per year	$ 46,931.00			

Maintenance cost of - Section of SH 88 realignment
- Existing Thomas Burns / Frigatt St intersection

VOC / TTC / ACC at the Thomas Burns / Frigatt Intersection

SH88 Realignment Section

DISCOUNTING

WORKSHEET A1.2

PROJECT NAME: Rattray Street Crossing PFR - Relocation of Shunting Yards
1. Option: DO MINIMUM
2.Base Date(Yr 2006
3.Time Zero(Yr 2007

																2.0%	
4	TYPE OF COST OR BENEFIT	Road Reseal - SH 88	Road Reseal - SH 88	Road Reseal - SH 88	Road Reseal - SH 88	Road Reseal - Thomas Burns Intersection	Road Reseal - Thomas Burns Intersection	Road Reseal - Thomas Burns Intersection	Road Reseal - Thomas Burns Intersection		VOC - Thomas Burns Intersection	TIME - Thomas Burns Intersection	ACC - Thomas Burns Intersection	VOC - SH 88	TIME - SH 88	2-Dec-06 ACC - SH 88
5	YEAR OF ESTIMATE	2006	2006	2006	2006	2006	2006	2006	2006		2006	2006	2006	2006	2006	2006
6	SINGLE PAYMENT:	Road Reseal	Road Reseal	Road Reseal	Road Reseal	Road Reseal	Road Reseal	Road Reseal	Road Reseal							
(a)	Amount	80.000	80.000	80.000	80.000	30.000	30.000	30.000	30.000							
(b)	Time, n	4	12	20	28	4	12	20	28							
(c)	SPPWF for Time n	0.6830	0.3186	0.1486	0.0693	0.6830	0.3186	0.1486	0.0693							
(d)	PV Time Zero (a) x (c)	54.641	25.490	11.891	5.547	20.490	9.559	4.459	2.080							
7	UNIFORM SERIES															
(a)	Annual Amount															
(b)	Start Time, s															
(c)	End Time, e															
(d)	USPWF for s years															
(e)	USPWF for e years															
(f)	PV Time Zero															
8	ARITHMETIC GROWTH															
(a)	Initial Amount (Time Zero)															
(b)	Arithmetic Growth Rate										VOC	TIME	ACC - Thomas Burns Intersection	VOC	TIME	ACC - SH 88
(c)	Start Time, s												138.600	280.536	393.868	60.418
(d)	End Time, e												0.010	0.020	0.020	0.010
(e)	USPWF for s years										Discounted in sheet 'Rattray St Delay - Do Min'	Discounted in sheet 'Rattray St Delay - Do Min'	0	0	0	0
(f)	USPWF for e years												29	29	29	29
(g)	AGPWF for s years												0.000	0.000	0.000	0.000
(h)	AGPWF for e years												9.831	9.831	9.831	9.831
(i)	PV Time Zero (a) x [(f) - (e) x (b) x ((h)-(g))]												0.000	0.000	0.000	0.000
	TYPE OF COST OR BENEFIT												83.963	83.963	83.963	83.963
9	TOTAL PV TIME ZERO	54.641	25.490	11.891	5.547	20.490	9.559	4.459	2.080				1.478.900	3.228.938	4.533.382	644.677
10	UPDATE FACTOR for Year of Estimate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.711.437.049	3.203.989.423	1.678.900	3.228.938	4.533.382	644.677
11	TOTAL PV TIME ZERO Adjusted to Base Date (9) x (10)	54.641	25.490	11.891	5.547	20.490	9.559	4.459	2.080		1.30	1.11	1.12	1.30	1.11	1.12
											2.224.868.163	3.556.428.260	1.656.368	4.197.619	5.032.054	722.038

Ob Minimum Costs

DISCOUNTING VOC & TTC Rattray St / Thomas Burns St Link-Intersection — For entire Dunedin Road Network - from Dunedin Transportation Model

VOC																												
Year	2005 0	2006 0	2007 1	2008 2	2009 3	2010 4	2011 5	2012 6	2013 7	2014 8	2015 9	2016 10	2017 11	2018 12	2019 13	2020 14	2021 15	2022 16	2023 17	2024 18	2025 19	2026 20	2027 21	2028 22	2029 23	2030 24	2031 25
Cost ($/day)	$ 441,000.00	$442,333	$443,667	$445,000	$446,333	$447,667	$433,000	$435,900	$438,800	$441,700	$444,600	$447,500	$450,400	$453,300	$456,200	$459,100	$462,000	$466,700	$471,400	$476,100	$480,800	$485,500	$490,200	$494,900	$499,600	$504,300	$509,000
Cost ($/yr)	$ 160,965,000.00	$161,451,667	$161,938,333	$162,425,000	$162,911,667	$163,398,333	$158,045,000	$159,103,500	$160,162,000	$161,220,500	$162,279,000	$163,337,500	$164,396,000	$165,454,500	$166,513,000	$167,571,500	$168,630,000	$170,345,500	$172,061,000	$173,776,500	$175,492,000	$177,207,500	$178,923,000	$180,638,500	$182,354,000	$184,069,500	$185,785,000
Discount Factor	1.000	1.000	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.350	0.319	0.290	0.263	0.239	0.218	0.198	0.180	0.164	0.149	0.135	0.123	0.112	0.102	0.092
Present Worth ($)		$161,451,667	$147,216,667	$134,235,537	$122,397,946	$111,603,260	$98,133,511	$89,809,776	$82,188,431	$75,210,553	$68,822,137	$62,973,677	$57,619,795	$52,718,903	$48,232,685	$44,126,813	$40,368,681	$37,072,144	$34,041,352	$31,255,231	$28,694,344	$26,340,766	$24,177,967	$22,190,712	$20,364,959	$18,687,766	$17,147,212
SUM (yr 0-29)		$1,711,437,019																									
SUM (yr 0-7)		$947,036,796																									

TTC																											
Year	2005 0	2006 0	2007 1	2008 2	2009 3	2010 4	2011 5	2012 6	2013 7	2014 8	2015 9	2016 10	2017 11	2018 12	2019 13	2020 14	2021 15	2022 16	2023 17	2024 18	2025 19	2026 20	2027 21	2028 22	2029 23	2030 24	2031 25
Cost ($/day)	$ 697,000.00	$722,667	$748,333	$774,000	$799,667	$825,333	$851,000	$856,500	$862,000	$867,500	$873,000	$878,500	$884,000	$889,500	$895,000	$900,500	$906,000	$916,000	$926,000	$936,000	$946,000	$956,000	$966,000	$976,000	$986,000	$996,000	$1,006,000
Cost ($/yr)	$ 254,405,000.00	$263,773,333	$273,141,667	$282,510,000	$291,878,333	$301,246,667	$310,615,000	$312,622,500	$314,630,000	$316,637,500	$318,645,000	$320,652,500	$322,660,000	$324,667,500	$326,675,000	$328,682,500	$330,690,000	$334,340,000	$337,990,000	$341,640,000	$345,290,000	$348,940,000	$352,590,000	$356,240,000	$359,890,000	$363,540,000	$367,190,000
Discount Factor	1.000	1.000	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.350	0.319	0.290	0.263	0.239	0.218	0.198	0.180	0.164	0.149	0.135	0.123	0.112	0.102	0.092
Present Worth ($)		$263,773,333	$248,310,606	$233,479,339	$219,292,512	$205,755,527	$192,867,477	$176,467,251	$161,454,939	$147,713,731	$135,136,586	$123,625,420	$113,090,362	$103,449,071	$94,625,111	$86,552,375	$79,164,557	$72,762,125	$66,869,520	$61,446,957	$56,457,674	$51,867,708	$47,645,688	$43,762,650	$40,191,852	$36,908,616	$33,890,168
SUM (yr 0-29)		$4,209,988,428																									
SUM (yr 0-7)		$1,701,400,984																									

Modelled years are in bold. VOC and TTC come from Tracks model

Option Costs.

For entire Dunedin Road Network - From Dunedin Transportation model

DISCOUNTING VOC & TTC Rattray St / Thomas Burns St Link-Intersection

Option 1

VOC																										
Year	2005 0	2006 0	2007 1	2008 2	2009 3	2010 4	**2011** 5	2012 6	2013 7	2014 8	2015 9	2016 10	2017 11	2018 12	2019 13	2020 14	**2021** 15	2022 16	2023 17	2024 18	2025 19	2026 20	2027 21	2028 22	2029 23	2030 24
Cost ($/day)	$ 441,000.00	$442,333	$443,667	$445,000	$446,333	$447,667	**$433,000**	$435,900	$438,800	$441,700	$444,600	$447,500	$450,400	$453,300	$456,200	$459,100	**$462,000**	$466,700	$471,400	$476,100	$480,800	$485,500	$490,200	$494,900	$499,600	$504,300
Cost ($/yr)	$ 160,965,000.00	$161,451,667	$161,938,333	$162,425,000	$162,911,667	$163,398,333	**$158,045,000**	$159,103,500	$160,162,000	$161,220,500	$162,279,000	$163,337,500	$164,396,000	$165,454,500	$166,513,000	$167,571,500	**$168,630,000**	$170,345,500	$172,061,000	$173,776,500	$175,492,000	$177,207,500	$178,923,000	$180,638,500	$182,354,000	$184,069,500
Discount Factor	1.000	1.000	0.909	0.826	0.751	0.683	**0.621**	0.564	0.513	0.467	0.424	0.386	0.350	0.319	0.290	0.263	**0.239**	0.218	0.198	0.180	0.164	0.149	0.135	0.123	0.112	0.102
Present Worth ($)		$161,451,667	$147,216,667	$134,235,537	$122,397,946	$111,603,260	**$98,133,511**	$89,809,778	$82,188,431	$75,210,553	$68,822,137	$62,973,677	$57,619,795	$52,718,903	$48,232,885	$44,126,813	**$40,368,681**	$37,072,144	$34,041,352	$31,255,231	$28,694,344	$26,340,766	$24,177,967	$22,190,712	$20,364,959	$18,687,766
SUM (yr 8-29)		$764,400,253																								
SUM (yr 0-7)		$947,036,796																								
SUM (yr 0 - 29)		$1,711,437,049																								

TTC																										
Year	2005 0	2006 0	2007 1	2008 2	2009 3	2010 4	**2011** 5	2012 6	2013 7	2014 8	2015 9	2016 10	2017 11	2018 12	2019 13	2020 14	**2021** 15	2022 16	2023 17	2024 18	2025 19	2026 20	2027 21	2028 22	2029 23	2030 24
Cost ($/day)	$ 697,000.00	$722,833	$748,667	$774,500	$800,333	$826,167	**$852,000**	$857,500	$863,000	$868,500	$874,000	$879,500	$885,000	$890,500	$896,000	$901,500	**$907,000**	$917,100	$927,200	$937,300	$947,400	$957,500	$967,600	$977,700	$987,800	$997,900
Cost ($/yr)	$ 254,405,000.00	$263,834,167	$273,263,333	$282,692,500	$292,121,667	$301,550,833	**$310,980,000**	$312,987,500	$314,995,000	$317,002,500	$319,010,000	$321,017,500	$323,025,000	$325,032,500	$327,040,000	$329,047,500	**$331,055,000**	$334,741,500	$338,428,000	$342,114,500	$345,801,000	$349,487,500	$353,174,000	$356,860,500	$360,547,000	$364,233,500
Discount Factor	1.000	1.000	0.909	0.826	0.751	0.683	**0.621**	0.564	0.513	0.467	0.424	0.386	0.350	0.319	0.290	0.263	**0.239**	0.218	0.198	0.180	0.164	0.149	0.135	0.123	0.112	0.102
Present Worth ($)		$263,834,167	$248,421,212	$233,630,165	$219,475,332	$205,963,277	**$193,094,113**	$176,673,284	$161,642,241	$147,884,006	$135,291,381	$123,766,143	$113,218,292	$103,565,371	$94,731,839	$86,648,491	**$79,251,935**	$72,849,503	$66,956,176	$61,532,300	$56,541,227	$51,949,090	$47,724,604	$43,838,878	$40,265,225	$36,979,024
SUM (yr 8-29)		$1,504,591,870																								
SUM (yr 0-7)		$1,702,733,791																								
SUM (yr 0 - 29)		$3,207,325,661																								

Modelled years are in bold. VOC and TTC come from Tracks model