Fiordland Link Experience

Business Plan Review

Report prepared for:

Department of Conservation

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Contents

Status

Table of tables

Table of figures

Summary

Introduction	The Reviewer was engaged by the Department of Conservation ("DoC" and "the Department") in December 2013 to review the October 2013 Business Plan for Fiordland Link Experience ("FLE" and the "Project"). The purpose of the review is to give an opinion on the overall soundness of the business plan and the financial viability of the Project. TRC Tourism assisted us with information on visitors to Milford, and an assessment of the tourism aspects of the Project. DoC sought our opinion and comment on the matters discussed in turn below.
Business Plan soundness	The October 2013 Business Plan is a very high-level sketch. It largely circumvents key business issues normally covered in a good practice business plan. Instead it markets a solution to the reader based on regional and industry economic benefits of a new attraction in Queenstown. The Reviewer's rating assessment is between 'poor' and 'not adequate'. In the Reviewer's opinion, the Business Plan: • Overly relies on assumptions about the potential market for the proposed service that are: – Unsupported by market research. – Based on old tourism data. – Optimistic about the appeal of the proposed service. • Relies on an engineering assessment that is: – At a preliminary planning stage and therefore subject to cost increases relating to advancing to an engineering design level. – Five years old and therefore prone to material cost escalation. – Does not assess significant potential costs (e.g., reinstatement, dedicated electric power supply assets and monorail vehicle specification). • Demonstrates little evidence of thorough planning of the 'journey' from a business idea to the successful establishment of a profitable business. For these reasons, the Business Plan cannot be relied upon. The most pressing need to improve the Business Plan concerns the following: • Market research on the size and customers' willingness to pay for the proposed service's attributes. • A more advanced engineering assessment for the monorail track (construction and deconstruction), related and supporting infrastructure, and specification for procurement of the monorail vehicle. • Evidence for market appetite for underwriting of the reinstatement bond requirements, and associated terms and conditions.

Business viability, achievability & risk

The financial modelling that accompanied the Business Plan provides a starting point for a financial model to represent the business over a complete investment cycle.

We have constructed a Discounted Cash Flow ("DCF") model of the business over a 25 year horizon for the purpose of testing the viability of the business and its sensitivity to risk.

A standalone business is said to be viable when it occupies a place in the market that enables it over the long term to meet its obligations as they fall due, maintain, refurbish or replace its operating assets, and pay its capital providers a return on investment that meets their expectations. In a DCF analysis framework a business is viable when the business generates sufficient free cash flow to meet all future operating and capital expenses, and pay investors a return just equal to their weighted average required return on capital provided. This corresponds to a non-negative net present value ("NPV") of expected future cash flows discounted at the weighted average cost of capital ("WACC"[1]).

When the model's parameters are set to those presented in the Business Plan, the NPV of free cash flows in constant 2014$ terms is $118 million. This is the Enterprise Value ("EV"). Thus, *prima facie* the proposed business appears viable. However, there are material differences between the Business Plan assumptions for the key parameters and realistic values. There are three categories of variation:

- Variation in the cost of supplying the service[2].

  Adding likely cost overruns, an allowance for working capital, fewer operating days, and dedicated power supply assets, means that the EV of the project lies in a range between negative $41 million to $118 million in 2014$. The lower end of the range provides a realistic EV estimate.

- Variation in the estimated patronage demand[2].

  Adopting the TRC Tourism's recommended scenario gives an range for the EV of negative $336 million to negative $441 million on 2014$[3].

  The EV estimate remains large and negative even if $159 million in 2014$ is added back to represent the variation in the cost of supplying the service.

- Variation from the cost of meeting contractual obligations.

  The cost of providing assurance to the affected landowners depends critically on the availability of sureties willing to take on the reinstatement risk. Not being able to obtain an underwriter for the reinstatement bond means the Project will need to find $275 million extra capital, reducing EV accordingly. If the Project is able to find a surety then the likely cost, based on current market rates, would be $45 million in 2014$.

The conclusion of this financial analysis is that the Project faces major challenges to becoming a viable business. Moreover the risks to the business are largely outside the Applicant's ability to control, and hence are of major consequence:

- The biggest challenge is the sensitivity to the size of the potential market for the service.

[1] See Appendix A.

[2] Note, this EV estimate does not include any requirement for reinstatement bond to be lodges.

[3] Note such large negative EV estimates really have little meaning in practise because no rational investor would commit capital to an undertaking in the expectation of destroying large amounts of shareholder value.

- The next biggest challenge is potential capital cost overruns.
- Finally, it is our opinion that the Applicant will not find an underwriter for the cost of restoring the natural environment and will need to capitalise reinstatement bonds that are likely to be required by all the affected landowners.

We have considered whether a 'second mouse' might be able to operate the business after purchasing all the operating assets and consents for nil consideration. The answer depends on whether there is market appetite for a surety to underwrite the reinstatement bond requirements. If a surety could be found then then there is a possibility that a second mouse could make the business viable after purchasing the business, assets and concessions for nil consideration.

Concession fee

The Applicant proposes a fee arrangement calculated on 26.9 percent of the Applicant's revenue, net of commissions paid to wholesalers.

The concession payment is calculated by multiplying the concession base by the applicable concession rate.

The concession rate is a tapering scale of partial rates, as shown below:

Concession base	Rate
$m	%
Up to $5	7
Exceeds $5 but does not exceed $10	5
Exceeds $10	1

This proposed fee arrangement is unusual in the respect that it declines as the business revenue grows: most similar commercial arrangements are either proportionate to revenue or increase as revenue and/or profitability grows.

Based on the Applicant's patronage assumption, the present discounted value of the concession fee to DoC would be $2.6 million in 2014$.

A more usual, principles-based approach is to base the concession fee on the value of the property rights transferred under the concession arrangement. Our Alternate concession fee proposal, based on such principles, is a two-part charge, as follows:

- An occupation charge calculated at 6.75 percent of value of land under the easements and leases sought, reviewable five-yearly, payable monthly in advance. The estimate value of ground rent payable per annum in the period before the first review is $25,780.
- A business use charge of $2 per passenger payable monthly in arrears.

The alternate fee proposal delivers revenue to DoC with a present value of $4 million in 2014$.

Restitution bond & sureties

There are strong public policy grounds for requiring the Applicant to capitalise the risk that it may not be able to perform its obligations under the concession contract to reinstate the natural environment if the venture is unviable.

In the absence of a specific engineering assessment of decommissioning, deconstruction, removal and environmental restoration, we suggest using the estimated construction cost reduced by 15 percent for the scrap value of recycled material as a working estimate of such costs.

On this basis, the requirement for sureties from the Applicant in favour of all the landowners is between $180 million and $275 million.

DoC should seek a bond for a proportionate share this amount, and adjust it annually in line with changes in the relevant PPI series. Every 10 years the surety requirement should be reviewed to ensure it covers an assessed cost of deconstruction, removal and restoration. If the proportionate share is based on track length within the conservation estate then DoC should require 67 percent or $120 million to $180 million to be provided as surety.

As the Business Plan currently stands, we think the Applicant will find it difficult to give an underwriter enough confidence to take on the risk of a call on the bond.

Construction costs

The Business Plan presents an estimate of $210 million (in 2009$) based on an engineering assessment undertaken in 2009 by Opus[4]. The draft Construction Management Plan (3 November 2011) also refers.

Civil works associated with the monorail track is the major component of the total estimated initial capital expenditure on the Project of $243 million (2009$).

Of secondary consideration is the procurement of a single articulated 160-seat straddle monorail vehicle with an estimate cost of $13 million (2009$). The Business Plan also isolates $8.7 million for the construction of four terminals Queenstown, Mt Nicholas Wharf, Kiwi Burn and at Te Anau Downs.

Capital cost overruns and delays associated with transport infrastructure projects are commonplace, and large, which implies a significant element of inherent commercial risk for a business undertaking such a project.

The construction cost estimate presented in the Business Plan is five years old, and based on a preliminary planning assessment of the engineering requirements. Based on experience with rail infrastructure projects, cost overruns can be expected in the range of 34 percent and 45 percent. In our assessment we have used the higher figures, which are still low by comparison with per-kilometre construction costs for straddle monorail systems installed overseas.

From the preliminary planning assessment undertaken by Opus we have made estimates of the as-built construction costs, as follows:

- An allowance of $15 to $20 million for dedicated power infrastructure assets.
- Using the methodology set out in *Flyvbjerg et al*[5] we have estimated the likely cost overruns of the train-related civil works to be in the range of 34 percent to 45 percent.
- For other capital costs we have indexed the figures in 2009$ to 2015/16$ using actual construction cost changes estimated by the Department of Statistics and forecasts published by the New Zealand Institute of Economic Research.

Even the resulting escalated capital cost estimate looks low on a per kilometre basis when compared to recent straddle monorail installations overseas. Our top end estimate at US$4.6 per km compares with an average of recent installations at US$19 million per km. There are reasons why the proposed track could have a lower per km

[4] Opus International Consultants Limited – Preliminary Engineering Assessment of Monorail Proposal, September 2009. See Appendix E of the Concession Application.

[5] See Section 6.

cost than one built in a dense urban environment, but the large variance causes us to question the completeness of the proposed works scope.

The Business Plan does not address the cost of decommissioning, deconstruction and removal of the monorail track, service road and consequential environmental restoration. Thus, the deconstruction, removal and restoration costs are likely to be between $180 million and $275 million for the entire monorail track ($3.7 million to $5.7 million per km).

What we recommend

Ordinarily we would recommend that the Applicant be invited to review its work and resubmit a new business plan. However, there seems little prospect that the business idea could translate into a viable business.

Therefore, we recommend that the Department invite the Applicant to withdraw on the reasonable grounds that there is too remote a possibility of establishing a viable business for it to consider granting a concession.

1. Introduction

Introduction

In December 2013, the Department of Conservation engaged Ian Dickson & Associates to undertake a review of the business plan for Fiordland Link Experience dated October 2013 and to give an opinion on the financial viability of the venture and the overall soundness of the business plan.

Specifically we were asked to consider the following:

1. The viability of the business by assessing the projections for size of market, number of passengers, revenue, operating costs, profitability and ability to service debt.
2. The achievability and risks in achieving the plan.
3. Acceptability of the proposed concession activity fee (including calculations, rates and any other associated concerns that impact on the rate paid).
4. The mechanism to protect public interest and ensure that the affected areas are returned to their natural state should the venture prove unsuccessful. In particular to consider how that might be calculated over both the construction period and the life of the asset.
5. Assessment of whether construction costs proffered by the applicant are likely to be realistic given the scale, type and location of the construction works (including all rolling stock etc. to establish an operational business) and what a realistic value for this would be.

The review is to include sensitivity analysis, including changes in revenue assumptions and construction costs.

Fiordland Link Experience Overview

The Applicant has applied for the easements, leases and concessions to permit construction, operation, and maintenance of a 29.5 km straddle monorail track. The proposed track would run along the Mararoa River through the Snowdon Forest Stewardship Area coming out at Te Anau Downs in Fiordland National Park and join State Highway 94 (to Milford Sound) in the Te Wāhipounamu World Heritage Area.

The proposed 160-seat multi-car straddle monorail is one part of a multi-modal journey between Queenstown and Te Anau that would include a 20 km journey by 200-seat catamaran across Lake Wakatipu to Mt Nicholas Station and a 45 km terrain-suitable vehicle trip linking to the monorail. Together, the three elements comprise the Project. The Project, once commissioned will:

- Reduce travel times between Queenstown and Te Anau, although having regarded to the necessity to change transport modes three times during the journey, the materiality of the time saving is conjectural.
- Reduce traffic on SH6 and SH 94.
- Offer a new tourism experience to complement the existing offerings in Queenstown and its environs. The Project is presented as a visitor attraction in its own right employing multi-modal travel through unique natural landscapes.
- Operate around six trips daily passenger capacity of:
  - Catamaran 1,200 passengers daily.
  - Terrain suitable vehicle and monorail, 960 passengers daily.

  - On the basis of 360-day annual operations this gives an annual capacity for day light return trips to Queenstown of 345,600.
- Employ 95 staff.

Commissioning the project entails:

- Obtaining the necessary consents, easements, leases and concessions.
- Constructing the following facilities:
  - Passenger terminals.
  - Workshops and equipment servicing facilities.
  - Civil engineering works, particularly construction of the straddle monorail track and service road (with a future dual use as a cycleway) within the 200 metre-wide easements sought. Works include up to three passing bays to allow simultaneous operation of up to four vehicles.
- Procurement of necessary plant and equipment:
  - Catamarans.
  - Terrain-suitable vehicles.
  - Monorail vehicle(s) and supporting plant, equipment and spare parts.
  - Sundry plant and equipment, vehicles etc.
- Arranging electricity supply.
- Staff recruitment and training.
- Obtaining the necessary licence approvals to operate a railway (under the Railways Act 2005).
- Initial capital expenditure budgeted at $243 million as follows:
  - Catamarans (2), $7 million.
  - Terrain-suitable vehicles (4), $2 million.
  - Passenger terminal facilities (4), $9.5 million.
  - Monorail track, $210 million.
  - Monorail vehicle, $13 million.
  - Consultants and legal $1.5 million.
- Financing the capital and working capital requirements. A financing plan is not contained within the Business Plan although reference is made to discussions with GE Capital and unidentified investors.
- Business integration and inception.

DoC's role

DoC is the Government agency charged with promoting conservation of the natural and historic heritage of New Zealand on behalf of, and for the benefit of, present and future New Zealanders. This means DoC has responsibilities for:

- Maintaining as much as possible the integrity of NZ's indigenous ecosystems.
- Acting as guardian to some of New Zealand's cultural and historic heritage.
- Contributing to the recreation opportunities of all New Zealanders.
- Supporting in-bound and domestic tourism.
- Giving effect to the principles of the Treaty of Waitangi in accordance with Section 4 of the Conservation Act.

DoC's role is to advise the Minister of Conservation on the concessions sought by the Applicant.

Sources employed	The following sources were employed in this review: • 'Business Plan for Fiordland Link Experience' by RHL, dated October 2013 comprising 18 pages (the "Business Plan"). • A supplementary document entitled 'FIORDLANDLINK EXPERIENCE – Riverstone Holdings Limited' containing financial projections for the years ending 31 December 2012 to 2022 (four pages). The numbers presented in this document align with the summaries in the Business Plan. • 'The FiordlandLink Experience: A Tourism Assessment' by Dr J P Moriarty commissioned by RHL. • 'Review of the Tourism Aspects of the Fiordland Link Project Application' by TRC Tourism, January 2014. • Fiordland Link Experience: preliminary Engineering Assessment of Monorail proposal' by Opus International Consultants Ltd ("Opus), commissioned by RHL. • "Fiordland Link Experience: Department of Conservation Concession Application by RHL dated 4 November 2009. • Doc Officer's Report to Decision Maker on RHL's Concession Application (PERMISSION RECORD NUMBER: SO-26649-OTH FILE: PAC-14-18-34) dated 1 December 2011. • 'Fiordland Link Experience Construction Management Plan' and 'Fiordland Link Experience Operational Management Plan' both by RHL and dated 3 November 2011. • 'Appreciating Value, Edition No. 4, September 2013' published by PricewaterhouseCoopers New Zealand ("PwC").
Monetary amounts	References to monetary amounts are expressed in New Zealand dollars (NZ$) and exclusive of Goods and Services Tax (GST) unless indicated otherwise. Monetary amounts that have been adjusted for inflation, or are expressed as a present discounted value of a future dollar amount, are denoted with the words 'in 20xx$" terms, where 20xx is the base year. For the most part the two reference dates used are 2009$ (the base year for estimates presented in the Business Plan), and 2014 as the base year for discounted future amounts presented in this report.
Reviewer's credentials	The Reviewer was Ian Dickson. No person other than the Reviewer prepared the analyses, conclusions and opinions regarding the Business Plan that are set forth in this report. Ray Salter of TRC Tourism was engaged separately by the Department to provide specialist tourism-related advice on the Business Plan. TRC Tourism's analysis and recommendations have been adopted in this review. The Reviewer holds an honours degree in economics from Canterbury University. He has attended courses at the IMF Institute in Washington DC and the International Center for Money and Banking (ICBM) in Geneva. He has also completed financial modelling training (Fundamentals of Financial Modelling and Fundamentals of Valuation Analysis) by the investment banking training firm Wall StreetPrep.

The Reviewer's career includes nine years in the NZ Government Treasury, thirteen years in the capital markets and fifteen years as a financial and economic consultant. He has significant experience of advising and acting in mergers, acquisitions and divestments. This experience includes preparing and reviewing the economic analyses and valuations that support the underpinning business cases and plans. He has performed such analyses in industries including agribusiness, aviation, extractive industries, marine transport, rail transport (metro and freight), banking and finance, construction, electricity generation and distribution, engineering services, forestry, geothermal, ICT, manufacturing, rural services, tertiary education and resort tourism.

Limitations & disclaimer

The statements and opinions expressed in this report are based on information available as at the date of the report.

The Reviewer's opinion has been arrived at based on economic, market and other conditions prevailing at that date. Such conditions may change significantly over relatively short periods. We reserve the right, but will be under no obligation, to review or amend our report, if any additional relevant information, which was in existence on the date of this report and was not brought to our attention, subsequently comes to light.

In preparing this report, we have not independently verified the accuracy of information provided to us, and have not conducted any form of audit in respect of RHL or Fiordland Link Experience.

Advance draft

An advance draft of this report was provided to DoC, solely for the purpose of verifying factual matters.

Minor changes were made to the drafting of the report as a result of the circulation of the draft report. There was no alteration to any part of the substance of this report, including the methodology, valuations or conclusions as a result of issuing the draft.

Report structure

The rest of this report document is structured in sections as follows:

- In the next section entitled Business Plan we present an opinion on the overall soundness of the Business Plan.
- Section 3 is where we address questions of business viability, achievability and sensitivity to risk affecting the key value drivers of the business.
- Section 4 comments on the proposed concession fee and the principle underpinning and Alternate proposal.
- In Section 5 we discuss the requirement for sureties to protect the public interest against the risk of abandonment of the Project.
- Construction costs are the subject of Section 6.
- There are two appendixes:
  - Appendix A presents an estimate of the cost of capital employed in the proposed business
  - Appendix B contains an acquittal of the Reviewer's Terms of Reference.

In the next section, we examine the soundness of the Business Plan.

2. Business Plan

Introduction

In this section, we give an opinion on the overall soundness of the Business Plan.

The Business Plan presented for our review is in two documents:

- 'Business Plan for Fiordland Link Experience' by RHL, dated October 2013 comprising 18 pages (the "Business Plan").
- A supplementary document entitled 'FIORDLANDLINK EXPERIENCE – Riverstone Holdings Limited' containing financial projections for the years ending 31 December 2012 to 2022 (four pages).

There are many approaches to constructing and presenting a business plan for a start-up venture. Any business plan is a 'map' of a proposed 'journey' from a business idea to the establishment of a successful profitable business. The business plan encompasses the intended means and methods of supplying the proposed product or service, the planned supporting organisational and financial arrangements (including requirements for and sources of capital), and the management planning to make it happen.

Business plans are commonplace documents. They are used extensively as a means of communication inside firms and between firms and their suppliers, customers and financial backers. Good business plans that are convincing follow a standard approach.

Elements of a good business plan

The elements of a convincing business plan that are generally accepted as the minimum necessary contents are the following:

- The **business idea**. This comprises the promoter's assessment of:
  - How the intended product or service delivers benefits by meeting genuine customer needs[6].
  - The potential market size and competitive characteristics[7].
  - How the product or service is differentiated from its competitors.
  - The revenue mechanism (prices and costs).
- The **management team**. Investors usually look for combinations of 'hard' factors (such as previous experience working together, recent relevant experience, mix of skills) and 'soft' factors such as personal commitments, social skills,

[6] Choice Modelling based on Choice Experiments is the technique used in nearly every case where a hard estimate of current and future customer preferences for a product or service attributes and willingness to pay need to be established Choice modelling forces respondents to consider trade-offs between product attributes (e.g., positive attributes such as reduced travel time and scenic attractions versus negative attributes such as modal changes and reduced travel flexibility). Importantly, choice modelling enables implicit prices to be estimated for product attributes. It can be used to estimate the level of customer demand for alternative attribute combinations.

[7] Product forecasting is used to predict how a new product will perform in the marketplace. The forecasting model takes into account such things as product awareness, distribution, price, fulfilling unmet needs and competition from substitutes. The two main approaches to new product modelling are the Bass Diffusion Model and the Fourt-Woodlock Model. Fourt-Woodlock models adoption by households in a geographic area so is less relevant than the Bass model. The Bass model estimates the probability of adoption at point in time based on estimates of the rate at which adoption is changing with respect to time, the total number of consumers who will eventually adopt (saturation level), and coefficients for innovation and imitation.

temperament, resilience and perseverance. The intention of the founders and proposed ownership structures and incentives are also relevant.

- **Marketing**. This section must be able to convince the reader that a market can be created for the business idea that can be served profitably. The marketing section is about deliberate (tactical) choices to target profitable market segments and erect barriers to competitors.
- **Business system** and **organisational arrangements**:
  - The business system describes the activities that need to be performed to produce a product or service and deliver it to customers at the desired level of quality and cost. One of the key questions relating to the business system is the boundaries of the firm: what activities the firm should perform internally and what tasks it should outsource to others ("make" or "buy").
  - In addition to the business system, the business plan needs to address the proposed organisational arrangements. This comprises 'hard' factors such as organisation charts, role descriptions and operating locations, as well as 'soft factors' such as values and culture.
- **Realisation**. How the business plan will be turned into reality. Typically, this is presented with a GANTT chart that highlights milestones and important interdependencies.
- **Risks**. Every business involves risk. Risks arise within the organisation itself and risks can arise in its external operating environment. Risk is never stationary and must be continually reassessed. A business plan will normally identify and quantify risks in relation to their potential to throw off attainment of the business goals. The risk assessment will also outline intended management countermeasures proposed. This identifies how much risk is controllable and how much is outside the control of the management and must be endured.
- **Financing**. The questions addressed in the financing section of a business plan are normally the following:
  - What is a realistic estimate of the amount of capital required and when?
  - How much working capital is required at any point in time to meet current liabilities as they fall due (solvency)?
  - How, from where, and in what form (e.g., debt or equity) the funds will be obtained?

  The answers to these questions are normally supplemented with the following:
  - *Pro forma* financial statements comprising, at a minimum, statements of financial position, financial performance and source and application of funds.
  - Description of the core business scenario identifying key financial ratios, the break-even point for cash flow and profitability, the value of the investment and projected return on investment.

In addition to being a document that provides an analysis of firm goals and objectives, a business plan is meant to attract stakeholders. Many start-up firms seek seed investment capital. Banks and investors use the business plan to help them determine whether the firm has significant potential and if the balance of risk and return is acceptable.

Example of business plan requirements used as a preliminary screen by a venture capital firm that specialised in providing seed capital to start-up ventures.

These ten questions only scratch the surface of what investors need to feel comfortable with before they make an investment decision. However, if you can offer good answers to these ten, you're almost guaranteed to be invited for further discussions

In deciding whether or not they want to discuss investing in a new venture, investors in start-up ventures generally want answers to the following questions:

1. What is the problem? Basically, if there is not a big problem in the market - a major unfilled need - then there is no point in trying to sell a solution. So explain how people or firms are experiencing a significant level of pain because existing solutions are deficient.

2. What is your solution, and what makes it special? This one is obvious. Tell them what you do, and how your customers will benefit relative to existing solutions.

3. How big or severe is the problem? An attractive problem, from the investor's point of view, is a big problem.

4. How will you make money? This may be obvious for some firms, but not so obvious for many others. Software, for example, can be sold on a per-user or per-site basis, with or without recurring licensing fees, with or without recurring maintenance fees, with or without installation or customisation, and so forth - or you could give away the razor and make your money on blades.

5. Who will buy it, and how will you sell it to them? That is, how do you segment your potential customers, and what is your plan to efficiently make them aware of your product and decide to give you their money in exchange for it?

6. Why are you the best team to do this? You may have a great solution to a big problem, but you will not get an investor if your team does not have the skills and experience that demonstrates your ability to implement your vision.

7. What are the alternative solutions, and what makes yours the best? No matter what you may think, you do have competitors. What makes your solution objectively better than the alternative solutions?

8. What have you done, and what will you do? Ideas are dime-a-dozen. Implementation is what really counts. You need to show that you have the ability to make the right things happen. A good prior track record and aggressive future milestones (along with a realistic plan for making it happen) shows that you mean business.

9. What are the economics? Investors want a means of measuring your progress, often in the form of metrics that can be measured. Many of these metrics are economic - revenue per headcount, expense per headcount, marginal gross margins, revenue per customer, cumulative units to break-even, and so forth.

10. How much do you need, and what will you do with my money? Investors want to know if you have a realistic understanding of the costs involved in starting and growing your business.

We now examine how well the Business Plan addresses the generally accepted criteria for a convincing business plan. We have assessed the completeness of the Business Plan using the checklist provided in “The New Venture Adventure” by Looser and Schlapfer

1. What exactly is innovative about the business idea?	
How unique is the business idea?	Conjectural, having regard to the positive ‘experience’ features but negative inconvenience of mode changes, and restricted flexibility for visitors whose end destination is not Queenstown. Monorails as visitor attractions elsewhere have not maintained their appeal to visitors.
Can it be protected by patent?	No.
Who is the customer?	Existing market for Milford-bound visitors using coaches and motorcar. This market appears to be mature, and significantly smaller than assumed in the Business Plan.

Why should the customer buy the product? What needs does it meet?	Possible travel time savings that depend on the operator's ability to maintain timetable over multiple mode changes. An alternative to coach and car travel offering a different scenic experience than, for example the back country bus. Visitors experience back-country pristine natural environment and three travel modes.
Why is the product better than comparable alternatives?	No evidence is presented on how much potential customers value the positive and negative attributes of the proposed service. Not been tested.
What are the competitive advantages of the new product, and why can a competitor not simply copy them?	The route, high capital cost (of the monorail track) and high whole-of-life cost (of the monorail vehicle) are barriers to entry by competitors.
How does the product reach the customer?	Existing wholesale distribution channels.
Can the product make money? What are the costs involved and what price can be asked?	Monorail operating costs and capital costs are prohibitive compared with low-cost alternatives such as coaches and independent travel.
2. Product idea checklist: Does your business plan answer the following questions?	
What problem(s) does your idea solve? What customer need does it meet?	Travel times for Milford-bound visitors originating in Queenstown. Road congestion. Whether there is a customer need has not been established by underpinning research.
What kind of product or service do you want to sell? What exactly are you offering?	Visitor experience of pristine natural environments. Multi-modal transport experience.
What is innovative about your product or service?	Employing a monorail for part of the journey in conjunction with boat and all-terrain vehicle (which can be experienced now).
How near is the product or service to being unique? How will you protect its uniqueness?	Difficult to assess 'uniqueness' in the absence of market research on what customers value about the proposal, their willingness to pay for those features, and tolerate the negative attributes. There are monorail experiences in other countries but none in NZ
3. Characteristics of an effective management team: Complementary skills and strengths	
Shared vision – everyone wants to succeed in a shared pursuit	Not addressed.
At least three people, seldom more than six	The advisors are listed, as are the intended management team (page 16)
Flexible approach to problems	Applicant's determined on multi-modal experience including a segment of monorail.
Sticks together – especially in difficult situations	No addressed
Doesn't give up in the face of adversity, but reforms and clears the hurdle at the second or third attempt.	Not addressed
Has the team worked together before?	This is not clear from the Business Plan.
Do the members have relevant experience?	No relevant experience in train/transport service but a wealth of experience in property development
Do the founders know their weaknesses, and are they ready to correct them?	Not addressed.
Are the founders clear about their future roles? Is the ownership of the company clear?	Expressly assumed that founders will seek to exit the business once it is capable of being sold down to investors or floated on a public stock exchange (page 17).

Has the team agreed on a common goal, or are there unexpressed differences of opinion?	Not addressed.
Are the individual members fully committed to the undertaking?	Not addressed. Portrayed more as a work group with relevant skills rather than a team with deep mutual commitments.
4. Checklist for business systems and organisations: Does your business plan answer the following questions?	
What does your company's business system look like?	Not addressed.
Which activities within the business system will the company perform and which will it buy in ("make or buy")?	All operating roles other than marketing and distribution internal.
What entrepreneurial functions make up your organisation, and how are they structured?	Not addressed.
What values and standards characterise your organisation (corporate culture)?	Not addressed.
What partners will you work with? What are the advantages of this cooperation, for you and your partners?	Not addressed.
5. Checklist for realisation schedule: Does your business plan answer the following questions?	
As your company grows, what tasks will it need to perform and how can they best be grouped into work packages?	Not addressed.
What are the most important milestones in the development of your enterprise, and by when must you reach them?	Not addressed apart from gaining the required easements and consents from DoC.
Which tasks and milestones are directly interconnected? What is the critical path?	Not addressed.
6. Risk Checklist: Does your business plan answer the following questions?	
What risks can you see that might threaten the success of your enterprise?	Not addressed.
How will you deal with these risks and how will you minimize their impact?	Not addressed.
What is the quantitative effect of the individual risks (scenarios)?	Not addressed.
How would the business survive the worst case?	Not addressed.
7. **Finance Checklist:** Does your business plan answer the following questions?	
What assumptions is your business plan based on?	Partially addresses on page 17. More fully given expression in the implicit and explicit assumptions underpinning the financial model.
How large is the company's capital requirement until break-even? How much cash will be needed in the worst case?	Not addressed.
Where will that capital come from?	Not addressed other than the comment on page 17 about "seed funding to develop engineering and business case" and the need for "large infrastructure funds to develop the project".

What does the deal look like for potential investors?	The horizon over which the financial model is presented is too short to gain a satisfactory understand of the emergence of the business to a steady state.
What return can investors expect?	Business Plan presents a calculation of an internal rate of return that is lower than the level normally expected by private equity providers to start-up businesses.
How will they realize their profits?	Applicants expressly intend to sell down their interest via an initial public offering ("IPO") on a stock exchange or to infrastructure investors.

Our opinion is that the Business Plan is materially incomplete in important respects.

Business Plan scoring

The following chart sets out a summary of the Reviewer's scoring of the Business Plan against what is generally-accepted good practice.

Table 1 Assessment of Business Plan Against Generally-Accepted Good Business Plan Practice

Fiordland Link Experience Business Plan October 2013

Criteria	Business Plan Content	Reviewer's Assessment	Reviewer's Rating		
			Rating	Import-ance	Score
			0,1-5[1]	%	%
The business idea. This comprises assessments of:					
How the intended product or service delivers benefits by meeting genuine customer needs.	Time savings. Reduced road congestion at Milford.	The materiality of the proposed time saving is questionable, as is whether time savings will be valued highly enough by travellers.	3	7.5%	0.23
Potential market size and competitive characteristics.	Business Plan makes assumptions about initial market share and growth which are not accompanied by supporting market research.	Projections for Queenstown tourism used in the Business Plan have not been achieved in recent years.	2	7.5%	0.15
How the product or service is differentiated from its competitors.	The 'experience' of back-country scenery not ordinarily available to travellers from Queenstown to Milford	FLE competes with travellers on the public highway who do not pay the full economic cost of the infrastructure used.	3	2.5%	0.08
The revenue mechanism (prices and costs).	Not specified	Pricing structure is disconnected from opportunity costs of alternatives, and likely response from competitors.	3	2.5%	0.08
Sub-total business idea				**20%**	**0.53**
The management team:					
'Hard' factors (such as previous experience working together, recent relevant experience, mix of skills).	Not specified	The management team has no relevant experience in train system procurement.	0	4.0%	0.00
'Soft' factors such as personal commitments, social skills, temperament, resilience and perseverance.	Not specified		0	2.0%	0.00

Founders' intentions.	Exit after 10 years by IPO or sell down to 'infrastructure investors.		4	2.0%	0.08
Sub-total management team				**8%**	**0.08**
Marketing:					
Can the reader be convinced that a market can be created for the business idea that can be served profitably?	The discussion in the Business Plan is focused on the wider tourism benefit and not on the customer benefits.	No convincing story	**2**	**6.0%**	**0.12**
Deliberate choices to target profitable market segments and erect barriers to competition.	Not presented	Competition is a reality and the bus-based competitors have significant advantages	**0**	**2.0%**	**0.00**
Sub-total marketing				**8%**	**0.12**
Business system & organisational arrangements:					
Activities that need to be performed to produce a product or service and deliver it to customers at the desired level of quality and cost.	Not specified		0	5.0%	0.00
Boundaries of the firm, what to "make" or "buy".	Not specified		0	1.0%	0.00
Proposed organisational arrangements:					0.00
• 'Hard' factors such as organisation charts, role descriptions and operating locations.	Organisational chart showing key positions specified.	Financial model reveals management team & workforce.	3	2.0%	0.06
• 'Soft factors' such as values and culture.	Not specified		0	2.0%	0.00
Sub-total business system & organisation				**10.0%**	**0.06**
Realisation. How the business plan will be turned into reality, milestones and important interdependencies.	Not specified		0	5.0%	0.00
Sub-total realisation				**5.0%**	**0.00**
Risks:					
Arising from the internal operating environment and proposed management countermeasures	Not specified		0	6.0%	0.00
Arising from the external operating environment and proposed management countermeasures	Not specified		0	6.0%	0.00
Sub-total risk				**12%**	**0.00**
Financing:					

A realistic estimate of the amount of capital required and when.	Construction cost estimates based on 2009 preliminary engineering assessment. Costs of deconstructing track (relevant to the surety requirements) and for dedicated electric power supply assets not specified. Monorail operational specifications and procurement arrangements not specified.	It is not beyond possibility that the capital requirement of the as-built project may double (2x) the Business Plan estimate.	2	20.0%	0.40
How much working capital is required?	Not specified		0	2.5%	0.00
How, from where and in what form (e.g., debt or equity) the funds will be obtained.	Not specified		0	10.0%	0.00
Pro forma financial statements	Not specified		0	2.0%	0.00
Description of the core business scenario identifying key financial ratios, the break-even point for cash flow and profitability, the value of the investment and projected return on investment.	The break-even point for cash flow and profitability, and the projected return on investment is presented, but nothing else	Visible horizon for financial modelling is 10 years which is short for a capital-intensive project such as this. Normally the visible period should encompass at the full investment cycle for key capital assets such as the monorail vehicle.	3	2.5%	0.08
Sub-total financing				**37%**	**0.48**
Total				**100%**	**1.3/5**

Notes: 1. Rating scheme: 0 = Not specified, 1 = poor, 2 = not adequate, 3 = adequate, 4 = very good and 5 = excellent

Sources: IDA rating scheme and analysis.

The assessment score using this approach is 1.3 out of a potential score of five. The overall score puts a rating on the Business Plan between 'poor' and 'not adequate'.

Opinion

In the opinion of the Reviewer, the Business Plan:

- Relies too much on assumptions about the potential market for the proposed service that are:
  - Unsupported by market research.
  - Based on old tourism data.
  - Optimistic.
- Does not address all the vital sections of a convincing business plan.
- Relies on an engineering assessment that is:
  - At a preliminary stage and therefore subject to cost increases relating to advancing to an engineering design level.
  - Five years old and therefore subject to cost escalation.
  - Does not appear to assess significant potential project scope elements (e.g., deconstruction, electric power supply infrastructure).

- Demonstrates little evidence of a careful and thorough planning of the transition from a business idea to the successful establishment of a profitable business.

The most pressing needs for improvement of the Business Plan concerns the following:

- Market research on the size and customer's willingness to pay for the service's attributes.
- A more advanced engineering assessment for the monorail track and related works, including deconstruction.
- Specifications for procurement of the monorail vehicle.
- The financial market's appetite for underwriting the Applicant's obligation for reinstatement of the natural environment.

In its current state, the Business Plan cannot be relied upon.

Conclusion

This section assessed the overall soundness of the Business Plan. Based on generally accepted good practice we have assessed the Business Plan as 'poor' to 'inadequate'. The Business Plan cannot be relied upon.

In the next section, we look at what is revealed about the business viability based on the financial modelling that accompanied the Business Plan.

3. Business Viability, Achievability & Risk

Introduction	In this section, we define business viability. We use the definition to test the business viability of the Business Plan. This section also addresses the terms of reference requirement to comment on the achievability of the plan and sensitivity to risk.
What is business viability?	A standalone[8] business is said to be viable[9] when it occupies a place in the market that enables it over the long term to: • Meet its payroll, tax and creditor obligations as they fall due. • Maintain and, when necessary, refurbish or replace its operating assets to maintain its operating capability. • Pay its capital providers returns that meet their expectations. There are many approaches to financial viability metrics (or its reverse, (the potential for) imminent financial distress[10]), but the most comprehensive full-information metric for business viability employs DCF analysis. DCF analysis involves calculating the NPV of projected cash flows using a discount rate that reflects the required return of debt and equity capital providers in proportion to their relative capital contributions. The DCF method makes use of all available information about present and future prospects for a business. In a DCF analysis framework a subject business is said to be viable when the NPV of its projected risk-adjusted free cashflows is non-negative. When the NPV is equal to or greater than zero, the business generates sufficient free cash flow to meet all future operating and capital expenses, and pay investors a return just equal to their weighted-average required return on capital provided.
Testing for business viability	Testing for business viability requires: • Constructing a representative DCF model of the subject business using known and plausible data for calibration over a sufficiently long period to capture a full investment cycle. • Estimating the return required by capital providers and the mix of capital types. • Identifying the plausible combinations of business value drivers that result in a non-negative NPV.

[8] A stand-alone business is independent and receives no financial support from shareholders or other organisations.

[9] Viability means ability to survive. The subject business may not be currently profitable because it is in the early stages of development, undergoing a growth spurt, or going through difficult trading conditions, but there is a reasonable expectation that it will be profitable at some future date. The expectation of future profitability justifies continued investment by capital providers.

[10] For example, the Altman Z-score which is a linear combination of five common accounting ratios, weighted by estimated coefficients, see Edward I Altman, “Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy". Journal of Finance September 1968. A different approach is the Merton Model for assessing credit risk by characterising equity as a call option on subject firm’s assets, see, Richard C Merton, “On the Pricing of Corporate Debt: The Risk Structure of Interest Rates”, Journal of Finance, 29 1974.

What about the 'second mouse'?

Promoters of start-up businesses and ambitious business expansion projects (entrepreneurs) can be forced to abandon before the project reaches viability. This typically results from a lack of critical capability or financial resources, or the overwhelming effect of the complexity of creating workable business systems.

In such cases a buyer may be found for the distressed business and assets who may be able to turnaround the business (by cutting cost, increasing revenue and/or reducing capital employed), or, in combination with another business, realise economies of scale or scope that make the combined businesses viable. This situation is known as the 'second mouse' from the expression *"The early bird may get the worm, but the second mouse gets the cheese!"*

In such cases, the business would be regarded as viable because there is a non-negative NPV represented by the amount that the buyer is willing to pay for the distressed business and assets even if this is less than the original amount invested by the entrepreneur.

This expands on what needs to be tested under business viability, and reinforces the importance of a full-information approach in establishing whether there is a possibility of a second mouse even if the entrepreneur is unable to retain ownership and control the business to the point of viability.

The 'second mouse' test involves investigating whether there is a positive NPV in the operating cash flows after imposing start-up costs as 'sunk costs' on the entrepreneur.

Financial model of FLE

In order to test the viability of FLE business we have constructed a DCF model. The basis for the model is the Business Plan with modifications. The key elements of the model are the following:

- Twenty-five year investment horizon. This is aligned with the expected operating life of the monorail vehicle and catamarans.
- Residual value of the business estimated using the Gordon Growth Model[11] with allowance for replacement of the all vehicles at the end of a 25-year operating period.
- 'Switches' allow detailed scenarios to be evaluated, for example:
  - Market for visitors to Milford from Queenstown.
  - Market penetration 'ramp' and market share saturation level.
  - Fare pricing levels.
  - Number of operating days.
  - Capital cost overruns and electric power infrastructure asset costs[12].
  - Reinstatement bond (based on 85 percent of monorail track construction costs) or surety guarantee (at a 1.75 percent annual fee).
  - Concession fee either as proposed in the Business Plan or the Alternative
- 'What if' analysis of questions relating to financial viability such as:

[11] The Gordon Growth Model assumes the business generate free cash flows forever that grow at a consistent rate. This rate is usually assumed to be very low, usually in line with inflation or GDP growth and is known as the 'continuing growth rate'.

[12] Dedicated electric power supply assets that are specific to a customer's requirements and usually paid for by the customer directly or through a financial arrangement with the electricity supplier.

- What level of patronage makes the subject business viable?
- What is the maximum capital expenditure the business is able to incur and be viable?
- What is the whole-of-life cost of a monorail vehicle?

Figure 1 Screen Shot of Financial Model Switches

Year		Expected	Lower	Upper			2012	2013	2014	2015	2016	2017	2018
Period									0	1	2	3	4
Operational Period	25										1	1	1
Scenario selected	B	55%	380								209	209	209
Peak Market Penetration Scenario	D	20%									21	31	42
Days operating	B	343									343	343	343
Fares Scenario selected	B										90	90	90
DOC Concession Scenario	B	Alternate				PV $m	$2.6	52%			73	93	113
Electricity supply works	Yes	15,000	1	15,000	20,000	20,000	10%	90%	2,000	18,000	0	0	0
Other		2,350	1	2,350	2,840	2,840	50%	50%	1,420	1,420	0	0	0
Total Project works, $000		235,790	4	)	357,566	357,566			138,427	219,139	0	0	0
Capital cost escallated	Yes												
Surety Level Required	100%	of deconstruction costs		85%	of monorail track construction cost								
Underwritten?	No	1							$274,279	$0	$0	$0	$0
Working Capital	Required?												
Working Capital	Yes	1	10%	of initial vehicles inventory					0	2,200	0	0	0

We next highlight key aspects of the approach we have used in the DCF model before presenting results.

Measuring market penetration

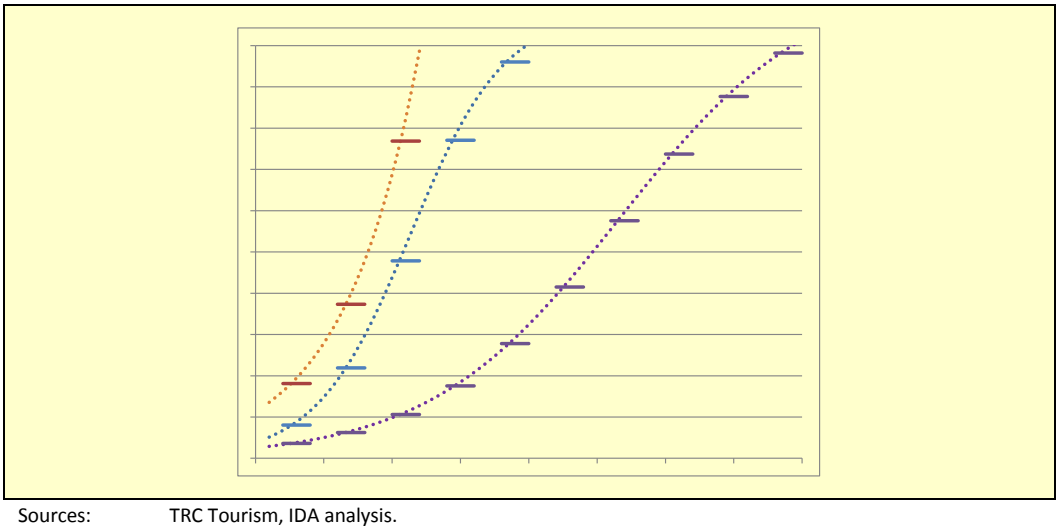
Market penetration is a measure of popularity. Market penetration is one of the four growth strategies of the Product-Market Growth Matrix[13] . Market penetration occurs when a firm enters a market in which current or similar products already exist.

- This is achieved by gaining competitors' customers, or by attracting non-users of the service, or by convincing current clients to use more of your service by advertising or promotion. Business analysts need to model the adoption of a new service. There are several approaches, but a common one is the S-curve.

Figure 2: Examples of Modelled Market Penetration S-Curves

Three, five and eight-year ramps to saturation

The S-curve model focuses on the early phases of the product lifecycle, until maturity is reached



Sources: TRC Tourism, IDA analysis.

The S-curve approach is based on three parameters:

- Saturation, i.e., the maximum expected market penetration after the service becomes mainstream.

[13] See I Ansoff "Strategies for Diversification, Harvard Business Review, Vol. 35 Issue 5, Sep-Oct 1957 and Michael Porter "From Competitive Advantage to Corporate Strategy". Harvard Business Review. May–June 1987.

- Start of fast growth.
- Takeover time. How long it will take the service to 'catch on'. The operational assumption in the formula is that this number of years after the start of fast growth, the product reaches 80 percent to 90 percent of the saturation value and will start to slow down.

Discount rate & cost of capital

A discount rate is necessary to convert cash flows that occur in the future to a present value. Such a discount rate cannot be observed and must be estimated from observable market parameters.

Conventionally the discount rate is calculated as a 'Weighted Average Cost of Capital' ("WACC"). WACC is an average representing the expected return by capital providers on all of a firm's securities. Each source of capital, such as equity shares, preferred shares, subordinated and senior debt are assigned a required rate of return. These rates of return are weighted in proportion to how much each source of capital contributes to the firm's capital structure. The resulting discount rate is what the firm would use as a minimum for evaluating a capital project or investment[14].

The expected returns on debt securities (interest rates) can be observed, the opportunity cost of equity capital must be estimated from market parameters that are observable. This is done using the 'Capital Asset Pricing Model' ("CAPM").

In Appendix A, we set out the calculation of WACC for the Project using conventional models modified for NZ's system of company-shareholder taxation. The estimate of the nominal post-tax WACC is 9.9 percent. This is based on:

- Equity beta of 1.4 derived from NZX-listed tourism and leisure companies.
- Risk free rate of 5 percent.
- Equity market risk premium of 7.5 percent.
- Capital structure, 26 percent debt (average for listed tourism and leisure companies).
- Cost of debt of 8.50 percent.
- Company tax rate 30 percent.

Business Plan valuation

When the model's parameters are set to those presented in the Business case, the Enterprise value (NPV of free cash flows) in constant 2014$ terms is $118 million.

Table 2 Net Present Value of Business Plan in 25-year DCF Model

	Business Plan
Milford Visitors ex Queenstown (ZQN)	450
Peak Market Penetration	77%
Operating days scenario	360
Fare scenario	$180
DOC Concession Scenario	Business Plan
Electricity supply works	No
Capital cost escalated	No
Bond required	0%
Surety underwritten	No
Working Capital	No
Continuing growth rate	0%

[14] Other approaches that derive much higher cost of capital estimates for start-up and transitional firms employ option pricing techniques. See for example 'What's your real cost of capital?' by McNulty JJ1, Yeh TD, Schulze WS, Lubatkin MH. Harvard Business Review, October 2002.

PV of Free Cash Flow, 2014$m	$49
PV of Residual Value, 2014$m	$69
Enterprise value, 2014$m	**$118**

P*rima facie* the business appears viable on the criteria we propose. However, there are material differences between the Business Plan assumptions for the key parameters and realistic values. There are three categories of variation:

- Variation in the cost of supplying the service.

  Adding likely cost overruns (in line with the international experience of train projects) and an allowance for working capital, fewer operating days, and the costs of dedicated power supply assets, the EV range for the Project widens to between negative $41 million and $118 million in 2014$ (excluding a reinstatement bond requirement).

  Our opinion is that the central estimate lies close to the bottom end of the range described. Thus even using the Applicant's own patronage and revenue projections, the cost of the solution is such that the business viability of the Project is doubtful.

- Variation in the estimated patronage and revenue.

  Basing the cost of supply on the most conservative end of the range, and adopting the TRC Tourism's recommended scenario gives an EV range between negative $336 million and negative $441 million in 2014$ (excluding a reinstatement bond requirement).

  Even if $159 million is added back to these figures (representing variation in the cost of supplying the service), they remain such large negative numbers that they indicate the business is not viable.

  Note such large negative EV estimates really have little practical meaning because no rational investor would commit capital to an undertaking in the expectation of destroying large amounts of shareholder value.

- Variation from the cost of meeting likely contractual obligations.

  All landowners affected by the proposed monorail track can be expected to seek reinstatement protection from the Applicant. The cost of to the Project of providing such assurance depends critically on the availability of sureties willing to take on the risk. Not being able to obtain an underwriter for the restitution bond means the Project will need to find $275 million extra capital at the outset, reducing EV accordingly. If the applicant is able to find a surety then the likely cost based on current market rates would be $45 million in 2014$.

The conclusion of this financial analysis is that the Project faces major business viability challenges:

- The biggest challenge is the size of the potential market for the service. In contrast to the Business Plan, which envisages considerable growth in the market (in part stimulated by the Fiordland Link Experience). The actual experience in recent years suggests the market for Milford-bound visitors is mature. Moreover, the analysis presented by TRC Tourism[15] suggests a modal shift is occurring with a secular trend within the overall static-declining market trend of more visitors preferring independent travel.

[15] Note TRC Tourism used commercially sensitive data provided by the Milford Development Authority.

- The next biggest challenge is the likelihood of capital cost overruns as the Project proceeds from preliminary planning to design and construction stages.
- Finally, capitalising the reinstatement obligation given the likelihood that the Applicant will not be able to find a surety.

In the table below we set out a reconciliation of the Business Plan to a Base Case and the implications for the Enterprise Value (in NPV 2014$ terms) of those different values.

Table 3: Adapting Business Plan Assumptions to Base Case

Parameter	Business Plan	Base Case	Impact on NPV
			2014$ m
Business Plane	**As presented**		**118**
1. Business modelling assumptions	Not included in Business Plan model	343 operating days Electric power supply infrastructure Working capital.	-19
2. Capital cost	2009 estimate.	Cost overruns for design scope & construction cost escalation.	-140
3. Market for Milford visitors ex Queenstown	450,000 Milford-bound visitors in 2012 and growing rapidly to the 'horizon'	TRC Tourism recommended scenario 380,000 Milford-bound visitors in 2012, no overall market growth, eight year ramp to 20 percent market share, fares at 'opportunity cost' of coaches	-33 5
4. Net Price to Consumer	$180	Next alternative $90.	-66
6. DoC concession fee	Tapering scale of fees relating to net revenue	Two-part fee comprising: • Access fee at 6.75% of value of land occupied reviewed 5-yearly. • $2 per passenger.	-1
Total changes			**-561**
EV of Base Case			**-$441**

Source: IDA analysis.

Might a 'second mouse' be able to create a viable business after imposing the business establishment costs as sunk costs[16] on the promoter? We have approached this question in the following manner:

- The promoter's business fails after five years just as it is about to break even.
- The business including all property, plant and equipment, leases, easements and regulatory authorities are transferred to another operator (the 'second mouse') for nil consideration.
- The 'second mouse' must meet the same reinstatement bond obligations.

The value of the resulting operating revenue and direct operating cash flows is $61 million (2014$) if the bond is underwritten, or $88 million (2014$) if it is not underwritten. The cost of a surety to underwrite the reinstatement bond is $45 million in 2014$. So a second mouse may be a possibility if there is appetite for

[16] A sunk cost is a retrospective cost that has already been incurred and cannot be recovered.

underwriting the reinstatement risk, but not if the second mouse must put up a bond for the full reinstatement costs.

This leads us to the conclusion that it is very important for the financial market's appetite to underwrite the reinstatement to be understood as part of the Business Plan.

Sensitivity analysis

While financial models are a useful tool to aid decision-making in business development there remain several types of uncertainty to be investigated. Sensitivity analysis can help the Reviewer to determine which the key drivers[17] of a model's results are:

- One-way sensitivity analysis such as the 'What if?" questions posed below, allows an assessment of the impact that changes in a certain parameter will have on the financial model's results. The EV of the project is most sensitive to three drivers (in descending order of importance):
  - Variation in the estimated patronage and revenue.
  - Variation from the cost of meeting likely contractual obligations.
  - Variation in the cost of supplying the service.
- Probabilistic sensitivity analysis provides a useful technique to quantify the level of confidence that can be had in the conclusions. However, such analysis is outside the scope of the Reviewer's brief.

The impression gained by the Reviewer is of the balance of risk is on the downside for the Project, and there is little which adds value to the Project other than a waiver of reinstatement obligations.

What if we are too pessimistic?

What if we are wrong about the potential capital cost escalation and ability for FLE to price at a premium in the market and have the surety bond commercially underwritten? This scenario provides insights into the sensitivity of the results to the business' main value drivers.

Assuming the Project can be completed within the capital cost envelope presented in the Business Plan and price at the proposed levels without effective competitive pressures, it still faces a challenge to its viability from the size of the Milford-bound visitor market. Moreover, without a robust business plan showing rapid progress to generating free-cash flows, finding a surety is not assured.

The monorail is the source of that challenge to business because of the following:

- The high capital cost of constructing the monorail track and providing for its deconstruction and removal.
- The high whole of life operating cost for the monorail vehicle. Direct operating costs are over 90 percent of the whole-of-life-costs for the monorail vehicle while capital costs are less than 10 percent.

Fundamentally, the monorail is a very high-cost solution to moving relatively few people over a short distance. Compared to typical coaches with seat numbers ranging from 20 to 50 seats, the monorail with 160 seats seems a very expensive alternative to about four coaches. Moreover the Applicant is incurring the full capital cost of the

[17] Value drivers are the key elements that either build or protect the value of the business. They determine the current and future value of shareholders' interest and saleability of the business.

monorail track as a ‘sunk’ cost’ while competing coach operators do not face the full capital cost of the roads on which their coaches travel.

Conclusion

The conclusion of our analysis is the proposed business is not viable. Moreover it is not amenable to small “tweaks” that might cumulatively get it across the line.

Fundamental problems with the Project stem from the number of visitors to Milford originating from Queenstown being too small to sustain the costs of providing the service. There is no hard evidence of a customer value proposition to convince the Reviewer that the market will be expanded by offering the experience. The relevant market is mature and the proposed service seems to have fishhooks for customers as well as positive attributes - research could provide answers to where the balance lies but it has not been part of the Business plan development.

Moreover, the extent of the divergence from viability under plausible market and cost scenarios is too great to consider that the business might become viable. It is misconceived to employ a monorail to move relatively few people over a short distance having regard to the high capital and operating costs of such a system.

In the next section, we comment of the concession fee arrangements proposed by the Applicant and propose an alternate arrangement based on a first principles approach.

4. Concession Fee

Introduction

In this section, we discuss the underlying economic and commercial principles for determining concession fee arrangements. We apply those principles to analysis of the fee arrangement proposed by RHL and propose an alternative two-part fee arrangement.

Specifically we have been asked to consider the acceptability of the proposed concession activity fee (including calculations, rates and any other associated concerns that impact on the rate paid).

Proposed concession fee arrangements

In the Business Plan, RHL proposes a fee arrangement calculated as follows:

- The concession fee base is, 26.9 percent of the Applicant's revenue, net of commissions paid to wholesalers.
- The concession rate is a tapering scale of fees:

Concession base	Rate
$m	%
Up to $5	7
Exceeds $5 but does not exceed $10	5
Exceeds $10	1

- The concession payment is calculated by multiplying the concession base by the applicable concession rate.

This proposed fee arrangement is unusual in the respect that it declines as the business revenue grows. Most similar commercial arrangements are either proportionate to revenue or increase as revenue and/or profitability grow.

Based on the Applicant's patronage assumption, the present discounted value of the concession fee to DoC would be $2.6 million in 2014$. It also contrasts with the proposed concession fee arrangements for Mt Nicholas and Te Anau Downs that are a fixed $1 per passenger with an annual cap of at $400,000 and $300,000 respectively.

By comparison the proposed fee to be paid to Mt Nicholas is $3.1 million and $2.5 million to Te Anau Downs (both in 2014$). DoC's share is just under one-thirds of total proposed concession fees.

Property rights framework

The granting of a concession[18] by a public authority entails transferring to the applicant certain property rights in relation to the publicly owned assets. The entailed property rights transferred include:

[18] Public service concessions usually transfer to the applicant an exclusive right to operate, maintain and invest in the development of public utility for a fixed number of years. Examples include water supply and treatment, cable TV, port land and infrastructure. Other forms of arrangement such as lease contract and management contract are related but differ from a concession in the rights of the operator and its remuneration arrangement. A lease gives a concessionaire the right to operate and maintain public assets, but investment remains the responsibility of the grantor. Under a management contract, the operator will collect the revenue only on behalf of the grantor and will in turn be paid a (performance-related) fee (e.g., public transport concession such as for metropolitan rail services).

- Access Rights[19]; and
- (Business) Use Rights[20] (which may include extraction or abstraction rights).

In a pure sense, Access Rights are the right to occupy (and may embrace the right to exclude others) whether or not a business activity is undertaken and profit generated. Use Rights entail the right to undertake and profit by a specified business activity.

'Property', in this context refers not to objects, but to the rights the owner has in relation to the rights of others. Property is established and often reflected in laws or customs that define the conditions under which the owner has these rights (or has them attenuated). Property therefore represents a bundle of rights.

The nature and extent of property rights establishes the power that the owner of the rights may exercise, but also limits or constraints on these rights. There are several dimensions to property rights:

- Exclusiveness - the scope and breadth of the holder's interests or obligations.
- Duration - how long the holder's interests or obligations will last.
- Comprehensiveness - the nature and extent of the benefits or obligations to which the holder is entitled
- Rights to economic benefits and obligations - the extent to which the economic benefits or obligations are circumscribed (by regulations).
- Transferability – the holder's ability to transfer those rights to others.

Note the transfer in this case is a temporary arrangement in that the holder does not receive ownership of the underlying assets in the sense of enjoying the right to on-sell and retain the benefits.

Drawing distinction between Access Rights and Use Rights may seem arcane but the distinction is apparent when the rights are held by different parties such as in mineral exploration concessions where the crown holds the rights to explore and extract, while the landowner holds the right to access.

These distinctions are important, as they are one major consideration in determining the fee arrangement.

Economic or resource rents

Economic rents are "excess returns" above the "normal levels" that are achieved in competitive markets. More specifically, it is "a return in excess of the resource owner's opportunity cost".

An important, albeit contentious, insight in relation to economic rents is that appropriation has no impact on commercial business incentives.

Henry George, best known for his proposal for advocating a single tax on land, defined rent as "the part of the produce that accrues to the owners of land (or other natural

[19] A grant of land or property by a government may be in return for services or for a particular use, a right to undertake and profit by a specified activity, a lease for a particular purpose. A concession may include the right to use some existing infrastructure required to carry out a business (such as a water supply system in a city); in some cases, such as mining, it may involve merely the transfer of exclusive or non-exclusive easements.

[20] In some cases, such as mineral exploration and mining, it may involve the transfer of (temporarily) exclusive or non-exclusive easements.

capabilities) by virtue of ownership" and as "the share of wealth given to landowners because they have an exclusive right to the use of those natural capabilities"[21].

Professors of law Lucian Bebchuk and Jesse Fried[22] define the term "to refer to extra returns that firms or individuals obtain due to their positional advantages". Simply then, economic rents are an excess return achieved where there is no cost of production.

Two sources of economic rents are relevant to analysis of the proposed concession fee:

- Classical factor rent is primarily concerned with the fee paid for the (exclusive) use of natural resources. The classical definition is expressed as any excess payment above that required to induce or provide for production[23].
- Neoclassical Paretian rent. Neoclassical economics extends the concept of rent to include factors other than natural resource rents. Chiefly this is concerned with any excess earnings over the amount necessary to keep the production factor in its current use. Primarily this relates to the returns measured against the opportunity cost of the capital employed in the Project. Put differently this refers to a return over and above the normal return necessary to keep capital employed.

Economic rent may also be thought of as a distribution paid to freeholders for "allowing" production on the land they control. For example:

> "As soon as the land of any country has all become private property, the landlords, like all other men, love to reap where they never sowed, and demand a rent even for its natural produce. The wood of the forest, the grass of the field, and all the natural fruits of the earth, which, when land was in common, cost the labourer only the trouble of gathering them, come, even to him, to have an additional price fixed upon them. He must then pay for the licence to gather them; and must give up to the landlord a portion of what his labour either collects or produces. This portion, or, what comes to the same thing, the price of this portion, constitutes the rent of land ...."
>
> — Adam Smith: The Wealth of Nations 1776

Economic rent is a concept that has been part of resource management policy in NZ for several decades, particularly in relation to the extraction of minerals but also for other resources such as geothermal energy, sand and shingle, and coastal space. While economic rent collection for resources such as petroleum, gold, coal or gas has been relatively straightforward, collection for resources such as coastal space[24], and fisheries has been much more difficult.

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[21] Henry George. "Chapter 11 The Law of Rent" in Progress and Poverty (4th edition). Robert Schalkenbach Foundation 2006.

[22] Lucian Bebchuk and Jesse Fried, Pay Without Performance — the Unfulfilled Promise of Executive Compensation, Harvard University Press, 2004.

[23] For a discussion of the attempt to apply economic rents in the context of the introduction of individual transferable quota (ITQ) in the New Zealand Fisheries Management System, see Tom McLurg, Return to the Nation: Resource Rentals and Cost Recovery, International Institute for Fisheries Economics and Trade (IIFET) 2000.

[24] At enactment, the Resource Management Act 1991 provided for regulations to collect resource rentals in the coastal environment and since 1997 the Act has provisions for collecting coastal occupation charges. However, for a variety of reasons, the implementation of these has not occurred.

At least part of the problem has been confusion over the concepts involved. In some situations, people believe they have ownership and use rights of public assets when in fact the Crown on behalf of the public is the owner. The term 'public' is the source of confusion. Adding to this confusion, economic rent collection is often confused with concepts of 'cost recovery' or charges to correct externalities[25].

Finally, in this context, 'costs' are defined to include a 'normal' return on capital employed. Earning a 'normal' return means the financial reward to entrepreneurialism that these resources would achieve if employed elsewhere in the economy, as well as a competitive return on capital, i.e., what the capital employed would reasonably be expected to earn in other situations. However, because costs already include 'normal profit', economic rent can also be thought of as 'super-profit'.

Unless the resource rent is actually collected, this surplus value will be kept by the business over and above its normal profit as an un-earned windfall gain.

Benchmark concession regimes

Concession regimes are commonplace. They occur in business-to-business settings as well as public service concessions where a business operator occupies and uses assets that remain publicly owned.

In some industries concessions have become a predominant form of organisation. Examples include:

- Seaports (e.g., landlord port arrangements where the port authority grants concession to operators in respect of port land and infrastructure. The operator supplies super structure, stevedoring, and storage).
- Retail and industrial activities at airports.
- Hotel chains (separation of ownership of the hotel asset from the operator).
- Large format mall-style retail.
- Cable television (united States).
- Water (in France).
- Metropolitan rail services.

These examples provide relevant benchmarks for the Project.

A related area is the licencing or permitting of areas for exploration for minerals and petroleum (also called concessions in some countries). Examples include the UK's (Petroleum Revenue Tax (PRT), Norway's Supplemental Petroleum Tax (SPT), Brazil's Special Participation (SP), Australia's Petroleum Resource Rent Tax (PRRT) and Alaska's Production Tax (known as ACES). In the case of UK, Norway and much of offshore Australia no royalty at all is now levied and the countries rely on resource rent and income taxes for virtually their entire share of profits.

A number of countries with tax/royalty regimes include, in addition to company tax, various forms of resource rent taxes to capture a greater share of the economic benefit arising from operations, whether these result simply from highly profitable fields or from windfalls such as high petroleum prices.

[25] Externalities are costs (and benefits) arising from the use of a resource that are experienced by someone other than the user and are neither paid nor accounted for. For example, negative externalities may include habitat loss. When paid for, externalities become business input costs.

Concession fees

When determining the financial arrangements for the proposed Concession, DoC has to address three financial questions:

- How much FLE should be paid by its customers to cover the cost of providing facilities and services under the concession?
- How much FLE should pay for the rights received through the concession?
- How Doc will collect the concession fees?

In many cases, the Concessionaire has the freedom to set its own charges, while in others there are limits to prevent exploitation of the quasi-monopoly created by the concession. Having regard for the competition that FLE will face from other modes of conveyance there is not likely to be a need for DoC to impose any limitation on the charges that the Applicant can make to its customers.

In some cases, grantors use a two-part payment system, combining a fixed annual concession fee and a variable fee relating to use or performance. Performance fees are ideal, but more complex to implement well than simple fee arrangements that link to an independently verifiable metric. In a straight competition between systems based on measuring and counting, counting wins every time.

A system of fees related to a minimum guaranteed throughput creates temptations to redefine the terms of the concession every few years to gain more revenue. The system is sensitive to renegotiation, and as such decreases the legal certainty of the concession agreement in the eyes of the concessionaire.

Another type of concession payment relates to revenue sharing such as we see in NZ in dairy share milking arrangements. Examples of concessions within another business are concession stands within sporting venues and theatres, and concessions in department stores and hotels.

Alternate concession fee proposal

We propose an alternate two-part concession fee arrangement that will relate more closely to the property rights transferred by DoC to the Applicant, and align their incentives. The basic structure is as follows:

- An occupation charge for the area of land granted under the easements and leases sought. The area sought by the Applicant is roughly 588 hectares. The DoC estate has an average land value at 30 June 2013 of $650 per hectare. Thus the Applicant's easements and leases would relate to land with an (unimproved) value of $382,000. The following table shows the terms of typical ground lease arrangements in NZ and the resulting annual payment required of the Applicant for differing review frequencies if this benchmark was applied.

  Table 4: Ground Lease Payments Benchmarks

	Entailed area ha	Land value $/ha	5-year review term	10-year review term	21-year review term
Rental rate, %			6.75%	7.50%	9.00%
Annual payment, $	588	650	25,780	28,645	34,374

- A participation charge calculated as the present value of the Applicant's estimate of the level of resource rent it would earn divided by its expected patronage. This is about $2 per passenger. The following table show the calculation of the $2 per passenger charge:

Table 5 Resource Rent-Based Passenger Charge

		2016	2017	2018	2019	2020	2021	2022
		$m	$m	$m	$m	$m	$m	$m
EBITDA		25.1	30.0	34.4	39.1	43.4	50.5	56.9
add back proposed fees		0.2	0.2	0.3	0.3	0.3	0.3	0.3
Adjusted EBITDA		25.3	30.2	34.7	39.4	43.7	50.8	57.2
Average capital employed		241.5	241.5	241.5	241.5	241.5	241.5	241.5
Plus working capital, months)		2.4	2.6	2.7	2.7	2.8	2.9	2.9
Other								
Total capital employed		243.9	244.1	244.2	244.2	244.3	244.4	244.4
Of which debt	26%	63.5	63.5	63.5	63.6	63.6	63.6	63.6
Equity		180.4	180.5	180.6	180.7	180.7	180.8	180.8
Debt service	8.50%	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Tax depreciation	5%	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Taxable income		25.3	30.2	34.7	39.4	43.7	50.8	57.2
Tax	30%	7.6	9.1	10.4	11.8	13.1	15.2	17.2
NPAT before royalty		5.7	9.1	12.2	15.5	18.5	23.5	28.0
Cost of capital	9.9%	24.1	24.1	24.1	24.1	24.1	24.1	24.1
Cumulative EVA		-18.4	-33.4	-45.3	-54.0	-59.6	-60.2	-56.4
Interest cover		2.5 x	3.4 x	4.2 x	5.1 x	5.8 x	7.2 x	8.3 x
Royalty on EVA		0.0	0.0	0.0	0.0	0.0	0.0	3.8
Levelised Royalty		0.74	0.74	0.74	0.74	0.74	0.74	0.74
PV passengers, 000	1,837							
per passenger, $	**$2.00**							

Thus the alternate concession fee proposal is a market-value based occupation charge of 6.75 percent and a per-passenger charge of $2. We propose these charges should be reviewed five-yearly. The occupation charge should be payable monthly in advance.

The business use charge could be paid monthly in arrears on the 20th following the month in which the passengers used the service.

The alternate fee proposal delivers revenue to DoC with a present value of $4 million in 2014$.

Conclusion

The Applicant's concession fee proposal is unusual in that the rate of concession payment declines with revenue growth. No rationale for this proposed arrangement is presented by the Applicant.

A more usual, principles-based approach is to base the concession payment on the value of the property rights transferred under the concession arrangement. Our alternate concession fee proposal is a two-part charge, as follows:

- An occupation charge calculated at 6.75 percent of value of land occupied under the easements sought, reviewable five-yearly, payable monthly in advance. The estimate value of ground rent payable per annum in the period before the first review is $25,780.
- A business use change of $2 per passenger payable monthly in arrears.

In the next section, we discuss arrangements to protect the public interest in the event of abandonment of the Project.

5. Reinstatement Bond & Sureties

Introduction	In this section, we discuss the requirement for the Applicant to capitalise the cost of restoring the natural environmental if the Project is abandoned. DoC has a responsibility to ensure that "the integrity of New Zealand's indigenous ecosystems" is maintained as far as possible, as well as a role in "supporting tourism". Consistent with this responsibility, the Department is seeking arrangements with the Applicant to protect the public interest if the Applicant abandons the Project and no suitable replacement operator can be found to take over the business. We comment on mechanisms to protect public interest and ensure that resources are available to reinstate affected areas to their natural state. In particular, this section considers how the sureties might be calculated during: • The construction period; and • The balance of the concession term. Sureties can be provided in many ways, but broadly they are either a bond or an underwriting arrangement. Fidelity funds are another approach.
Public policy rationale	The public policy rationale that justify specific business failure risk mitigation provisions in the concession agreement, include the following: • Information asymmetry and complexity because of the potential moral hazard that could arise because DoC is the less knowledgeable party about the Applicant's performance intentions and lacks the ability to retaliate for a fundamental contract breach. • Externalities or spill over effects where annual fees charged (to the Concessionaire) do not fully reflect the end-to-end costs (and benefits) a product or service (e.g. environmental remediation). • Split incentives, such as where different parties bear the costs and benefits. This is most possible if the Project becomes unprofitable at any stage, or toward the end of a non-renewing concession term, when the Concessionaire has the incentive to 'harvest' the asset. In an extreme case the Applicant's incentives may be to abandon the Project and leave the DoC with a stranded asset and the restoration cost.
Cost of restoring the natural environment	The Business Plan does not address the cost of decommissioning, dismantling/deconstruction and removal of the monorail track and service road. No engineering assessment of this aspect of the Project is presented. As commented elsewhere, in the absence of an engineering assessment of the deconstruction and removal we have used the 'as-built' construction cost estimate, offset by 15 percent for the scrap value of recycled materials, as a working estimate of the remediation cost. The estimates of construction costs for the monorail track are between $210 million (Business Plan) and $323 million. Thus, the requirement for sureties is between $180 million and $275 million.

DoC should seek a bond for a proportionate share of this amount, and adjust it annually in line with changes in the relevant PPI series. Every 10 years the surety requirement should be reviewed to ensure it covers an assessed cost of deconstruction, removal and restoration. If the proportionate share is based on track length within the conservation estate then DoC should require 67 percent or $120 million to $180 million to be provided.

In addressing the requirement for sureties, we have worked on the basis that the other landowners will require the same as DoC against the risk of abandonment. Such 'make good' provisions are usual in commercial lease arrangement.

What are sureties?

A surety is a person who agrees to be responsible for the obligation of the Concessionaire to perform under the concession arrangement. The requirement for sureties addresses the risk of default by the Concessionaire.

Sureties[26] can be provided in many ways such as:

- A bond.
- An underwriting arrangement.
- A fidelity fund.
- Combinations of the above that may change in emphasis over time.

Either of the first two arrangements listed above will protect DoC and the Crown.

We do not favour a fidelity fund arrangement because this would only provide the required level of protection after a number of years. For a fidelity fund to be fully protective it would need to be supplemented in the early years by a bond or underwriting to cover the exposure in the intervening period. Such a double up of cost would be unattractive to the Applicant. Like a bond, a fidelity fund is refundable if not called.

There is an active market in providing sureties in NZ to meet a variety of requirements in business-business and business-to-government situations. Most typical are bonds and underwriting via a (bank) letter of credit:

- Posting a bond is most costly for the Applicant since the opportunity cost of the capital employed typically exceeds the fees changed for underwriting.
- Fees charged for a letter of credit or guarantee is typically in the range 1.5 percent to 2.5 percent per annum of the face value amount underwritten. A typical fee is around 1.75 percent per annum[27].

Thus, the expected annual cost to the Applicant of an under-written bond would be in the range $3 million to $4.8 million.

We note, however that underwriters in NZ generally will not provide an underwrite in relation to a start-up venture on a non-recourse basis unless there is a robust business plan that shows strong positive operating cash flows within two-three years of commencement. Even if that is the case they may also seek recourse to the shareholders as additional protection in the event of a claim (as there are no business

[26] Sureties are different from insurance, which is a means of obtaining indemnity against a future occurrence of unpredictable events called "perils". Perils include Acts of God (events outside human control such as floods) and Acts of the Devil (arson or theft etc.). Claims and loss handling is the actual "product" paid for through the purchase of insurance. The risk of peril is shared amongst the pool of policy holders, the shareholders and re-insurers of the underwriter.

[27] Sourced from personal communications with NZ banks, bonding agent and underwriters in January 2014.

assets to repay the claim amount). As the Business Plan stands now, the applicant would have difficulty persuading an NZ-based underwriter. Underwriters are generally shy of exposure to demand risk, which is why PPP projects where the government carries such risk are enjoying popularity now.

In agreeing to an underwriter assuming the risk instead of a bond, the Crown needs to be comfortable with the credit risk. It should apply its normal credit criteria in assessing the suitability of the underwriter.

Sureties during project phases

The Project has two phases:

- A 30-month construction phase.
- An indefinite commissioning and operating phase.

To protect the Crown, the surety at all times needs to be large enough to meet the costs of demolition/deconstruction and removal of the works that has been installed, and restoration of the natural habitats.

An approach is to require an up-front lodgement of one-third of the estimated amount to be topped up monthly or quarterly as work progresses to completion. Under this arrangement during the construction phase the surety is always in advance of the works, and unaffected by any retentions at practical completion.

During the operating phase the amount of surety should be periodically reviewed in line with changes in construction costs to ensure it is never less than a current estimate of restoration costs.

A potential review mechanism might be to link the surety requirement for each year ahead to movements in a relevant cost index such as the Producers Price Index (PPI) for heavy and civil engineering[28], and every ten years perform a 'zero-based' assessment of deconstruction, removal and restoration costs.

Conclusion

There are public policy grounds for requiring the Applicant to provide surety against the risk that it may not be able to perform its reinstatement obligation. Information asymmetry and complexity, externalities and split incentives (where different parties bear the costs and benefits are the heart of that viewpoint.

The level of surety required should match current estimate of the cost of demolition/deconstruction, removal and restoring natural habitats. In the absence of specific engineering assessment we suggest using the estimate construction cost reduced by 15 percent for the scrap value of recycled material as a working estimate. The requirement for sureties is between $180 million and $275 million.

DoC should seek a bond for a 67 percent proportionate share of this amount, and adjust it annually in line with changes in the relevant PPI series. Every 10 years the surety requirement should be reviewed to ensure it covers an assessed cost of deconstruction, removal and restoration.

As the Business Plan current stands, we think the Applicant will find it difficult to give an underwriter confidence to take on the risk as a substitute for a bond.

In the next section, we focus on the estimate construction costs presented in the Business Plan.

[28] PPI Inputs, Industry Group EE12, Heavy and civil engineering construction, series SQNEE1200.

6. Construction Costs

Introduction

In this section we focus on the estimated construction costs of the proposed 43.8 km monorail track (and associated access road and spurs), 29.4 km of which is within DoC administered land, and terminals.

The Business Plan presents an estimate of $210 million (in 2009$) based on an engineering assessment undertaken in 2009 by Opus[29]. The draft Construction Management Plan (3 November 2011) also refers. The civil works associated with the monorail track is the major component of the total estimated initial capital expenditure on the Project of $243 million (2009$).

Of secondary consideration is the procurement of a single articulated 160-seat straddle monorail vehicle with an estimate cost of $13 million. The Business Plan also isolates $8.7 million for the construction of four terminals Queenstown, Mt Nicholas Wharf, Kiwi Burn and at Te Anau Downs.

Specifically we have been asked to provide an assessment of whether construction costs are likely to be realistic given the scale, type and location of the construction works and what a realistic value for this would be.

The expected initial capital cost of the monorail track, and the whole-of-life costs of operating the monorail vehicle are significant factors in the determination of the Project's feasibility and business viability.

Monorail

The monorail component of the Fiordland Link Experience consists of the following:

- A 43.8km long monorail track within a six-metre wide footprint (29.4km within the Conservation Estate managed by DoC).
- A three metre wide construction track along the length of the monorail route. This is to be retained as a service access road and made available as a mountain bike track.
- Spur tracks three metres wide to connect the construction track to the monorail route for construction access. After construction most of the spur tracks will be substantially rehabilitated other than, those retained for emergency management.
- Terminus and facilities:
  - At Kiwi Burn.
  - At Te Anau Downs.

The total cost estimate for these elements is shown in the Business Plan as $217 million 2009$. Non-residential construction costs in NZ did not increase between 2009 and 2012, so this is also a reasonable preliminary planning cost estimate in 2012$.

Route plans, foundation and pier construction are not yet confirmed. The exact route, and length are yet to be finalised, and are not planned to occur until after the concession is granted. The Applicant has not sought an interim investigation licence to enable further engineering assessment to be undertaken.

[29] Opus International Consultants Limited – Preliminary Engineering Assessment of Monorail Proposal, September 2009. See Appendix E of the Concession Application.

An easement has been sought over a 200 metre-wide corridor (except adjacent to the Upukerora River where a 300m wide easement is sought to allow for construction around a slip). This width would accommodate the monorail and the construction/mountain bike track and has been proposed for three reasons:

- To provide a visual and experiential separation from the monorail, expected to be typically 70 to 80 metres in flat terrain.
- To provide some design and construction flexibility to suit topographic features, such as streams, gullies, steep banks, large trees or ecologically significant sites.

The Opus report recognises that further work will be required as the monorail proposal develops. Key aspects requiring further consideration as part of the detailed design phase of the project include:

- Monorail track alignment, to be developed in conjunction with a to-be-selected monorail supplier and a to-be-developed ground model.
- Access/mountain bike track standards and location to suit construction and operation.
- Geotechnical investigations, especially in the areas of difficult topography.
- An environmental site management plan including further development of erosion and sediment control measures.
- Development of monorail operational requirements.

A 30-month construction period is proposed on the basis that the construction of the foundations and piers is independent of the erection of the monorail beams and that the construction would proceed on three fronts concurrently. Beams, piers and foundation pads would be precast off site and components would then be transported to the depots by truck and trailer.

How much does monorail cost?

Unfortunately there is no simple answer. Not enough straddle monorail systems are built for there to be standard costs. We can identify 65 monorail systems currently operating, 51 not currently operating, eleven in construction and 62 proposed systems at varying stages of development.

Those straddle monorail systems that are built are mostly situated in densely populated urban environments to provide mass passenger transit services in replacement for more expensive underground rapid-transit systems. Many variables influence the cost of building a monorail system (and most forms of rail transit). Factors include the following:

- Total length of the track. Per kilometre costs can be reduced the for longer track systems.
- Topography.
- Location, i.e., access for construction equipment and other impediments to construction such as surface traffic, relocation of water mains, power and telephone lines can have a significant effect on costs.
- The amount of land needed or easements to be acquired.
- Passenger requirements, i.e., size and number of vehicles are required, seating, air conditioning and toilet requirements. Wait times at stations.
- The speed requirements of the system. For example are there long enough distances between stations so that a higher speed is desirable.

- Number of stations: Each additional station adds cost.
- Special structures, e.g., tunnels, bridges, urban structures, heritage or other special values to be protected?
- Geotechnical conditions, subsurface conditions can have a major impact on foundation design and placement costs, as will mitigation of construction impacts on waterways, dust etc.
- Environmental, e.g., flora restoration, fauna protection, sound walls or visual impact stipulations.

Straddle monorail, compares favourably on the cost dimension to other rail transit systems such as underground or surface light or heavy rail.

Table 6: Sample of Construction Cost of Straddle Monorail Systems[30]

System	Cost US$/km	Year	Source	Status
FLE				
Business Plan	3.2	2016		Proposed
Escalated cost	4.6	2016		
Hitachi	15.0	1964	Tokyo-Haneda	Operating
Hitachi	62.0	1985	Kitakyushu	Operating
VSL (refurbished Mk IV)	15.5	1995	MGM-Bally's	Replaced with Bombardier
Hitachi	27.0	2003	Okinawa	Operating
Kuala Lumpur Mtrains	36.0	2003	Kuala Lumpur	Operating
Bombardier Mk VI	54.7	2004	Las Vegas	Operating
Hitachi	73.4	2006	Palm Jumeirah	Operating
Metrail	20.0	2008	Metrail	Operating
Roawan Urnanaut	10.3	2008	Rowin	Construction 2008
Scomi	27.3	2008	Mumbair	Construction 2008

	Whole sample US$/km	Most recent US$/km
Mean	34.1	19.2
St dev	20.8	6.9

Sources: The Monorail Society, Japan Monorail Association. FLE, IDA analysis.

What stands out in the above table is how low the cost estimate is when compared with the limited sample of systems where construction costs are available.

Of the factors listed above, Project costs will benefit from track length, few construction impediments other than winter weather conditions, and few stations. On the other hand, the remote location and sensitive environment will increase construction costs. However much is unknown having regard to the early stage of the engineering assessment on which the Business Plan relies. The conclusion for the

[30] The nearest comparable straddle monorail system we can identify is the Osaka Monorail operated by Osaka Monorail Co., Ltd. The Main Line runs on an elevated track between Osaka International Airport and Kadoma. It first opened in1990 and in 1997 reached its current fullest extent of 28 km. A trip over the entire Main Line takes about 36 minutes, and costs ¥540. The vehicles are powered by a 1,500 volt DC supply and are capable of a top speed of 75 kph. There are 18 stations on the two lines and the system has over 100,000 daily boardings. Unfortunately construction costs could not be obtained at the time of writing.

reviewer was that ample scope exists for the as-built cost of the proposed monorail system to exceed the preliminary planning estimate.

What are cost overruns?

Cost overruns occur when actual project costs exceed previously estimated values. This is a straightforward concept, although the sources of overruns can be confusing:

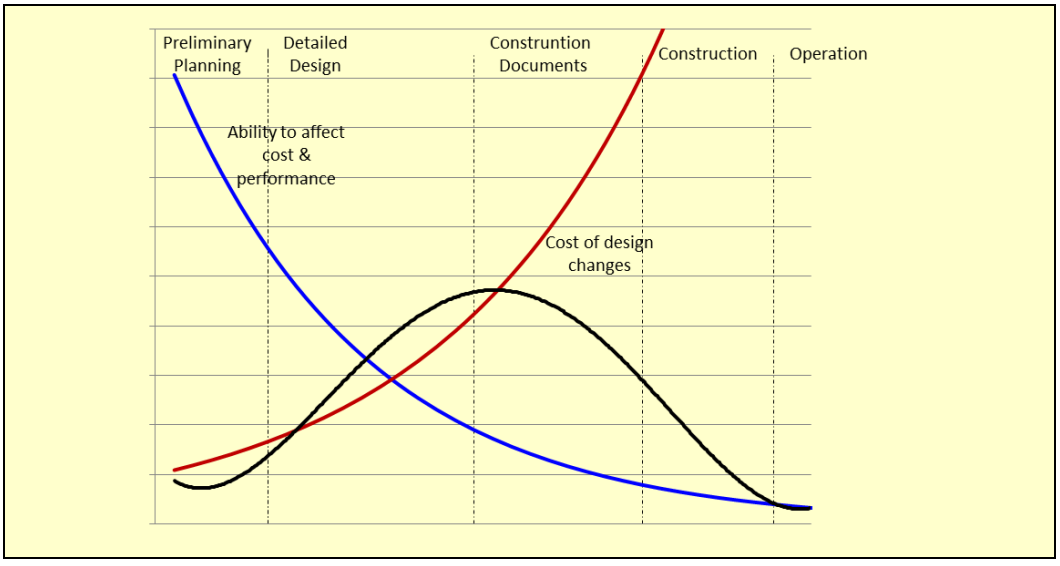
- Nominal cost escalation includes the effect of price changes specific to the project and includes general price-level change due to the reduced purchasing power of money.
- Real cost escalation arises from changes to the scope of works, design changes necessitated by both actual working conditions, and changes to optimise the as-built design.

Another clarification is necessary before cost escalation can be understood. Different types of cost estimates are done at different stages in the development of an engineering project. The period before a specific project alternative has been chosen referred to as the 'conceptual' or 'preliminary planning' stage of a project. Cost estimates which are done in the preliminary planning stage have a level of detail much less than the estimates done at the subsequent the design phases, or later in response to actual tender submissions from potential contractors and materials suppliers.

Thus, planning estimates can be expected to be less precise than design estimates, which are less precise than bids. As a result, caution must be taken when comparing the amount of cost escalation of different projects. To make a valid comparison, the cost estimates used must be taken from the same stage of project development.

Moreover there are reasons why cost estimate vary at different stages of planning, design, tender and construction. This is demonstrated in the following chart.

Figure 3: Influences on Engineering Costs at Project Stages



As an engineering project progressed through stages from planning to detail design, contract documentation, construction and operation, the ability to affect costs and performance (blue line) declines while the cost of making design changes escalates (red line).

Engineering workflow peaks during construction documentation.

Sources: IDA.

What the chart illustrates is the ability to make changes at modest costs is highest during the preliminary planning stage, but drops away dramatically as options are closed off and work progresses on detailed designs and documentation. Once a project is built, the ability and cost to make changes is limited and expensive.

The costs associated with changes, meanwhile, rises exponentially as more work is done by the engineers. During actual construction where changes to what is build require demolition and the cost rises exponentially.

Engineers may be criticised for being 'bad' at estimating, but such criticism is unfair. Construction cost estimates made at different stages of the project are done on the basis of different levels of general knowledge, as opposed to specific knowledge about the proposed design and the construction and operating conditions. Specific knowledge is costly to acquire, especially in projects with a significant component of civil works. Even with geotechnical survey information, there remains uncertainty about ground conditions that can materially affect construction costs up until the time that excavations are complete.

Cost overruns in transport projects

Enormous sums of money are spent on transport infrastructure projects around the world, yet surprisingly little research exists about the costs and risks involved.

Casual observation suggests that cost overruns and delays associated with transport infrastructure projects are commonplace, and large, which implies a significant element of inherent commercial risk for a business undertaking such a project.

Flyvbjerg et al (2003)[31] examined the cost of 258 projects worth approximately US$90 billion (1995$) over seventy years, including 191 projects of roughly the same scale as the Project. This is the largest sample of transport projects with data on cost that has been collected. It provides evidence of the experience of cost overruns.

For 58 rail projects (high-speed; urban; and conventional, inter-city rail), the mean cost escalation was 44.7 percent (with a standard deviation of 38.4 percent). Rail cost escalation is 34.2 percent in Europe versus 40.8 percent in North America. For roads, the similar numbers are 22.4 versus 8.4 percent. The researchers were able to conclude that project type matters. Based on the available evidence they concluded that rail projects appear to be particularly prone to cost escalation, followed by fixed links. Road projects appear to be relatively less predisposed for cost escalation. Cost escalation for rail is more than twice that of roads. The explanation offered by the researchers is simply that more roads are built than rail systems and fixed links. Engineers have better understanding of standard costs at the preliminary planning stages for roads than for rail and fixed links. For all three project types, the evidence shows that it is sound advice to take any preliminary estimate of construction costs with a grain of salt, especially for rail projects.

Additionally, they concluded that risks generated from misleading cost estimates are typically underplayed in early decision-making. Risks, therefore, have a double negative effect since it is one thing to take on a risk that is calculated and undertaken voluntarily 'with open eyes' (as do insurance companies and professional equity investors), while it is quite another matter ignore risks, especially when they are of the magnitudes identified. Moreover those whose business is financing infrastructure in the private sector are alert to potential loses and in an effort to protect themselves, they place the risk of cost escalation, and related risk assessment and management, at the core of their decision-making.

[31] "How common and how large are cost overruns in transport infrastructure projects?" by Bent Flyvbjerg, Mette K. Skamris Holm and Søren L. Buhl, Department of Development and Planning, Aalborg University, Denmark.

Construction cost estimates	Based from the preliminary planning assessment undertaken by Opus we have made estimates of the as-built construction costs, as follows: • We could not identify an allowance for electric power reticulation assets necessary to supply electricity to the monorail track. Based on similar capacity requirements for high-voltage DC supply, and the likelihood of a requirement to heat the beam during winter operating hours, we have included an allowance of $15 to $20 million for dedicated power infrastructure assets. • Using the methodology set out in Flyvbjerg et al we have estimated the likely cost overruns of the train-related civil works to be in the range of 34 percent to 45 percent. • For other capital costs we have indexed the figures in 2009$ to 2015/16$ using actual construction costs indexes and forecasts published by the New Zealand Institute of Economic Research[32].
Deconstruction cost estimates	The Business Plan does not address the cost of decommissioning, dismantling/deconstruction and removal of the monorail track, service road and consequential environmental restoration. As noted elsewhere, in the absence of an engineering assessment of the deconstruction and removal we have used the 'as-built' construction cost estimate, offset by 15 percent for the scrap value of recycled materials, as a working estimate of the remediation cost. The estimates of construction costs for the monorail track are between $210 million (Business Plan) and $323 million. Thus, the deconstruction, removal and restoration costs are likely to be between $180 million and $275 million for the entire monorail track $3.7 million to $5.7 million per km). In making, this assessment we have reflected that demolition of the structures is unlikely to be acceptable to DoC and deconstruction costs double demolition costs For comparison, the cost of dismantling the Sydney monorail was a little over $6 million per kilometre.
Conclusion	Capital cost overruns and delays associated with transport infrastructure projects are commonplace, and large, which implies a significant element of inherent commercial risk for a business undertaking such a project. The construction cost estimate presented in the Business Plan is old, and based on a preliminary planning assessment of the engineering requirements. Based on experience with rail infrastructure projects, cost overruns can be expected in the range 34 percent and 45 percent. In our modally we have used the higher figures, which are still low by comparison with per-kilometre construction costs for straddle monorail systems installed overseas.

[32] See RLB Rider Levett Bucknell "New Zealand Trends in Property and Construction" no 68, Second Quarter 2013, prepared by NZIER.

Appendix A Cost of Capital Employed

Introduction

In this appendix, we present an estimate of the cost of capital employed in the Fiordland Link Experience. This estimate is used as the discount rate for converting future dollar amounts to present discounted value.

One of the hardest concepts in corporate finance is the weighted-average cost of capital. WACC is the minimum return that a business must earn on its existing asset base to make a satisfactory return (interest, dividend, and capital appreciation) for its creditors, owners, and other capital providers.

Capital providers seek to earn a return that at least compensates them for the investment risk they take. Different securities generate different returns reflecting differences in their riskiness (probability and consequences of default). WACC is calculated taking into account the relative weights of each component of the capital structure of a typical firm in the relevant industry segment[33].

Since WACC measures the expected (opportunity) cost of new capital, we use market values of the components, rather than their book values (which can be significantly different).

Below we show the formula in action to estimate the WACC FLE.

Table 7 :Estimate of Nominal Post-Tax WACC

Source: PwC 'Appreciating Value, Edition No. 4, September 2013'

Nominal Post-Tax WACC	**9.9%**	R_e E/(D+E) + R_d (1 - T_c) D/(D+E)
Based on		
Equity beta, β_e	1.40	β_e
Asset beta, β_a	1.03	β_e E/(D+E)
Debt beta, β_d	0.47	Debt premium / (E[R_m] - R_f)
Risk free rate, R_f	5.00%	R_f
Estimated debt premium	3.50%	k_d - R_f
Cost of equity, K_e	11.25%	R_f (1- T_c) + β_e (E[R_m] - R_f)
Cost of debt (pre-tax), k_d	8.50%	R_f + β_d (E[R_m] - R_f)
Equity market risk premium	7.5%	E[R_m] - R_f
Capital structure D/(D+E), %	26.0%	D/(D+E)

The methodology is from Martin Lally, 'The CAPM Under Dividend Imputation', Pacific Accounting Review, 1992, and 'The CAPM under Dividend Imputation and International Portfolio Selection', Pacific Accounting Review 1996.

'Appreciating Value, Edition No. 4 September 2013' published by PricewaterhouseCoopers New Zealand was the source for the following parameters:

- Equity beta. Average of the NZX-listed tourism and leisure companies.

  All else being equal, the WACC of a firm increases as the "beta" and required rate of return on equity increases. Beta measures how much a firm's share price reacts against the market as a whole. A beta of one indicates that the firm's value moves in line with the market. If the beta exceeds of one, the firm's value is exaggerates the market's movements; less than one means the firm's value is more stable.

[33] Calculation of WACC for a firm with a complex capital structure is a laborious exercise. Other complications arise where the firm is a cooperative with untraded equity or has a non-standard tax status.

- Equity market risk premium (EMRP).

  EMRP represents the return investors expect to compensate them for taking extra risk by investing in the share market over and above the (default) risk-free rate. In other words, it is the difference between the risk-free rate and the market rate.

- Risk-free interest rate.

  Risk-free interest rate is the theoretical rate of return of an investment with no risk of financial loss. In a CAPM context, it is compensation for 'systematic risk' which cannot be eliminated by holding a diversified portfolio.

- Capital structure. Average of the NZX-listed tourism and leisure companies.

  Note this is not a recommended or target capital structure for the Project. Instead it represents the average for the sector and what investors in tourism and leisure would experience.

The cost of debt estimate was obtained from private conversations with the corporate banking arms of leading NZ banks.

Appendix B Terms of Reference Acquittal

Acquittal

This appendix demonstrates how we have fulfilled the terms of reference for this assignment

Review the financial viability of the venture and the overall soundness of the business plan for Fiordland Link Experience and specifically to consider:	Financial viability reviewed in Section 3. Soundness of the Business Plan assessed in Section 2. In its current state, the Business Plan cannot be relied upon. Improvements required include: • Market research on the size and customer's willingness to pay for the service's attributes. • A more advanced engineering assessment • Specifications the monorail vehicle. • The financial market's appetite for underwriting reinstatement obligation.
(i) the viability of the business by assessing the projections for size of market, number of passengers, revenue, operating costs, profitability and ability to service debt	Section 3. The Reviewer's conclusion is that as a business the Project is not viable. Fundamental problems stem from visitors to Milford are too few to sustain the costs of providing the service. There is no hard evidence the market will be expanded by the project. Moreover, the large divergence from viability under plausible market and cost scenarios is too great to consider that the business might become viable.
(ii) the achievability of the plan	Section 3. The project is not achievable as a stand-alone commercial venture.
(iii) risks in achieving the plan	Section 3. The main risks that the Project's commercial value is sensitive to are: • Market for visitors to Milford, patronage and revenue. • Reinstatement bond requirements. • Capital costs.
(iv) acceptability of the proposed concession activity fee (including calculations, rates and any other associated concerns which impact on the rate paid)	Section 4. We proposes an alternate two-part concession fee related to the value of rights transferred under the concession.
(v) Mechanism for example a bond to protect public interest and ensure that the PCL is returned to	Section 5. An engineering assessment and cost estimate for reinstatement need to be made.

its natural state should the venture prove unsuccessful. In particularly to consider how that might be calculated over both the construction period and the life of the asset.	In the meantime we have used a net cost of 84 percent of the construction costs as a guide to the likely reinstatement cost. DoC should seek and maintain a bond for the estimated costs of deconstruction, removal and reinstatement of the natural environment.
(vi) Assessment of whether construction costs proffered by the applicant are likely to be realistic given the scale, type and location of the construction works (including all rolling stock etc. to establish an operational business) and what a realistic value for this would be.	Section 6. The monorail capital cost estimate is low by comparison with the limited sample of similar systems where construction costs are available. Project costs will benefit from track length, few construction impediments other than winter weather conditions, and few stations. On the other hand, the remote location and sensitive environment will increase construction costs. However much is unknown having regard to the early stage of the engineering assessment on which the Business Plan relies. Capital costs estimate do not appear to allow for dedicated electricity infrastructure, and do con consider deconstruction, removal and reinstatement cost.
The review will include sensitivity analysis, including for changes in revenue assumptions and construction costs.	Section 3.