

BOARD PAPER

Paper no:	2018/11/1296
Meeting date:	9 November 2018
Prepared by:	Richard Hancy, Project Director, Light Rail
Recommended by:	Brett Gliddon, General Manager System Design & Delivery
Board function:	Significant planning, investment and operational matters
Subject:	Auckland Light Rail: City Centre to Mangere – Business Case and Procurement Strategy

It is recommended that the NZ Transport Agency Board resolves to ...

- **Endorse** a route between Queen Street in the city centre and Auckland Airport in Mangere, including on street running along Queen Street, Dominion Road, Princes Street (in Onehunga), McKenzie Road, Bader Drive, and Westney Road.
- **Endorse** that the project is for conventional light rail vehicles on steel wheels and on a predominantly at-grade alignment along both on street and off street sections.
- **Note** further work be done into value creation and capture opportunities, with a report back to the 14 December 2018 Board meeting.
- **Endorse** that major stakeholders be immediately engaged to negotiate Stakeholder Agreements in relation to the scope, timing and financial contributions to the project, with Agreements to be finalised and signed by the end of 2020.
- **Note** that the project is expected to cost in the range of \$3,300 million to \$4,200 million (Percentile 50 to Percentile 95) (Unescalated, 2018 \$NZD), with a Benefit Cost Ratio (G) of 1.1.
- **Approve** \$30 million in Pre-Implementation funding, to progress further investigation and design work to support applications for planning approvals.
- **Approve** \$120 million in Property funding, to initiate the start of property discussions, particularly in relation to the Depot.

Continued...

It is recommended that the NZ Transport Agency Board resolves to ... continued

- **Endorse** the Procurement and Delivery Strategy, comprising a combination of three Early Works packages and a Main Works package made up of the following:
 1. **Major Utilities** investigation and relocation package, delivered in sub-packages through collaborative risk sharing models, such as Early Contractor Involvement (ECI) and Pure Alliances. (The Auckland Unitary Plan allows for these works to be undertaken ahead of any special legislation approvals.)
 2. **Karangahape Road/Central Motorway Junction (K'Road/CMJ) Crossing** package through a Competitive Alliance to collaboratively manage utility, traffic, stakeholder and adjacent City Rail Link construction works risks on a critical path activity. Tender to be undertaken in parallel with the legislative hearings process to allow contract award by third quarter of 2020, following receipt of Conditions.
 3. **Manukau Harbour Crossing (MHX)** package, delivering a new crossing to NZ Transport Agency bridge manual standards via a Design and Construct Delivery Model. Tendering to commence three months after K'Road/CMJ to allow Industry and Transport Agency resourcing of Tender process.
 4. **Main works** package fully integrated, comprising the balance of civil works, including the stabling and maintenance depot, Systems and Power and Light Rail Vehicle supply with an operation and maintenance period.

Continued...

It is recommended that the NZ Transport Agency Board resolves to ... continued

- **Note** that the Procurement Strategy recommends a period of further market sounding and analysis to determine which of the Alliance; Design, Build, Operate & Maintain (DBOM); or the PPP (DBFOM), provides a superior delivery model for what will be the first line within a Light Rail network. There will be a report back to the Board with a final procurement model recommendation for the Main Works package by mid-2019 (including Market Sounding and Peer Review feedback)
- **Endorse** formal engagement with KiwiRail to establish a joint use agreement, including land purchase as required.
- **Endorse** advising the NZ SuperFund and Caisse de dépôt et placement du Québec (CDPQ) Joint Venture of the decision to not progress their Proposal as a USP, and encourage them to participate in any future market process for Auckland Light Rail

Detail on the Business Case and Procurement approach has been presented to the Board

- A NZ Transport Agency Board Workshop on Light Rail, presenting content of the Business Case and Procurement Strategy, was presented to the Board on 26 October 2018
- During the Board Workshop, further information was requested on a number of matters
- Papers have been produced addressing those requested matters and these are available in the Resource Centre in Diligent Board
- The information within this Board paper is therefore targeted at providing clarification on those matters

Conclusions from matters arising at the previous Workshop are summarised below

Topic	Issue raised	Conclusion
Safety	At-grade creates conflicts that can be addressed through elevated structure	At-grade schemes have a good safety record, elevated structure not preferred
Queen Street/ Dominion Road	Has route been reviewed by NZ Transport Agency?	Yes, both through Board papers and as part of this Business Case.
Choice of mode	Alternative options to conventional Light Rail – for example, rubber tyre	Conventional Light Rail provides best urban development outcomes
Number of stations and average speeds	Confirmation of details requested	Nineteen stops, with an average corridor speed of 30 kilometres per hour
KiwiRail	What is their position?	Confirmed alignment in principle; however, formal agreements need to be put in place

Continued...

Conclusions from matters arising at the previous Workshop are summarised below continued

Topic	Issue raised	Conclusion
Depot location	Confirmation that options have been assessed	Options have been assessed. Carr Road provides the best long terms benefits
Costs	Need clarity on costs – such as inclusion of escalation, inclusion of financing costs	Cost comparison table developed to provide clarity on cost position (in this Board paper)
NZ SuperFund (NZSF) / Caisse de dépôt et placement du Québec (CDPQ) proposal	Need clear recommendation on how to proceed	Proposal does not offer merit for the City Centre to Mangere (CC2M) project, therefore reject proposal
Value creation and value capture	Additional information required to understand potential contribution	Additional work required, to be reported to the Board in future meeting

An elevated structure on Dominion Road has been evaluated, and is not preferred

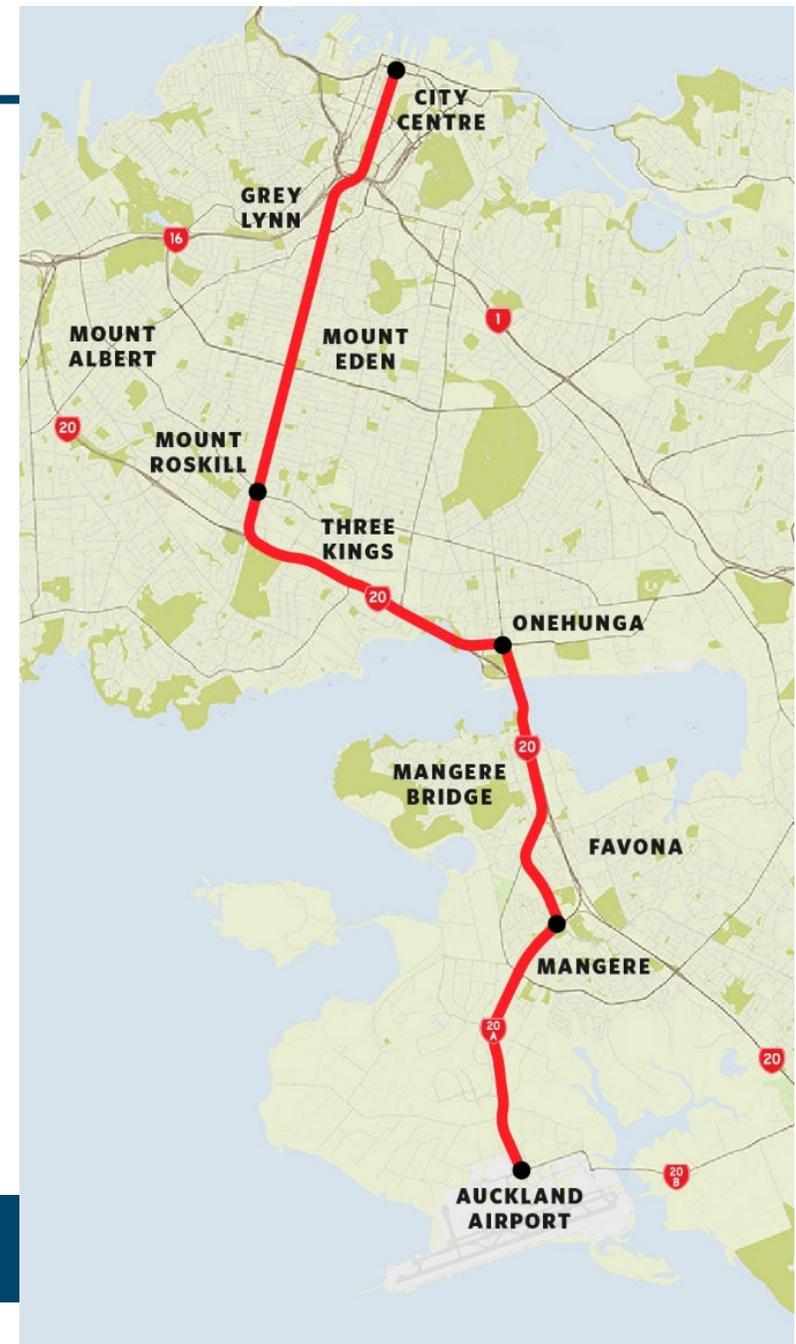
- An elevated structure on Dominion Road has been considered, as it offers potential to address perceived at-grade safety risks
- A review has been undertaken of at-grade Light Rail schemes internationally, and overall they have a good safety track record
- The elevated structure has significant additional costs (indicative \$50 million+/km)
- An assessment against the Auckland Unitary Plan identifies that this option contravenes the policies and objectives of the Plan, and would therefore be at high risk of not being consented
- Therefore, on balance it is recommended to retain the at-grade solution

This Board has previously agreed that light rail is the preferred mode and that it should follow Queen Street and Dominion Road

Board Paper	Subject	Relevance
2016/05/1016 (May 2016)	Auckland Central Access Plan – Programme Business Case	The Board agreed with the approach taken in the recommended programme, including the need for a mass transit solution along Dominion Road, but deferred making a final decision pending further work on the proposed rapid transit corridors as an input to the Auckland Transport Alignment Project
2016/06/1029 (June 2016)	Auckland – Rapid Transit to the Airport	The Board agreed that further investigations for a rapid transit network from the Airport along State Highway (SH) 20A (Onehunga to Airport) should be limited to light rail transit or bus rapid transit options (and not heavy rail)
2016/10/1066 (October 2016)	Auckland Transport Alignment Project (ATAP) – Recommended Strategic Approach and Next Steps	The Board supported implementation of a mass transit system from the airport to the city through the isthmus as a medium term priority (Decade 2: 2028-2038) <i>Note: This has since been brought forward to Decade 1 through recent changes to ATAP</i>
2017/03/1112 (March 2017)	Auckland Advanced Bus Study	The Board agreed in principle with the proposition of a staged, integrated transition from bus to light rail transit, including acknowledgment of Queen Street and Dominion Road as the preferred corridor

Recommended Alignment

- **Key Facts/Figures**
 - 23.3 km total distance
 - On street (urban) – 12.9 km (55%)
 - Off street – 10.4 km (45%)
- **Primary Interchanges**
 - Britomart
 - Mt Roskill
 - Onehunga
 - Mangere Town Centre
- **Total stops: 19**



Route Alignment summary

	Queen Street	Dominion Road	Mt Roskill to Onehunga	Onehunga to Mangere Town Centre	Mangere Town Centre to Airport
Length	1.8 km	5.9 km	4.7 km	5.4 km	5.5 km
Stops	3	6	3	4	3
Features	<ul style="list-style-type: none"> On-street running along Queen Street Queen Street pedestrianised between Customs and Wellesley Street Underpass under Karangahape Road (K'Road) 	<ul style="list-style-type: none"> On-street running along Dominion Rodd New bridge over Central Motorway Junction (CMJ) Dominion Junction ramps removed – intersection with New North Road signalised 	<ul style="list-style-type: none"> Dedicated corridor along SH20 in KiwiRail designation On-street running along Princes Street in Onehunga Multi modal interchange at Onehunga station Proposed Depot at Carr Road 	<ul style="list-style-type: none"> Dedicated corridor along SH20 through Mangere Bridge On-street running along McKenzie Road and Bader Drive Multi modal interchange at Mangere Town Centre 	<ul style="list-style-type: none"> On street running along Jordan Avenue and Westney Road Dedicated corridor from SH20A to Airport
Notes	<ul style="list-style-type: none"> A decision on the timing and location of a connection to Wynyard Quarter is deferred until further work has been done on the North Shore and Northwestern Rapid Transit Network (RTN) corridors On-street running assumes a dedicated right-of-way for the light rail, with signal priority at intersections, and a maximum speed limit, which is the same as the corridor the light rail is operating in 				

Key system assumptions have informed the Business Case



Vehicle specifications

- Length: 33m each
- Occupancy: 210 passengers
- Low floor
- Can be coupled to add capacity (extends to 67m)

Operations

- Max speed is 80 kph
- Peak headway of 4 minutes and off-peak headway of 8 minutes
- Signal priority at intersections
- Line of sight operation

Indicative stop locations have been confirmed

- A total of 19 stop locations have been identified as indicative stop locations for the project. This has been allocated across the following hierarchy of stops:
 - Major Stops (9 stops) – Provide transport interchange at key destinations along the route
 - Local Stops (10 stops) – Provide accessibility to existing and planned land use along the route
- Final stop locations for the Project will be confirmed as part of the next design phase. The assessment criteria is likely to include the following aspects:
 - Opportunities for Transit Oriented Development
 - Ability to unlock future development potential
 - Construction and utility constraints
 - Effect on the surrounding urban amenity
 - How the station fits into the overall hierarchy of stations
 - Expected patronage
 - Effects on overall route travel time
 - Effective active modes catchment

The preferred route and depot utilise the KiwiRail corridor alongside SH20

- From Mt Roskill to Onehunga, the preferred route utilises the KiwiRail Corridor north of SH20
- The proposed depot location at Carr Road is adjacent to this corridor
- Informal discussions to date with KiwiRail indicate a shared use is a practical option
- It is recommended that following Board endorsement of the route, formal engagement with KiwiRail commence to establish a joint use agreement, including land purchase as needed

The project is estimated to cost \$3.3b with ongoing operating costs of \$32m per year (\$2018 unescalated)

	Queen to Mt Roskill		Mt Roskill to Mangere		Mangere to Airport	
	P50	P95	P50	P95	P50	P95
Property	145	155	185	265	20	30
Construction	870	905	1,240	1,745	450	650
Subtotal	1,015	1,060	1,425	2,010	470	680

Capital Costs		P50	P95	Operating & Maintenance		\$M pa
	Property		350		450	Operating Costs
Construction		2,550	3,300	Maintenance Costs	36	
Subtotal		2,900	3,750	Total Operating Costs	73	
Rolling Stock (x33)		290	370	Farebox Revenue	41	
Total		3,200*	4,120*	Net Operating Costs	32	

* Does not include an additional future capital outlay for additional rolling stock which brings total cost to \$3.3 billion

The project has a BCR(G) of 1.1

Traditional Economic Benefits	NPV (\$m)
PT user benefits	971
Travel time savings – car	-82
Congestion reduction	46
PT Reliability	726
Vehicle Operating Cost savings	87
Emission reductions	4
Health benefits	140
Crash cost reductions	62
Agglomeration	943
SubTotal	2,898
Wider Economic Benefits	NPV (\$M)
Imperfect Competition	13-15
Urban amenity benefits	229
Other Economic Impacts	NPV (\$M)
M2MPJ (move to more productive jobs)	234
Infrastructure cost deferral*	23

Costs (P50)	NPV (\$M)	
Capital	2,631	
O & M	885	
Total (for BCR(N))	3,516	
Minus Fare Revenue & infrastructure cost deferral	-674	
TOTAL (for BCR(G))	3,179	
Benefit-cost ratio	BCR(N)	BCR(G)
Traditional Benefits	0.8	0.9
Wider Economic Benefits	0.9	1.0
Other Economic Impacts	1.0	1.1

*NB This is included within the appraisal as a cost saving



The packaging and procurement strategy is designed around market requirements, value for money, timeliness, and risk management

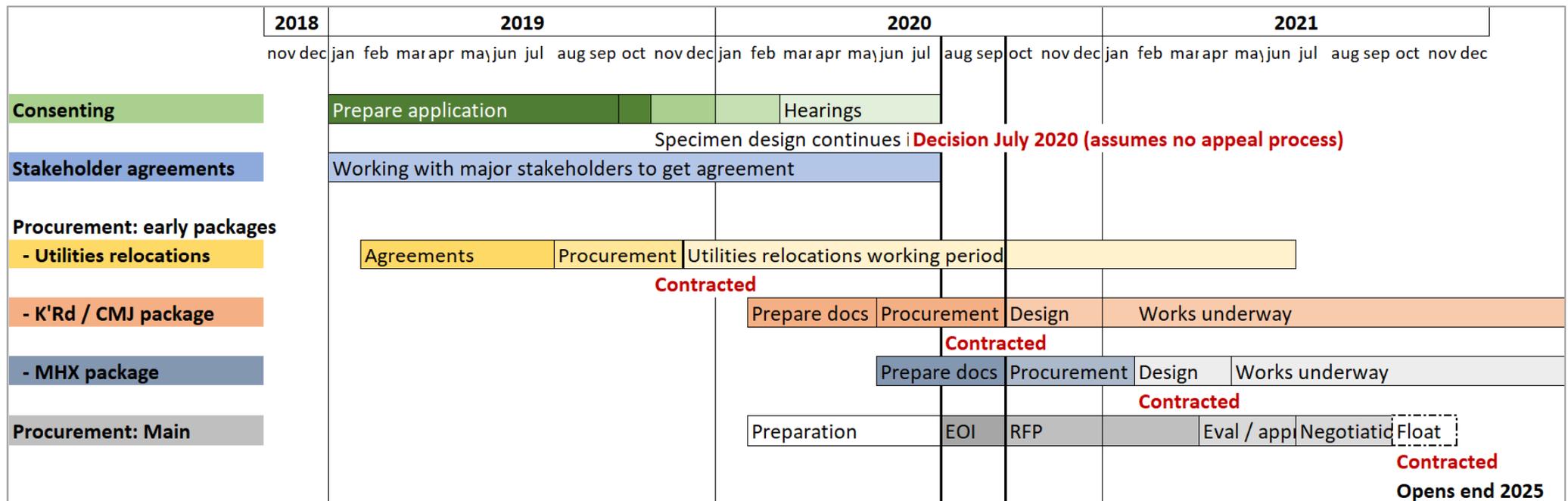
- There are three major cost and programme risks in a light rail project:
 - Major utilities relocations – The market will not take this risk
 - Interfaces – These are complex and it is best to minimise them
 - Stakeholder expectations – Must have Memoranda of Understanding (MOUs) in place clearly setting out agreed scope and responsibilities, prior to signing major delivery contracts
- Packaging affects these risks and the efficiency of delivery and quality of customer outcomes

The recommended procurement strategy is for four major packages of work procured through a variety of models

- Three early works packages:
 1. **Major utilities relocations** packages: Alliance / ECI
 2. **K'Road/CMJ crossings** package: Competitive Alliance
 3. **MHX crossing** package: Design & Construct (D&C)and one integrated main works package
 4. **Main package** fully integrated during the delivery and with the operations phase
- This packaging strategy achieves significant early activity on the critical path and removes both major utilities risk and interface risk from the main package
- The main package requires a procurement model that incorporates at least Design, Build, Operate & Maintain (DBOM), and could also include finance (DBFOM / PPP)
- **Further work and market testing is needed** to determine which of Alliance DBOM and PPP provides the best value proposition

Indicative procurement timeframes allow time to contract early works, agree stakeholder agreements, and procure main package

- All timeframes except utilities are driven by the consenting process
 - Consenting pathway is to a July 2020 decision
- Stakeholder agreements can begin immediately
- By September 2020, two major packages are contracted (Utilities and K’Road/CMJ) and utilities work is well underway.



Next steps in the procurement strategy development involve work to test the main works models and market sounding

- Market Engagement Summary Report will be issued to industry in November 2018
- For the main package model options, further detailed work will be done to:
 - assess the retained and transferred risk positions for the Transport Agency under each option
 - Quantitatively assess the Transport Agency's risk position and associated value proposition under the Alliance DBOM and PPP models by calculating a Public Sector Comparator (PSC)
 - Refine the models, in particular to improve their weak points and tailor to specifics of CC2M
- The Transport Agency will do Market Sounding in December 2018 and February 2019 focused specifically on the preferred packaging and procurement models
- Ministers of Transport and Finance will be briefed on the procurement options. This has been discussed with Ministry of Transport and Treasury

The costs in the economic and financial cases are derived from the same source, but they are built up of different cost components

- Economic costs are real and discounted, whereas financial costs are nominal (including escalation) and undiscounted
- The table below shows the stepping stones to get from the **Undiscounted and Unescalated Cost Estimate** to each of the **Economic** and **Financial Cost** estimates

All amounts are totals and \$millions

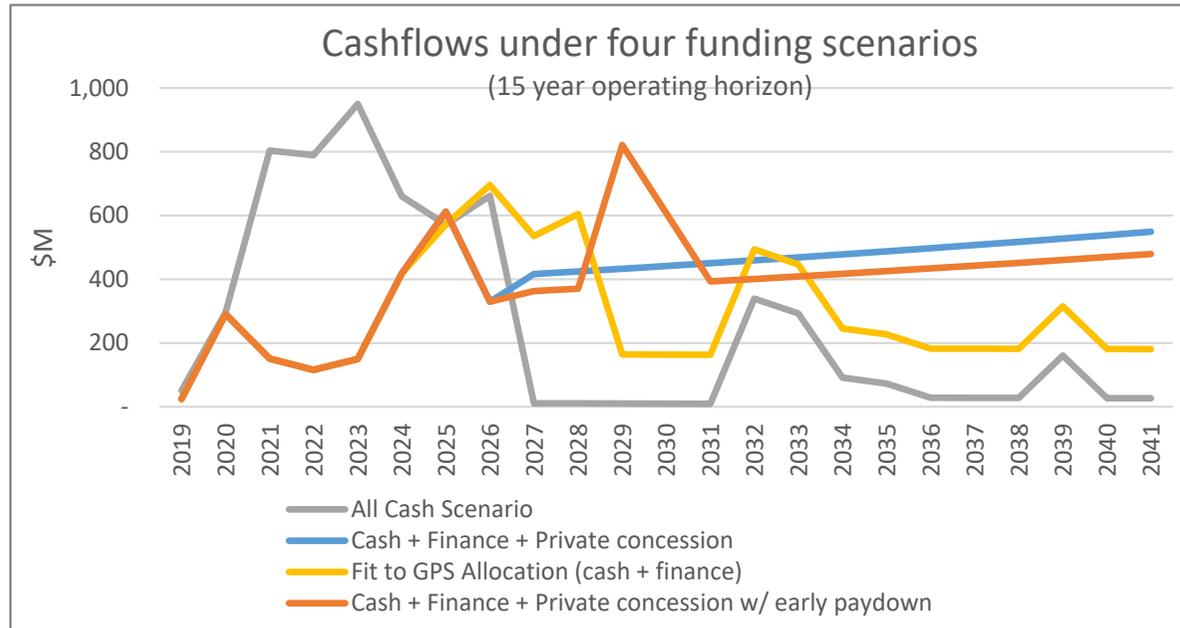
	P95 (30 year operating period)				
	Discounted, real	Effect of discounting	Undiscounted, real	Effect of escalation	Undiscounted, nominal
Build up of Economic Case net costs:					
Capital costs - total	3,340	890	4,230		
Operating and lifecycle costs	880	2,160	3,040		
Fare revenue & Bus operating costs	(300)	(1,080)	(1,380)		
Economic case net costs	3,920	1,970	5,890		
Remove bus operating costs (as are only in economic case)			(1,170)		
Adjust for revenue differences (due to different methodologies)			580		
★ Undiscounted and unescalated cost estimate			5300		
Build up of Financial Case net costs:					
Construction costs			4,230		
Operating and lifecycle costs			3,040		
Revenue			(1,970)		
Other financial costs not in economic case (client's own costs)			360		
Financial Case net costs (undiscounted and unescalated)			5,660		
Escalation of all costs to 2057				2,220	
Financial Case net costs (escalated), 30 year operating period					7,880

Diagram annotations: Purple circles around Economic case net costs (3,920, 1,970, 5,890) and Undiscounted and unescalated cost estimate (5300). Blue circles around Financial Case net costs (5,660), Escalation (2,220), and Escalated costs (7,880). Arrows labeled 1, 2, 3, A, B, C show the flow of adjustments between these values.

Finance of some form is required to fund CC2M

- The base assumption is that the National Land Transport Fund (NLTF) is used to fund CC2M
- The Government Policy Statement on Land Transport (GPS) includes approximately \$3.8 billion allocation to Rapid Transit over ten years
- The profile of this GPS allocation does not match the cost and spend profile of CC2M. Cashflows will need to be managed with some financing facility
- The nominal cost of CC2M is greater than the GPS allocation. Borrowing will be required for the difference unless additional funds become available
- With financing for CC2M, the key financial ratio (debt service costs / NLTF revenue) remains within the 8 to 12 per cent operating range

Different funding and financing scenarios have different total nominal cash outlays over a 15 year operating period, but similar present values



	Total nominal cash outlay (\$M)	Present value (\$M)
All Cash Scenario	5,900	3,700
Fit to GPS Allocation (cash + finance)	6,600	3,100
Cash + Finance + Private concession	9,200	3,700
Cash + Finance + Private concession w/ early paydown	9,000	3,700

The NZSF/CDPQ JV proposition has significant drawbacks for the CC2M project and should not be pursued further for this project

- The CC2M project is too far advanced to be suited to an unsolicited proposal
- s 9(2)(g)(i)
- Key elements of the proposed 'model' are not clear. Crucially, the value for money proposition (including cost) has not been stated
- International experience is that an unsolicited proposal of this scale and complexity is likely to take years to negotiate. It would delay CC2M delivery
- The continued presence of the proposal is creating ongoing uncertainty and distraction in the market
- s 9(2)(g)(i)
- s 9(2)(g)(i)
- NZSF presents a potential funding partner for other future projects

Value creation and beneficiary benefit analysis is underway for CC2M and CC2NW light rail

- An international consultant with light rail experience (Luti Consulting) is working on a targeted study to quantify value uplift and benefit realisation for five areas on CC2M and City Centre to NorthWest (CC2NW) light rail corridors
- The Transport Agency intends bringing preliminary findings to the Board in December 2018
- Dominion Road is one of the areas to be analysed, including location alternatives for intermediate stops that could underpin commercial negotiations with landowners
- The CC2NW analysis will take a 'string of pearls' approach to look for areas with high value creation potential that could be used to help decide the CC2NW light rail corridor
- This is strategic lead-in analysis needed now before a CC2NW corridor is indicated. This information will assist the development of a value capture strategy for CC2NW, including potential for land purchase before the property market moves in response to a corridor location signal
- Results will be available end of first quarter 2019

Public communication on the route is planned for November/December 2018

- Engagement is proposed with local communities along the proposed Auckland Light Rail corridor from mid-November 2018
- This will help the Transport Agency to own the story, tell the big picture story, build confidence and demonstrate progress
- There is a proposed joint announcement by the Minister of Transport and Mayor of Auckland in the week following the 9 November 2018 Board meeting
- Dates are still to be confirmed
- A four-week engagement period will utilise a wide range of communications tools and channels and will be supported by a comprehensive marketing campaign and media plan

Objectives for this communication phase...

- Win hearts and minds, and ensure ownership of the story and messaging
- Inform wider Auckland community and neighbourhoods about the preferred route
- Ensure purposeful engagement that enables advocacy
- Demonstrate the Transport Agency has made progress since taking the lead on the Light Rail programme
- Ensure the Transport Agency has met its obligations to engage with communities to provide input into next phase of project development – that is, the design phase