

29 September 2021

Budget Estimates Report

City Centre to Mangere Light Rail Project

Auckland Light Rail
ALR Group

making the **difference**



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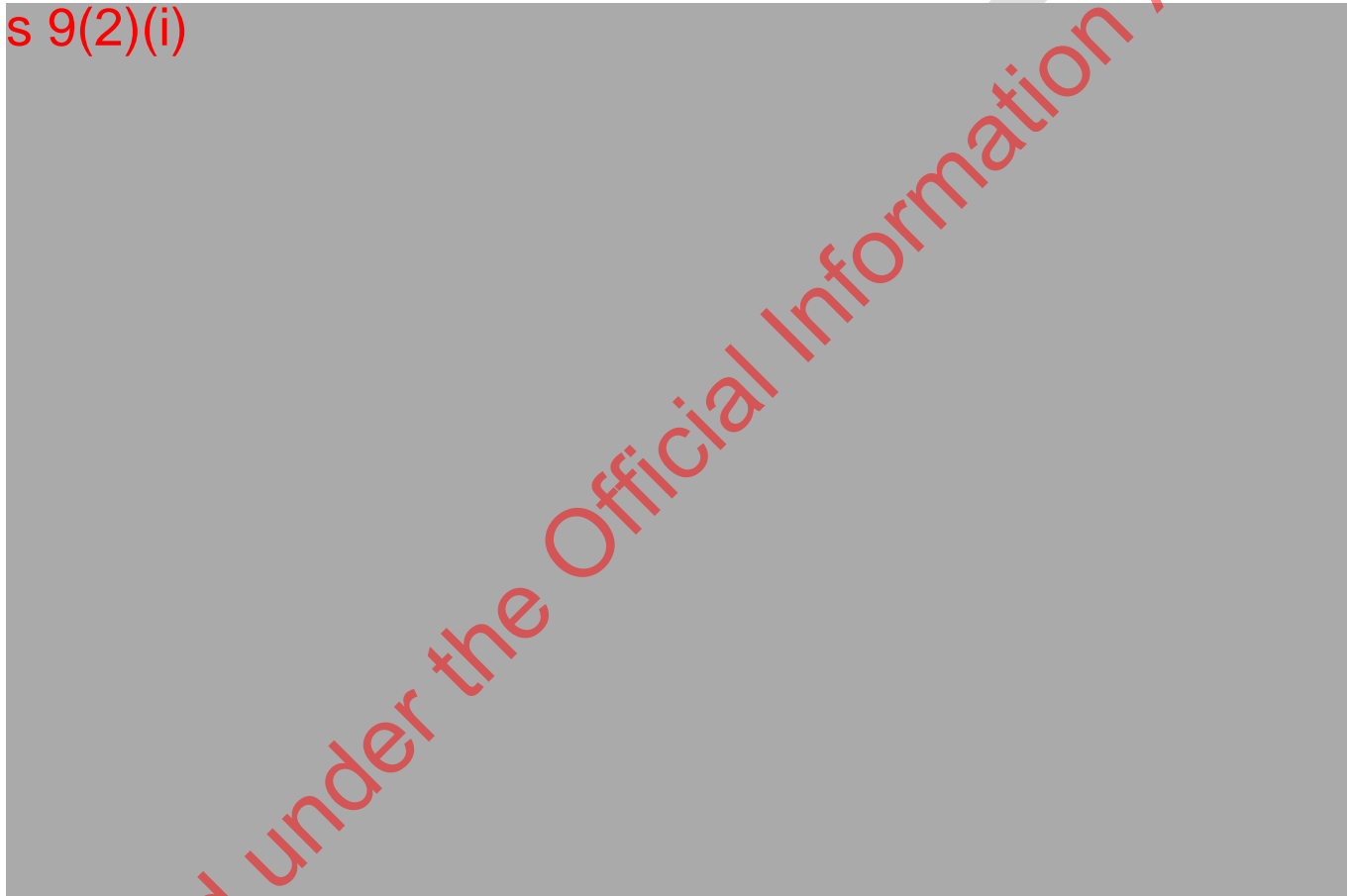
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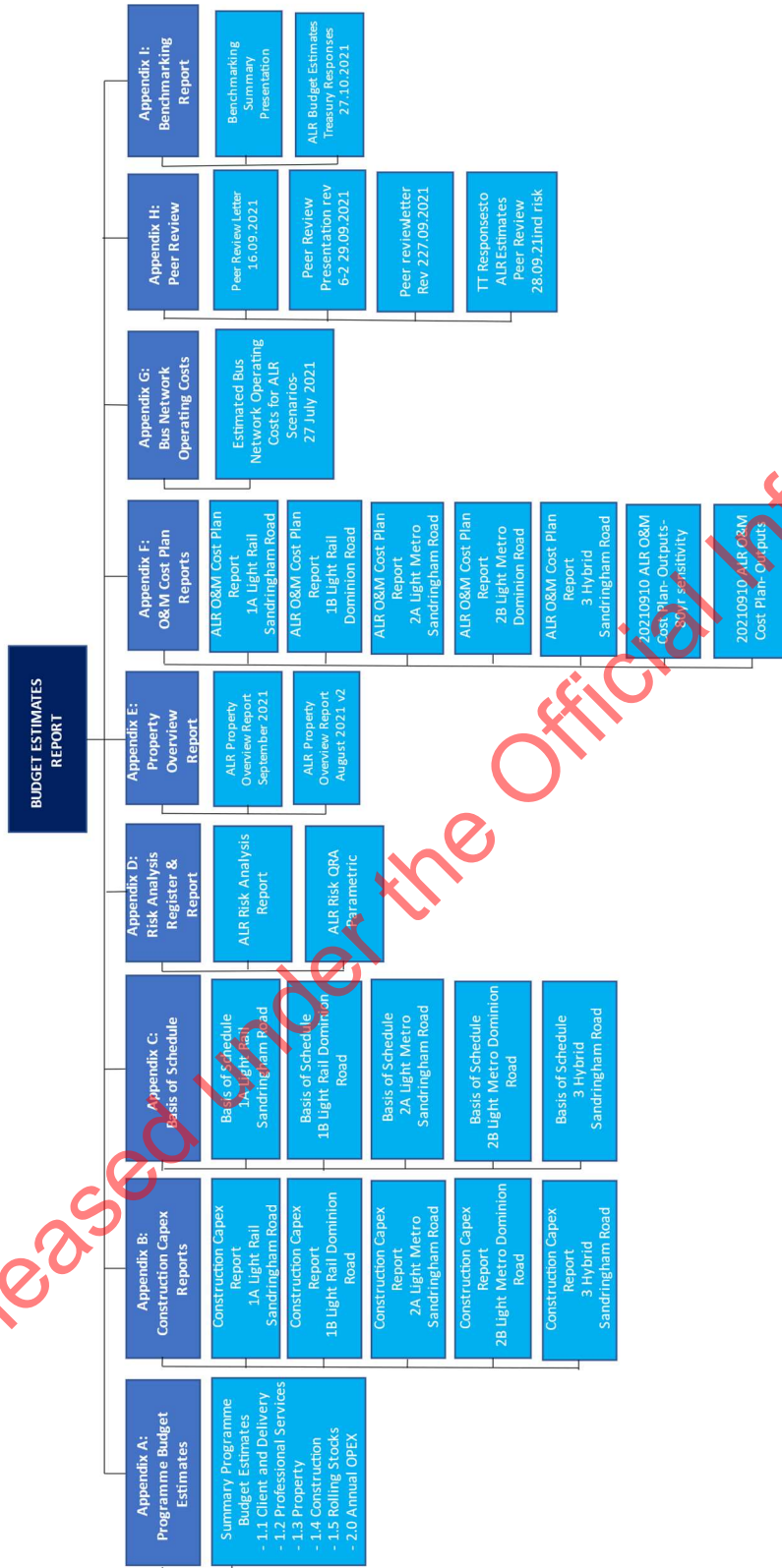
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1 Document Map



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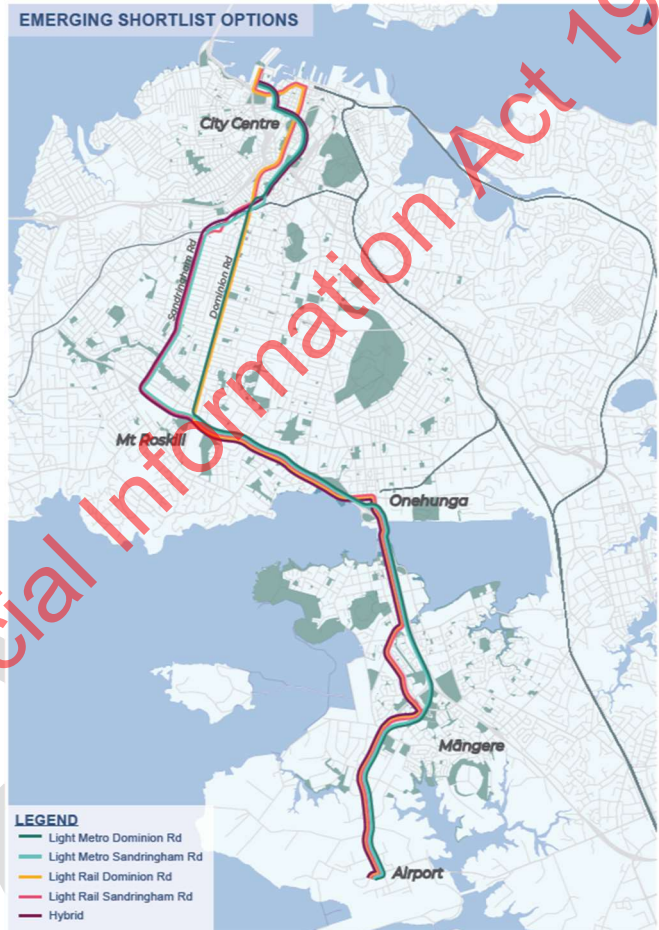
2 Executive summary

2.1 Introduction

Turner & Townsend has been commissioned by New Zealand Transport Authority (NZTA) to undertake a class 5 cost estimate of the capital and operational expenditure for each of the five proposed options for Auckland Light Rail 2021 Indicative Business Case:

- Option 1A: Light Rail via Sandringham Road
- Option 1B: Light Rail via Dominion Road
- Option 2A: Light Metro via Sandringham Road
- Option 2B: Light Metro via Dominion Road
- Option 3: Hybrid via Sandringham Road

Supporting information and specifications have been provided by the Auckland Light Rail (ALR) team, predominantly composed of NZTA representatives and various consultants including Arup, Aurecon, Jasmax, and The Property Group. Turner & Townsend has also drawn from experience of similar projects from Australia, New Zealand and globally to provide cost indication.



The schemes taken forward beyond the silver design information can be summarised as:

	Option 1B: LR Dominion	Option 2A: LM Sandringham	Option 3: Hybrid Sand'ham
Total Length	24.1km	24.0km	24.5km
On Street	14.1km	-	4.5km
Segregated	10.0km	24.0km	20.0km
Underground	1.5km	14.0km	9.5km
Stops/Stations	22	17	18
Stops	16	-	10
Stations	6	17	8
Underground	1 (K' Road)	12	8

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2.2 Budget Estimates

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2.3 Summary of Budget Estimates

This report has been prepared to provide commentary to Turner & Townsend Budget Estimates.

The Budget Estimates has been broken into 6 key cost elements:

- Client and Delivery Entity
- Professional Services
- Property Acquisition
- Construction
- Rolling Stock
- Operational Expenditure (OPEX)

Following recommendation from NZTA, Turner & Townsend has made an analysis of what forms the core costs of the project and which activities can be considered as peripheral costs in the way they can be carried out as a separate scheme at an earlier or later date. The structure of the Budget Estimates has therefore been broken down with the components summarised below:

- A. Core CAPEX composed of:
 - Core Professional Services Costs
 - Core Property Costs
 - Core Construction Costs
 - Rolling Stocks Costs
- B. Peripheral CAPEX composed of:
 - Client and Delivery Entity Costs
 - Peripheral Professional Services Costs
 - Peripheral Property Costs
 - Peripheral Construction Costs
- C. Risk
- D. Escalation
- E. OPEX

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The Budget Estimates for options 1B, 2A and 3 are based on the Ruby set of drawings along with the technical notes as developed by the ALR team.

Following decision from NZTA on 20th August 2021 to put on hold options 1A and 2B, the ALR design team did not pursue the development of these options' design to the **Ruby** stage. Therefore, the Budget Estimates for options 1A and 2B are based on the Silver set of drawings along with the technical notes as developed by the ALR team.

The difference in design development between the various options creates a difference in the level of details of the Budget Estimates.

2.4 Classification of estimate

In consideration of the design information available (IBC concept design) and the relatively short time scale to develop 5 standalone Budget Estimates, Turner & Townsend has taken a high-level approach in developing the Budget Estimates that can be associated with a Class 5 estimate as defined by the Cost estimate Classification system summarised in the below table:

ESTIMATE CLASS	PTA Design stages on CRL	Primary Characteristic		Secondary Characteristic	
		MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges at an 80% confidence interval
Class 5	Pre Stage A - Definition Design	0% to 2%	Concept screening	Cost / length factors, parametric models, Judgement or analogy	L: -20% to -50% H: +30% to +100%
Class 4	Stage A	1% to 15%	Study or feasibility	Cost/length , factored or parametric models	L: -15% to -30% H: + 20% to +50%
Class 3	Stage B	10 % to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10%to +30%
Class 2	Stage C	30% to 75%	Control or Bid/Tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5%to +20%
Class 1	IFC	65% to 100%	Check Estimate Bid/Tender	Detailed unit cost with detailed take-off	L: - 3% to -10% H: +3%to +15%

It is acknowledged that the design information remains insufficient to be used to develop a class 4 estimate. Turner & Townsend has assessed the level of accuracy of the Budget Estimates is between Minus 30% to Plus 50% and Minus 40% to Plus 70%.

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2.5 Cost estimate methodology

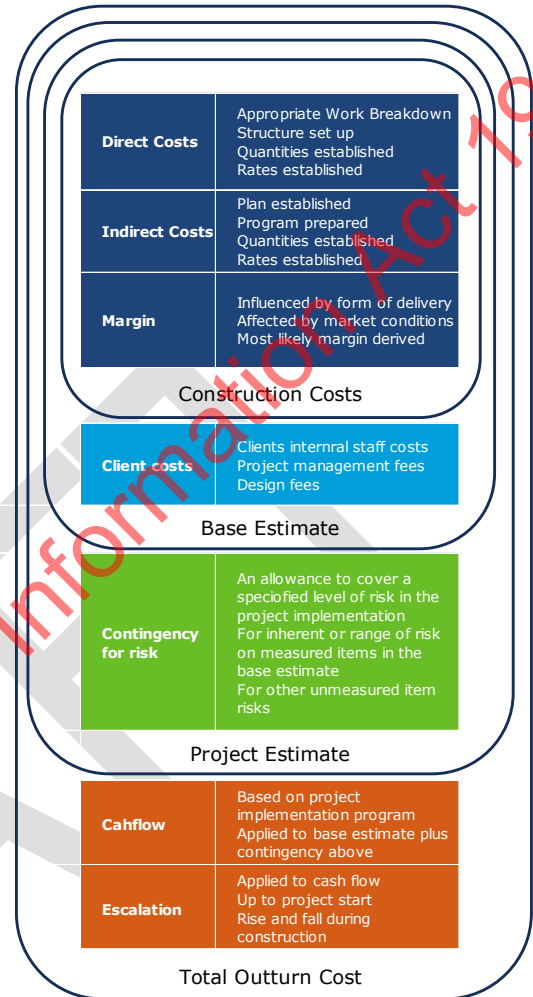
We have adopted an industry standard for structuring the estimate in line with the adjacent diagram.

In developing the cost estimate, it has been necessary to adopt a number of different cost estimating techniques according to the nature of the activity being estimated and the level of design information available. The techniques used range from composite unit rates using local market rates, to allowances for packages of work based on recently tendered contracts and actual costs obtained from completed comparable projects or current market data and adjusted to suit local market conditions.

2.6 Cost estimate software

Our Exactal CostX software suite has been used to assist in the preparation of the cost estimate and is a measurement and estimating software package that interfaces directly with electronic drawings.

A CostX Viewer file can be provided for this estimate which allows the user to review the quantities measured as the basis of the estimate.



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