

Appraisal Summary Table Template

Date:	14/01/2023	Evaluation Period: (Baseline and forecast year) e.g 2020 - 2060	Baseline is 2018 (unavailable) or 2022 (not used). Forecast is 2023. Economic assessment is prior period (2018-2022).	Option Name:	Recommended Programme	This is the preferred option <input checked="" type="checkbox"/>	
Problem/opportunity statement:	<p>1. Constraints in the rail system mean that a current accommodable growth in travel demand for freight and passenger, leading to inefficient operations.</p> <p>2. Current customer levels of service are far below what is economically justified to deliver the benefits of a modern rail network. Meeting economic targets can be met.</p> <p>3. A modernised rail network and assets is needed to increase network productivity, reduce service costs and improve service quality for all users.</p>	Investment objectives:	<p>1. Continually increase the use of rail in Auckland (all markets) over the next 30 years, by increasing its attractiveness.</p> <p>2. Performance factors include reliability, frequency, capacity, and on-time arrival.</p> <p>3. Increase Auckland's net freight emissions by increasing rail's mode share over the next 30 years.</p> <p>4. The Auckland rail network supports and enables a diverse urban form within the urban area consistent with the next 30 years.</p> <p>5. The Auckland rail network is resilient and suitable for the future.</p>	How project gives effect to OPIs:	<p>Enabling, mode shift to be more efficient and lower emissions supports the OPI's overarching objectives including climate change. The availability of rail services to business and industry, and the rail freight services are much more cost-efficient than the truck alternative.</p> <p>Investment in the Auckland rail network will be positioned to deliver on the OPI's overarching objectives.</p> <p>Suitable user development: Investment in capacity and asset renewal will support more diverse development along rail corridors.</p> <p>Reliability: In rail operations safety, passenger safety and security, reducing maintenance time, and reliability to support mode shift from private car to rail.</p> <p>Integrated freight system: Investment is intended to deliver an integrated, low-emission freight alternative to road. Intermodal freight services have been shown to be more efficient when network capacity is constrained, and the investment seeks to address this.</p> <p>Maintaining and upgrading the system: Investment in maintenance and assets, including a new program identified by the PFI, will ensure the program will address the challenge of the Auckland rail network does not allow for resilience for freight or passenger services. There is limited redundancy in the network and any new elements partly to the extent of operational costs or maintenance requirements. This is a core issue to be addressed by the programme.</p>	How project gives effect to local community outcomes:	Not assessed at this stage. Local Board engagement will occur on the preferred/recommended programme to identify areas of alignment and concern.

1. Summary of Non-Monetised Impacts (Description)	2. Summary of Financial Impacts (nominal, non-discounted) (Total funding requirement (incl. committed funding))	3. Summary of Monetised Option Impacts (present value, 2022\$, discounted)
<p>Deliver 87% frequency improvements, 81% of days with trains running for 7 days (incl. weekday) to provide this is mostly a 52% reduction to approximately freight costs, as more freight can be delivered in the Southern Line. This means the time and cost of operation of an 87% frequency service will be significantly reduced to accommodate growth. Major stations where freight services could have high level of service, including viability of rail (and PFI) as a viable mode, when operating with an service at this interchange location (eg Dunedin, Palmerston North). This increases network productivity.</p> <p>Inclusion of 4.0 extra service days, new infrastructure can be used for freight services.</p> <p>High level of maintenance and renewal ensure higher levels of durability and reliability across the network, plus improvements to signalling systems. High levels of reliability can be achieved, with considerable room to accommodate growth. By controlling through the junction, means will be put in place through the network. The recommended programme is consistent with Option 3B, in that the controlling measures are a part of controlling congestion, mitigating this issue to a large extent.</p> <p>Safety and emissions outcomes are better than the Do Min, noting there is only minor for extra passenger given fixed decarbonisation expectations established in the Do Min. These impacts are much more material for freight, highlighting the significance associated with freight rails to the overall business associated with the programme.</p> <p>Additional passenger transfer time savings across the network - compared to the Do Min and Option A - in conjunction with the new Auckland Southern Line (incl. upgrade of accessibility) will "add" greater access to employment and skills from passenger than the Do Min.</p> <p>Positive environmental effects will be generated due to the construction and operation of the Auckland Southern Line. The inclusion of a number of options, which are designed to allow temporary (construction) and permanent (operational) effects on the environment. For operational effects, increased noise would be experienced in surrounding properties due to the operation of trains along the alignment. As the alignment is likely to be used for freight operations, noise may operate at night.</p> <p>The visual character of existing residential areas will be changed (improved) through the provision of railway infrastructure. There would be some impacts on the Do Min as outlined at Wg. 10.4.4.2.6.</p>	<p>Capital Costs (including renewals)</p> <p>\$34,360m</p> <p>Operating Costs</p> <p>\$19,690m</p> <p>Total Financial Costs</p> <p>\$54,050m</p>	<p>Total Monetised Benefits, excluding Wider Economic Benefits (WEBs)</p> <p>\$17,815m</p> <p>Total Monetised Benefits, including Wider Economic Benefits (WEBs)</p> <p>\$20,525m</p> <p>Total Economic Benefits</p> <p>\$17,026m</p> <p>BCR (including WEBs)</p> <p>1.0</p> <p>BCR (excluding WEBs)</p> <p>1.2</p>

Transport Outcomes	Non-Monetised Impact: (Description in nominal or narrative terms)		Monetised Impact: (Description in dollar terms in real terms (2022\$), non-discounted)			
	Name of Measure:	Baseline:	Do Minimum Impact:	Option Impact:	Do Minimum Impact:	Option Impact:

Health and safety risks (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)						
3.1 Impact on road and incidents of crashes	3.1.1 Health and serious injuries	649 ODs on the Auckland road network based on motorway in the year ending March 2023 (latest available)	1599 ODs on the Auckland road network (road and motorway) in 2023, based on MCM forecasts of VOT and OD rate per kmVOT	186 ODs on the Auckland road network (road and motorway) in 2023, based on MCM forecasts of VOT and OD rate per kmVOT - a net minor reduction compared to the Do Min	n/a	\$1,769m (road and freight)
3.2 Impact of air emissions on health	3.2.1 Ambient air quality - NOx	Based on MCM (2018), road vehicle NOx emissions are 4,432 tonnes per annum	Based on MCM (2018), road vehicle NOx emissions are 4,482 tonnes per annum in the Do Min	Based on MCM (2018), road vehicle NOx emissions are 1,460 tonnes per annum	n/a	\$1,697m (road and freight)
3.2 Impact of air emissions on health	3.2.1 Ambient air quality - PM2.5	Based on MCM (2018), road vehicle PM2.5 emissions are 400 tonnes per annum	Based on MCM (2018), road vehicle PM2.5 emissions are 29.0 tonnes per annum in the Do Min	Based on MCM (2018), road vehicle PM2.5 emissions are 25.8 tonnes per annum	n/a	Included in the above as overall emissions impacts on health

Resilience and security (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)						
4.1 Impact on system vulnerabilities and redundancies	Peak network utilisation (i.e. 40% planning level of 75% for mixed rail)	Peak network utilizations is 91% constrained by 81-minute terminals which will be reduced by the completion of OPIs.	Utilisation by section: West: 87% East: 87% Inner South: 70% Outer South: 103% (Significantly over limit)	Utilisation by section: West: 75% East: 87% (Small time period, due to expansion of 81 from freight paths) Outer South: 75% Inner South: 58%	n/a	n/a - benefit manifests through reliable operations, which influences a range of benefit line items

Economic prosperity (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)						
5.2 Impact on network productivity and utilization	5.2.3 Freight - mode share weight	Rail freight is estimated to currently (based on 2017 (FY) values) to have a mode share of around 12% (based on mode tonne-km)	The Do Min in 2023 is estimated to have a mode share of 16% for rail (based on tonne-km for the addressable market)	Freight Services 81 (the base case for freight) is estimated to reach a mode share of 24% for rail (based on tonne-km for the addressable market)	n/a	Captured below
5.2 Impact on network productivity and utilization	5.2.5 Freight - throughput weight	Estimated 2023 rail freight (incl. out of Auckland): 5.2m tonnes 1.18b tonne-km	Estimated 2023 Do Min (incl. out of Auckland): 12.4m tonnes 2.4b tonne-km	Estimated 2023 (Freight Services 81) freight of Auckland: 17.9m tonnes 1.3b tonne-km	n/a	Total freight related benefits: \$21,822m
5.2 Impact on network productivity and utilization	5.2.6 Access to key economic distributions (all modes)	Based on MCM (2018) by PT, within: \$0m - 25,300 \$25m - 79,700 By car, within: \$0m - 213,200 \$25m - 453,600	Based on MCM (2018) in the Do Min, by PT, within: \$0m - 56,000 \$25m - 183,200 By car, within: \$0m - 380,876 \$25m - 676,662	Based on MCM (2018) by PT, within: \$0m - 65,341 \$25m - 204,942 By car, within: \$0m - 387,203 \$25m - 680,043	n/a	n/a - picked up in other benefit estimates
5.2 Impact on network productivity and utilization	Peak network utilisation (i.e. 40% planning level of 75% for mixed rail)	Peak network utilizations is 91% constrained by 81-minute terminals, which will be reduced by the completion of OPIs.	Utilisation by section: West: 87% East: 87% Inner South: 70% Outer South: 103% (Significantly over limit)	Utilisation by section: West: 75% East: 87% (Small time period, due to expansion of 81 from freight paths) Outer South: 75% Inner South: 58%	n/a	n/a - benefit manifests through reliable operations, which influences a range of benefit line items
5.1 Impact on system reliability	Productive maintenance available (log hours per day)	On average this is 2.28 hours per night (noting 8 varies across the network). The outer Southern Line is only around 2 hours, inner Southern and Western Lines are around 2.5 hours.	No material change from the Do Min, remaining at 2.3 hours per night, against a requirement for 6 hours on 3 hours per night.	3 hours productive maintenance per night (where applicable) is achieved.	n/a	n/a - benefit manifests through reliable operations, which influences a range of benefit line items

Environmental sustainability						
6.1 Impact on greenhouse gas emissions	6.1.1 CO2 emissions	Based on MCM (2018), road vehicle CO2 emissions are 2.7m tonnes per annum	Based on MCM (2018), road vehicle CO2 emissions are 1,407m tonnes per annum. This reduction from today is due to reduced emissions from 47% MCM assumed fuel efficiency over time, despite a 47% increase in VOT.	Based on MCM (2018), road vehicle CO2 emissions are 1,407m tonnes per annum - a minor reduction from the Do Min.	n/a	\$13m for road vehicle CO2 reduction benefits
6.1 Impact on greenhouse gas emissions	6.1.2 Mode shift from single occupancy private vehicle	Based on MCM (2018), road vehicle VOT is 10.8 km per annum.	Based on MCM (2018), road vehicle VOT is 10.8 km per annum in the Do Min.	Based on MCM (2018), road vehicle VOT is 13.79 km per annum.	n/a	\$95m for freight-related CO2 reduction benefits
6.1 Impact on greenhouse gas emissions	6.1.2 Mode shift from single occupancy private vehicle	Based on MCM (2018), annual PT passenger km travelled (PCT) is 0.95b km per annum.	Based on MCM (2018), annual PT passenger km travelled (PCT) is 0.95b km per annum in the Do Min.	Based on MCM (2018), annual PCT is 1.44b km per annum in the option.	n/a	Covered elsewhere

Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.						
Inclusive access						
10.1 Impact on accessibility	10.1.1 To All Auckland	n/a	All rail will benefit (along with the rest of Auckland) from the completion of OPIs, which improves access to the city centre from rail served areas (and vice versa).	No specific impacts on the AoM (All Auckland) from the completion of the programme level.	n/a	0\$
10.2 Impact on mode choice	10.2.1 People - mode share	Rail mode share based on MCM (2018) (incl. CHL) is 13% from the addressable market (acknowledging rail is not a viable option for large parts of Auckland). Auckland wide rail mode share is approx 1.5%.	Rail mode share based on MCM (2018) (incl. CHL) is 21% from the addressable market (acknowledging rail is not a viable option for large parts of Auckland). Auckland wide rail mode share is approx 3.2%.	Rail mode share based on MCM (2018) (incl. CHL) is 25% from the addressable market (acknowledging rail is not a viable option for large parts of Auckland). Auckland wide rail mode share is approx 4.4%.	n/a	Total rail mode benefits: \$6,860m Total PT user benefits: \$28,370m
10.2 Impact on mode choice	10.2.3 Freight - mode share weight	Estimated 2023 rail freight (incl. out of Auckland): 5.2m tonnes 1.18b tonne-km	Estimated 2023 Do Min (incl. out of Auckland): 12.4m tonnes 2.4b tonne-km	Estimated 2023 (Freight Services 81) freight of Auckland: 17.9m tonnes 1.3b tonne-km	n/a	Freight related benefits: \$21,822m (Over/ Oupside of above)
10.3 Impact on user experience of the transport system	10.3.1 People - throughput of pedestrians, cyclists, and public transport beneficiaries	Heavy rail boardings, based on MCM (2018) (incl. CHL), are estimated from annual weekday to annual: -20 km Total PT boardings: 100.3m	Heavy rail boardings, based on MCM (2018) (incl. CHL), are estimated from annual weekday to annual: -55 km Total PT boardings (incl. LRT): 248m	Heavy rail boardings, based on MCM (2018) (incl. CHL), are estimated from annual weekday to annual: -76.2m Total PT boardings (incl. LRT): 267.2m	n/a	Total PT user benefits: \$28,370m

Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.

Rationale for option selection decision

This is an update of the recommended option from the short list, once it has been refined into the preferred programme and refined analysis completed. Note that in addition to refining the analysis to expand the scope of benefits, the updated values from the MCM (April 2023) have been incorporated, which were not used for the short list assessment.