Rail Key Performance Indicators

Appendix J

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TE TUPU NGĀTAHI
Supporting Growth

Do-minimum scenario comparison to preferred options

A do-minimum scenario is used to provide a comparator against the preferred option outcomes. This scenario includes the anticipated 2048+ growth and assumes the existing network or planned committed projects outside of SGA are to be implemented by 2048.

Additionally, there are different assumed scenarios for each project, which are used to highlight the different benefits of each project

Rail Corridor Upgrade

Do-Minimum Scenario: *the do-minimum scenario assumes that there are only two-tracks, but new stations are provided*

New Rail Stations

Do-Minimum Scenario: *the do-minimum scenario assumes that there are only two-tracks, with no new stations provided*

Active Mode Corridor

Do-Minimum Scenario: ***f****or the active mode corridor, the outcomes are examined by directly comparing to the results of not having the corridor in place*

	Problems	Investment Objectives	Benefits	KPI	Measure	Results	
Rail Corridor Upgrades	**PS1:** Failure to future proof the southern rail network between Papakura and Pukekohe in line with the planned urbanisation of Southern Growth areas, increase in rail freight and inter-regional services will result in poor access to employment and key centres.	**IO1:** A transformational increase in the capacity, resilience and attractiveness of the southern rail network between the Southern Growth Areas and key centres such as Manukau and Papakura to support regional and inter-regional trips	Improved access to markets, business areas, and supporting tourism	Access to key economic destinations	Catchment within 800m walk and 3km cycle of town centre area (% / No.)	• 3,000 dwellings (2% in the South region) within 800m walk of Drury town centre • 43,000 dwellings (or 33% in the South region) within 3km cycle of Drury local town centre • 5,000 dwellings (3% in the South region) within 800m walk of Paerata town centre • 20,000 dwellings (or 15% in the South region) within 3km cycle of Paerata town centre	
					Jobs within 30 by Car and 45 mins / 60 mins by PT in AM peak (% / No.)	• 90,000 jobs are accessible from Drury within 30mins via car, a 2% increase from do-min, and 67,000 jobs accessible from Pukekohe-Paerata (similar to the Do-min) • Within 45mins by PT 107,400 jobs from Drury (or 3% increase compared to Do-min) and 104,000 jobs from Pukekohe-Paerata (31% increase) • Within 60mins via PT, 324,000 jobs are accessible from Drury, a 26% increase from do-min, and 260,000 jobs from Pukekohe-Paerata (24% increase)	
				Performance of Strategic PT network	Average speed for PT in AM peak in the BC area	**Preferred Option:** • 49kph average bus speed - All South • 51kph average bus speed - Drury • 61kph average bus speed - Pukekohe/Paerata	**Do Minimum:** • 45kph average bus speed - All South • 45kph average bus speed - Drury • 55kph average bus speed - Pukekohe/Paerata
					% of passenger kms travelled in severe congestion (>90 v/c) in AM peak	• 0.5% in the Preferred Option for all of the South moving sub-regionally • Compared to 0.6% with under do-min scenario	
				Performance of Strategic Freight network	% of freight travel in severe congestion (>90 v/c) on freight network - IP Peak	• 28% in the Preferred Option for all of the South moving sub-regionally • Compared to 29% with 2 tracks and no stations	
				Performance of Strategic network	Lane capacity of key corridors (cordon) in BC area in AM peak	Upgrades to the rail corridor reduces reliance on single occupant vehicles using strategic corridors such as SH22, Great South Road, Pukekohe Expressway and Mill Road , enabling more capacity for strategic and freight trips.	
					% of vehicle kms travelled in peak congestion (>90 v/c) in AM peak	Preferred Option: 35.9% (All South), 12.9% (Drury), 5% (Paerata and Pukekohe) Do Minimum: 36.8% (All South), 13.2% (Drury), 5% (Paerata and Pukekohe)	
	PS2: Travel demand growth due to rapid urbanisation and higher rail frequencies will increase the exposure to unsafe level crossings, resulting in increased risk of DSIs in the future.	**IO2:** Significantly improve safety at rail crossings	Improved safety for all transport modes	Reduction in DSIs by reducing VKT in the network	All modes DSIs	In 2048+, the Preferred Option will reduce vehicle-km travelled per year compared to Do-min by providing more capacity on the network using rail instead of vehicle use. This reduction and the proposed road design aligned with Vision Zero (AT) and Road to Zero (Waka Kotahi) will likely reduce DSIs on these corridors significantly in 2048+. The reduction is show through a prediction of 11.3m VKT annual reduction when comparing the Preferred Option to the Do Minimum.	
					Active modes DSIs	Active mode DSIs are expected to be reduced by providing safer facilities to walking and cycling on these corridors.	
				Rail crossing DSI	Motor Vehicle DSIs	23 near-collision incidents - vehicle related in the last 10 years. Reduce DSI to zero by closed level crossings	
					Active modes DSIs	1 near-collision incident - pedestrian related in the last 10 years. Reduce DSI to zero by closed level crossings	
	PS3: Over reliance on SH1 and a constrained rail corridor for the Southern Growth areas results in resilience challenges and constrains productivity, which will be exacerbated by growth.	**IO3:** Improved accessibility to jobs, households and social amenities, which will be enabled through mode and route choice, resulting in a transformational mode shift to rail network	Improved transport choice	Quality of rail network	% / No. of PT users boarding express services	• 70% of rail patronage using express services OR 50% of total PT trips going north • Crowding factor of 1.00-1.09 at the new stations in the Preferred Option compared to 1.12-1.6 crowding factor in the Do Minimum. Crowding factors more than 1 indicate services are running at seated capacity. Therefore, upgrades to the rail corridor allow for less crowding on trains, resulting in more upstream capacity.	
					Rail frequency in AM peak	• 10mins - All Stops Service >> 12 trains in AM peak (northbound) • 10mins - Express Service >> 12 trains in AM peak (northbound) • 24 trains total in AM peak from Pukekohe (northbound) • Four-Tracking allows for these 12 Express services to run in peak times by 2048, in conjunction with the all-stop services	
			Improved network resilience for the most critical connections	Availability of alternatives to strategic connection	Every strategic network connection has an appropriate alternative to key destinations	Rail provides an alternative for vehicle use for strategic and local trips, enabling a mode shift and providing resilience for the road network such as SH 1, SH 22, Pukekohe Expressway and Mill Road. In addition, providing for 4-tracks gives an additional resilience effect to the rail network, minimising disruption due to track failure on a line etc.	

Problems	Investment Objectives	Benefits	KPI	Measure	Results
New Rail Stations **PS1:** Rapid residential growth in Drury, Pukekohe and Paerata, coupled with very limited access to the Southern rail corridor will restrict travel choice, access to local amenities and poor land use integration.	**IO1:** To support growth, improve mode choice and a more sustainable, quality urban form in Drury and Paerata by enabling access to the rail network	Reduce reliance on low occupancy vehicles	Mode share (local and inter-regional trips)	% Active mode share for local trips in AM peak	16% Active Mode - All South
				% PT mode share for inter-regional trips to north in AM peak	31% PT – North bound trips (screen line at Takanini). 22% of this is by rail.
			New PT users	Number of new PT boardings using rail service in BC area (AM peak)	13,500 boardings (800 local trips, 12,700 to north) in the AM Peak. 3,000 more trips are facilitated by building the stations
			New cycle users	Number of new daily cycle movements in BC area	25,000 daily active mode trips (9,000 cycle and 16,000 walk trips) going to or departing from Paerata, Drury Central and Drury West stations
			Access to PT network	Catchment (population and jobs) within 1.2km of stations	79,000 people (21% of people) and 12,000 jobs (13% of jobs) within 1.2km of stations
				Catchment (population and jobs) within 2km of stations (% / No.)	38% or 137,000 people/ 21% or 19,000 jobs within 2km cycle of stations
				Catchment (population and jobs) within 5km drive of stations	82% or 277,000 people/ 48% or 44,000 jobs within 5km drive of P&R stations
			Access to Active Mode network	Catchment within 400m cycle of QoS1 / Regional cycle network	17,000 houses (12%) / 46,000 people (12%) / 9,000 jobs (10%) in South Region within the400m catchment , which provides as access ways to the new stations
				Number of active mode trips in AM peak	• **All South:** 42,000 trips in AM peak or 0.44/capita daily. **Drury**: 6,400 trips in AM peak or 0.43/capita daily. **Pukekohe/Paerata:** 2,300 trips in AM peak or 0.50/capita daily. • 25,000 daily trips are generated by cycling and walking trips to/from the new stations
		Improved connectivity and accessibility for future urban areas in Auckland	Access to jobs	Jobs within 45 mins and 60 mins by PT in AM peak (%/No.)	• 10% of all jobs in Auckland are accessible within 45mins via PT from Drury and Pukekohe in the preferred option. Do-min (no stations) comparison: 5% Drury and 3% Pukekohe. • 31% of all Auckland jobs are accessible in 60mins via PT from Drury, and 25% from Pukekohe. Do-min (no stations) comparison: only 12% are accessible from Drury and Pukekohe.
				Number of jobs within 1.2 km from a rail station	75,500 people / 11,700 jobs within 1.2km of stations
			Access to PT facilities	Number of train stations that are fully accessible in BC area	3 new stations within 18km & 2 existing stations (Papakura and Pukekohe)
				Boardings / Alighting at each station in AM Peak	The total boarding/alighting at Pukekohe is approx. 3,300 people, and Papakura is 2,900
					New Stations / *Boarding* / *Alighting* / *Total* *Paerata* / *4,100* / *300* / *4,400* *Drury West* / *2,500* / *300* / *2,800* *Drury Central* / *2,400* / *800* / *3,200*
				% / No. of rail patronage accessing stations by PT/Active Modes/P&R	*New Stations* / *PT %* / *Active Modes %* / *P&R %* *Paerata* / *7%* / *55%* / *39%* *Drury West* / *10%* / *78%* / *12%* *Drury Central* / *17%* / *71%* / *12%*
				Average travel time by PT to key destinations (CBD, Airport, Manukau). Comparison of Preferred Option with do-min scenario (2-tracks, no stations)	/ *Drury Pref* / *Drury DM* / *Pukekohe Pref* / *Pukekohe DM* *Manukau* / *64* / *82* / *73* / *78* *Airport* / *73* / *98* / *85* / *90* *CBD* / *71* / *86* / *85* / *90*
			Temporal availability (PT)	Public transport frequency per hour weighted by percentage of the population living within 500m of FTN stops or 1.2km from rail station	21% of south population within 1.2km of stations – 10min northbound train frequency (AM Peak) 23% of south population within 500m of FTN stops – 8mins northbound bus frequency (AM peak)
		Increase certainty of FULSS land use release	Housing / Jobs yield delivery	Proportion of new FULSS houses/jobs benefiting from infrastructure	77% of houses in the South benefit from increased access to rail infrastructure, and 50% of jobs
		Improved quality of the urban environment	Access - perception	Perception of safety and ease of walking and cycling	Accessibility to the stations via dedicated sections and crossing for active mode users included in each station plan, making this an attractive option accessible from all sides of each station
				KMs of new and improved transport network with sufficient active modes crossings / corridor width appropriate to the known place function, built form and movement function	14 km (Regional active mode corridor) which provides access to the new stations
				KMs of new and improved transport network with sufficient space for street furniture/lighting and tree planting appropriate to the known place function and built form	14 km along the regional active mode corridor. Amenities at each station
			Changes in human health	Physical health benefits from active modes	Mode shift attainable through provision of facilities at/leading to stations for a range of modes (e.g. through bike storage, bus interchanges etc.). Greater active mode usage to reach stations provides physical benefits through user movement during their first/last mile of each trip.
				Reduction of N02 (tons/year)	Preferred Option produces 967 less tons per year than the Do Min
				Reduction of PM10 (tons/year)	Preferred Option produces 1,446 less tons per year than the Do Min

	Problems	Investment Objectives	Benefits	KPI	Measure	Results
Regional Active Mode Corridor	**PS1:** The lack of safe and attractive active mode facility between growth areas and transport interchanges will restrict travel choice, resulting in poor access to economic and social opportunities from Drury and Pukekohe	**IO1:** Provision of a safe, attractive and direct active mode facility to enable mode shift to active modes and sustainable mobility between Drury and Pukekohe, and the wider walk / cycle network	Improved sustainability and climate change resilience of the transport system	Emission - CO2	Tonnes of CO2 equivalents emitted	With the AMC vs without the AMC CO2: 0.4 tons/day less with the AMC
				Mode shift from single occupancy private vehicle	Fuel consumption and VKT	With the AMC vs without the AMC: • Fuel Consumption: 150 litres/day less with AMC • VKT: 4,300 VKT/day less by car with the AMC
					cycle KMs and walk KMs	Assessment of with AMC vs without AMC Preferred Option shows: • Cycle KMs: 3,000kms/day more with AMC (0.8% trip increase for the whole South region) • Walk KMs: 3,100kms/day more with AMC (0.2% trip increase for the whole South region)
				Provision of high quality active modes network	% / KMs of new and improved cycle network achieving required QoS	14km of regional active mode corridor. 3km of on-road facilities (Pukekohe section). Total of 17km of new segregated facilities