



Auckland Rail Programme Business Case

Overview and economic impacts

August 2024

The Auckland Rail Programme Business Case (PBC) was jointly undertaken by KiwiRail and AT across 2021-2023 to determine the needs of the network over the next 30 years. It sets out a programme of investment to meet these needs and support the vision for rail in the New Zealand Rail Plan.

Auckland Rail Network

Auckland's rail network accommodates:

- Metro passenger services, primarily focused on the city centre, which form the backbone of Auckland's Rapid Transit Network (RTN).
- Inter-regional commuter and tourism services to and from Hamilton and Wellington.
- Freight services, which form a key component of the national freight supply chain.

These services connect ports, industry, employment and population centres. The service level and capacity of Auckland's rail network is of national importance.

Rail Facts and Figures

- There were 20.8m passenger rail trips in 2018 out of 100.3m total PT trips (21% of PT trips were by rail).
- Passenger rail's mode share is 11% of the addressable market (rail is not an available option for large parts of Auckland).
- Rail freight's mode share is around 13% (net tonne-km) of the addressable market.
- Rail freight into/out of Auckland is 5.7m tonnes or 1.18b net tonne-km (2023).

The Starting Point for the PBC: current Network Development Programme, and AT's Rapid Transit Network Strategy

Auckland's rail network is undergoing a major transformation.

- The City Rail Link (CRL) resolves the bottleneck at Britomart Station, creates two new city centre stations and doubles the capacity of the inner network.
- Electrification is underway between Pukekohe and Papakura and three new stations are under construction (Drury, Ngākōroa and Paerātā).
- The Third Main section between Westfield and Wiri junctions is a step towards enabling commuter and freight trains to operate independently between Wiri and Quay Park.
- Early safety improvements at 6 pedestrian crossings and 1 pedestrian & road crossing to support the CRL timetable.
- The Rail Network Rebuild will raise the standard of the network and increase reliability and frequency ahead of CRL opening for the highest priorities areas.
- Port strategy indicates a range of futures possible and in the base case assumes the status quo at Auckland.
- AT's RTN Strategy (2023) set the metro guidelines for the PBC including an aspiration for all day high frequency metro, and no network extensions for rail to the north or south.
- The PBC predated the cancelling of the Auckland Light Rail Corridor by the national government.

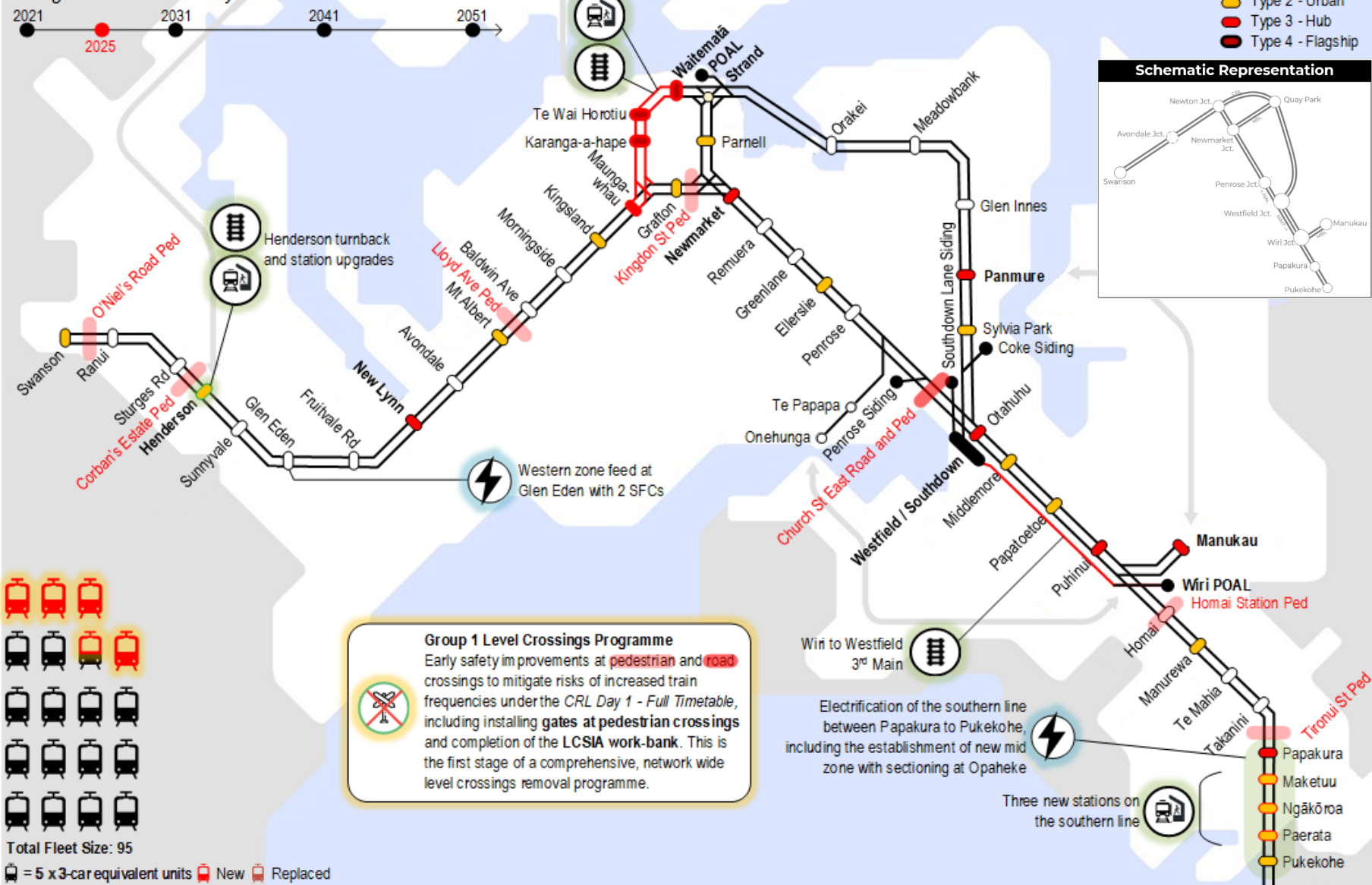
The rail network post CRL construction, the RTN Strategy and these network upgrades form the starting point for the PBC.

This is shown on the next slide.

Rail Network post CRL – Starting Point for the Auckland Rail PBC

Auckland Rail Network Infrastructure Plan

Configuration State 0: City Rail Link



RAIL NETWORK PRE PBC

The Case for Investment in the Rail Network in Auckland

Strategic Context: Why we need to invest in rail

The CRL and Growth

The CRL is designed to enable significantly higher train volumes than current day levels and AT has plans to increase metro service frequencies accordingly.

However, the capacity of the wider network will effectively be fully utilised soon after the opening of the CRL, as the capacity of the CRL is higher than that of the rest of the network.

The Challenges of a Mixed-Use Rail Network

Auckland does not have a metro railway – it is a mixed mode railway with multiple users. The mixed-use nature of Auckland's rail network means that passenger (metro and inter-regional) and freight services must share track space in most places.

Mixed use networks – essentially stopping and non-stopping trains - are inherently more complicated and less reliable than dedicated use networks. Consequently, a mixed-mode network is less 'capacity-efficient' than a dedicated network for a single mode (by around 10%). This is because the operational characteristics of an all-stops metro, express passenger and freight differ.

This **challenge can be reduced by adopting a more segregated approach for trains with different characteristics** (e.g. metro vs freight). Metro trains accelerate and decelerate quickly, with frequent stops. Freight takes a long time to speed up and slow down, with few stops. Express metro and long-distance passenger trains share the nimbleness of metro services but make few stops. The PBC recommends, where possible, that freight, regional and express services should be separated from all-stop metro services.

Problems to be addressed

- **Poor levels of service** deter passengers and freight customers. Issues include; reliability and punctuality, frequency, service timing, service travel time, directness, and metro station and overall network accessibility and safety.
- **Inadequate maintenance and renewals** impacts service reliability and punctuality, which will worsen as train volumes increase. This is compounded when capacity is constrained, as the system struggles to recover.
- **Capacity constraints** mean projected growth in freight and passengers cannot be accommodated. Mode shift to rail will not be achieved and government's committed emission reduction targets will not be met.

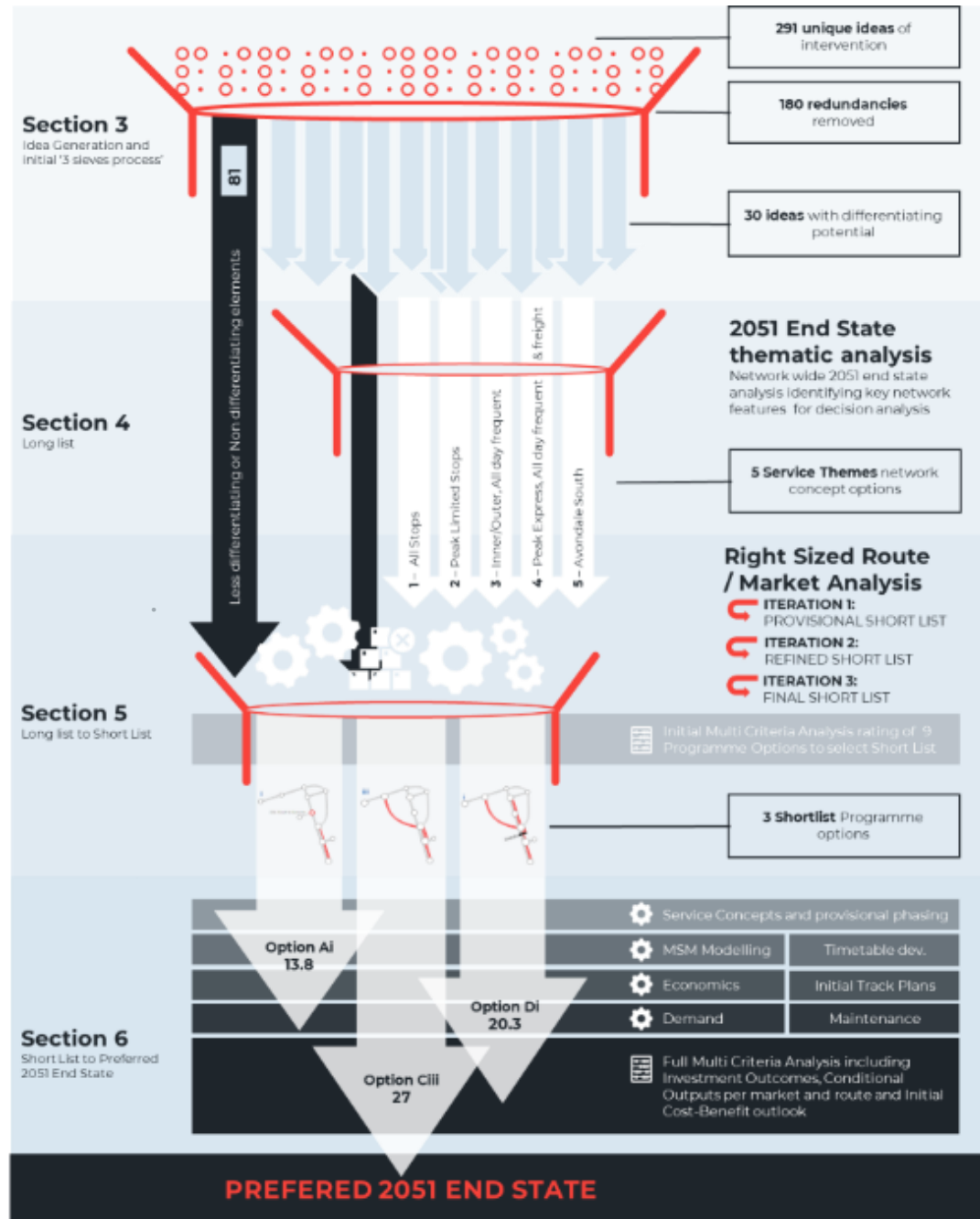
Investment Objectives

- The Auckland rail network is **resilient and reliable** for the future.
- Continually **increase the use of rail** for all markets in Auckland over the next 30 years, by increasing its attractiveness. (Improve: reliability, frequency, capacity, and travel time).
- **Reduce Auckland's net transport emissions** by increasing rail's mode share over the next 30 years.
- The Auckland rail network **supports and enables a denser urban form** within the metro station catchments within the next 30 years.

Option Assessment

The optioneering process to develop the final 30-year investment programme consisted of two parts.

- Part 1 determined the desired end state for the network in 2051, including enhancements to services and the supporting infrastructure investments required to enable them. The outcome was an Initial Preferred 2051 end state.
- Part 2 then determined the phasing of investments over time, inclusive of refinements to the end state and the development of a Final Preferred Programme.
- A multi-step process was used to assess nine infrastructure programmes in an iterative manner, generating a provisional short list, followed by the final short list.
- With each iteration, further technical analysis and assessment enabled the gradual validation of assumptions, findings, and priorities.
- This was instrumental in providing a greater understanding of the key components to be delivered to achieve the desired future state of the network.



The Preferred Investment Programme

Preferred Option Best Achieves Outcomes Sought

The comprehensive assessment of options determined that the outcomes sought will be best achieved through targeted investment in six key areas:

- **Maintenance and renewals:** Step change in maintenance and renewals levels and delivery methods leading to improved reliability, and reduced disruption from track works. New high-capacity maintenance and renewals equipment, heavy maintenance facility, stabling yards and maintenance sidings.
- **Segregate rail modes** as much as possible: 4-track between Westfield and Pukekohe & grade separate Westfield Junction for more express services and faster, more frequent trips. The Avondale – Southdown corridor enables further partial segregation of freight to Northland from passenger services. Rail can better respond to growth at upper North Island ports and the inner-city network can provide more frequent, faster passenger journeys.
- **Fleet, depots and stabling:** 72 new 3-car EMU and associated stabling requirements to meet increased demand.
- **Level crossing removals:** Grade separate or close 34 (road and pedestrian) crossings so the network can operate at maximum efficiency with optimum safety outcomes.
- **Signalling and power:** Upgrades including two new power feeds, network signalling system upgrade to European Train Control System Level 2, Automated Train Operations, traffic management systems and signal block enhancement.
- **Station upgrades:** Upgrades including platform fitout and amenities, new platforms and turn-backs. Platform extensions to support 9-car services and future proofing for full 9-car operations beyond 2051.

A comprehensive transport package that aims to get the most out of the existing network, improve customer experiences, and deliver on significant forecast growth.

Achieving the Future Vision for Metro and Freight

The two priority track projects of 4-Tracking Westfield to Pukekohe and the Avondale-Southdown corridor will significantly enhance capacity for freight and passenger services, connectivity and resilience and enable the level of mode shift required to deliver the programme benefits:

- **4 Tracking from Westfield to Pukekohe:**
 - Provides higher frequencies and express services for those passengers with the longest journey times, maximising emissions and congestion reduction.
 - Allows for growth in freight demand beyond the mid-2030s, when capacity for longer freight trains is needed.
 - Without 4-tracking to Pukekohe, freight benefits can only be achieved at the expense of equally valuable passenger services.
- **The Avondale-Southdown corridor** significantly enhances the network by:
 - Increasing operational efficiency through removing most freight services from the congested inner Auckland network and allowing more intensive passenger operations, including enabling express passenger services from the south to continue north of Westfield.
 - Creating a new Crosstown corridor for passenger services and freight.

There is urgency to progress with these projects now given the lead times required for planning and construction.

4-Tracking and Avondale-Southdown – Impact on Critical Issues

Critical Issues facing the rail network

The PBC identified the critical issues (deficiencies, constraints) that need to be addressed to achieve the future desired benefits of the rail network. Using this approach potential infrastructure and service solutions were analysed and an order of priority established.

Avondale – Southdown and the Critical issues

- **Critical issue C: Achieving meaningful and reliable journey time savings from the south** (~45min from Pukekohe to city centre via a limited stops express services). Whilst 4-tracking the southern corridor is key, this alone does not provide sufficient service reliability nor an all-day solution (as track capacity north of Westfield Junction will still be shared).
- **Critical Issue B: Inadequate freight capacity to the north:** The biggest barrier to providing adequate and reliable freight services to and from Northland in the future is the capacity of the Auckland rail network between Newton and Newmarket (N2N). This includes the high volume, flat junction at Newmarket station. Accommodating future freight services within the existing rail network will result in slower and less reliable trips for passengers.
- The preferred solution that addresses **critical issues A and B** is to construct the Avondale – Southdown link as a two-track railway, catering for both freight and metro services. 4-tracking the NAL to Newmarket or a Newton to Newmarket tunnel bypass were considered but discounted in favour of the Avondale – Southdown corridor, which provides broader benefits as well as lowest cost.
- **Critical Issue E: Poor crosstown connection.** Development of the Avondale-Southdown corridor will provide meaningful capacity and optionality through crosstown connectivity, including Mt Roskill and Onehunga as it connects west to east across Auckland.
- **Critical Issue F: Insufficient maintenance access.** A two track Avondale – Southdown corridor also contributes significantly to improving access for network maintenance. This link will help to enable a strategy whereby a maintenance work zone is able to be established in the centre of the network whilst services continue to operate via other routes, including Avondale – Southdown.

Of the options assessed, the Avondale – Southdown corridor and 4-Tracking best address the most critical issues.

4-Tracking and the critical issues

- **Critical Issue A: Insufficient capacity in the south.** There is insufficient capacity to meet projected demand in 2051 on the southern part of the network. The only viable solution to this capacity problem is to 4-track the corridor
- **Critical Issue C: Achieving meaningful and reliable journey time savings from the south** (~45min from Pukekohe to city centre via a limited stops express services). This requires a more efficient timetable/operation (saves up to 13mins) and express services (saves 10min). Express trains need the ability to pass all-stops metro trains from Papakura to the CBD, requiring 4-tracks along this entire segment. 4-tracking from Westfield South would make a significant difference here but is not a panacea (see adjacent box about Avondale-Southdown corridor).
- **Critical Issue D: Wiri to Westfield capacity and utilisation.** The most significant issue post CRL opening. The highest volume of passenger and freight movements across the network converge in this area, forming a critical capacity bottleneck. The volume of passenger services cannot be accommodated on two tracks. Freight movements are at the limit of what could be reliably operated and rely on the east side of the corridor (designated for passenger services). 4-tracking Wiri to Westfield provides much needed capacity, but even this may not be enough.
- **Critical Issue F: Insufficient maintenance access.** Improved maintenance access is required to maintain freight and passenger services at a reasonable level of service. A combination of targeted 4-tracking (allowing closure of two tracks for maintenance) and diversity of routing was considered to be the most feasible strategy.

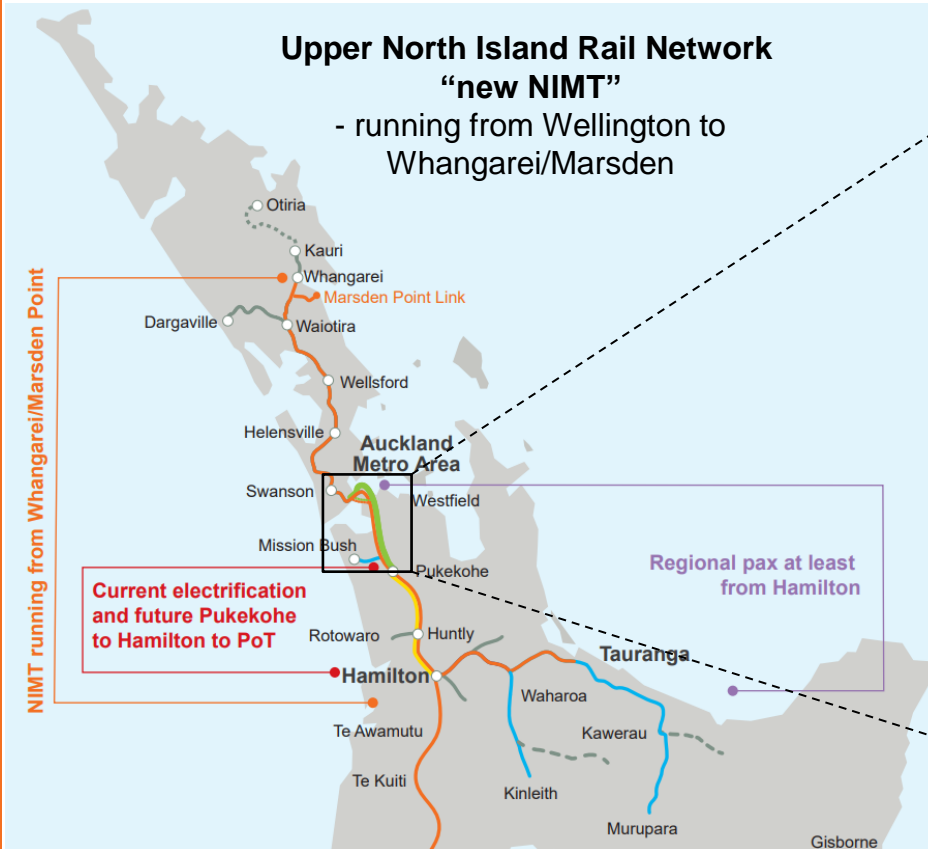
Achieving the future vision – a segregated metro network

The major track elements of the programme form a strategic vision for both future metro and future freight networks.

Upper North Island Rail Network

“new NIMT”

- running from Wellington to Whangarei/Marsden



Metro network created by new NIMT



— North Island Main Trunk (NIMT)
— Exclusive metro use
⋯ Dotted lines = shared use

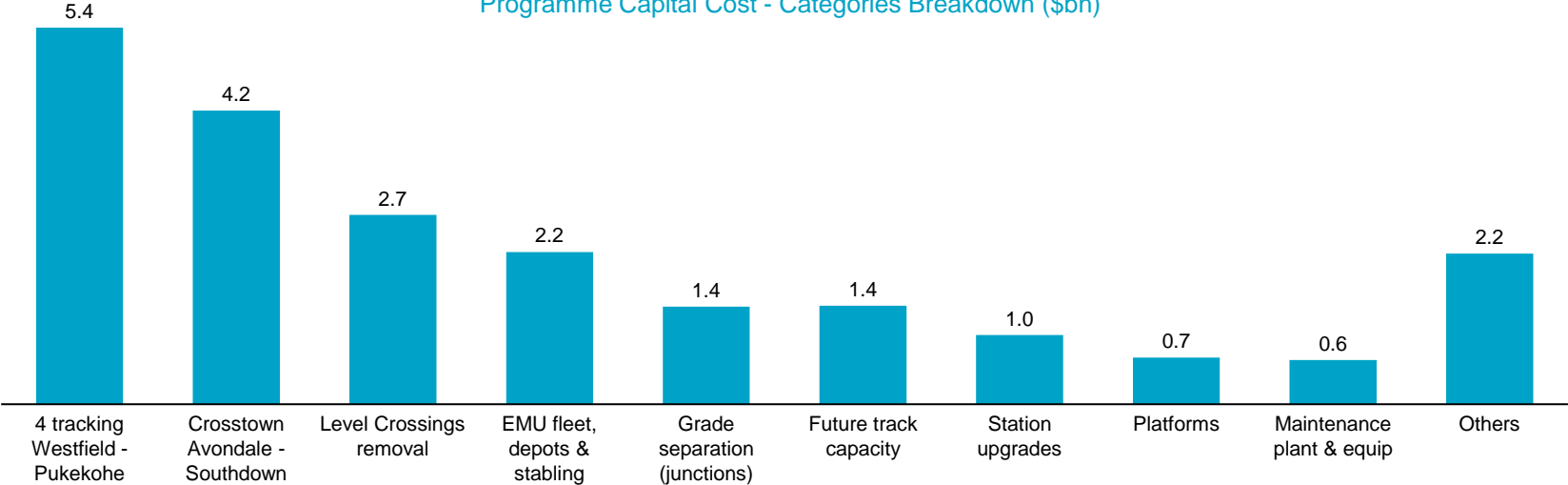
Key features:

- Full segregation to the south between stopping and through trains via the 3rd and 4th main lines.
- Intense metro passenger centric services from Pukekohe around the waterfront, through the CRL and middle of the isthmus.
- A shared freight and metro service to the south of the isthmus using the crosstown Southdown – Avondale line.
- North Island Main Trunk (NIMT) runs from Wellington to Whangarei/Marsden Point via Avondale-Southdown, bypassing the central isthmus which is then freed up for intensive metro services.

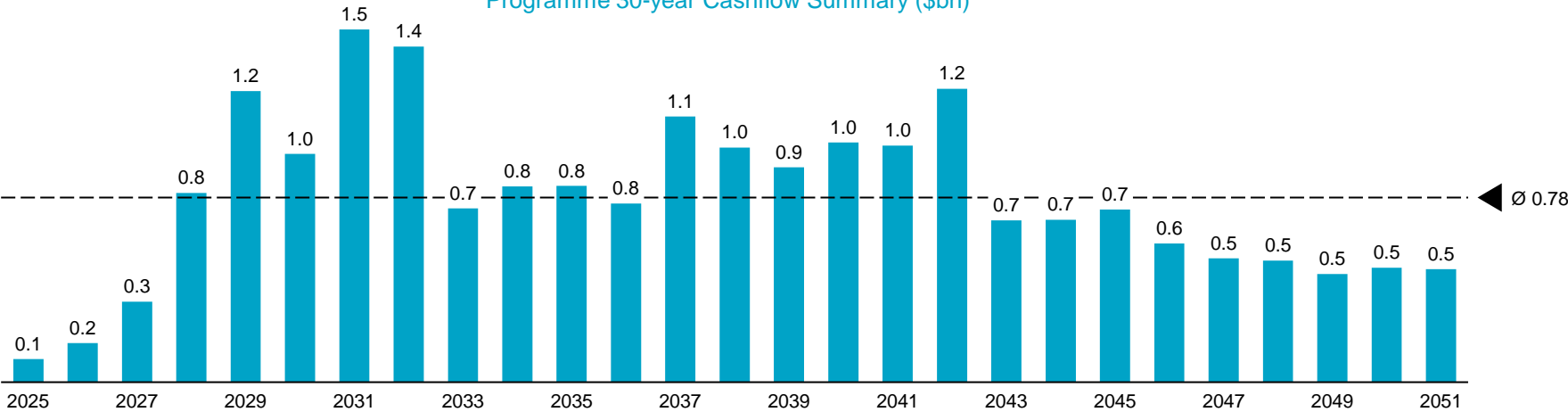
Programme capital cost

The capital cost to deliver the full programme to FY51 is estimated to be in the range of \$21.2bn (P50) – \$28.3bn (P95), over a 30-year period.

Programme Capital Cost - Categories Breakdown (\$bn)






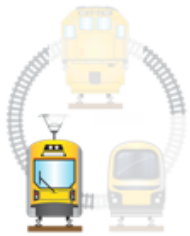
Programme 30-year Cashflow Summary (\$bn)

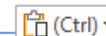


Note: numbers may not add or align due to rounding

The Benefits of the Investment Programme

Market	User Benefits
<p>Maintenance</p> 	<p>More reliable, resilient, and robust infrastructure and services, by:</p> <ul style="list-style-type: none"> • Widening effective window by 30-50% to 6 hours per night, planned proactively and rolling across targeted segments of the network • Improved productivity and safety with right sized plant and equipment. • Reduced reliance on block of line. • Staff and public safety improvements. • Ability to run services during maintenance on adjacent main(s).
<p>Freight</p> 	<ul style="list-style-type: none"> • Longer trains enabled for greater economic and operational efficiency. • Significant capacity increases on all major freight lines: <ul style="list-style-type: none"> – NIMT 30 trains per day (tpd) x 750/900m max -> 30tpd @ 1,500m (equiv. 120tpd @ 750m) up to 200% increase – NAL 5-7tpd -> 16tpd >300% increase – POAL 6-8tpd -> 26tpd >300% increase • Optimal timetabling enabled with all metro exclusion periods removed

Market	User Benefits
<p>Inter-Regional</p> 	<ul style="list-style-type: none"> • Improved journey times with >10min travel time savings over current day • Increased capacity, with a 30min frequency enabled all day, and longer trains (up to double current lengths) • Improved access to Auckland City Centre, with trains routed via Newmarket, with direct platform transfer to metro trains arriving every 3-4 mins.
<p>Metro</p> 	<ul style="list-style-type: none"> • Increased capacity with longer trains and more frequent services on all lines: <ul style="list-style-type: none"> – Eastern Line: Up to 12tph, all 6-car trains (200% increase) – Southern Line: 14tph all stations, 6 and 9-car (express) trains (170-350% increase) – Western Line: Up to 16tph, all 6-car trains (270% increase) • RTN frequency of 10min or better on all lines, all day • Travel times of 45min or better to the city centre for 95% stations • Southern express services operating all day with savings of up to 15min over current timetable. • A new crosstown heavy rail connection between west and east Auckland, and transfers to Auckland Light Rail



A BCR of 1.2 including wider economic benefits (1.0 excluding WEBs).

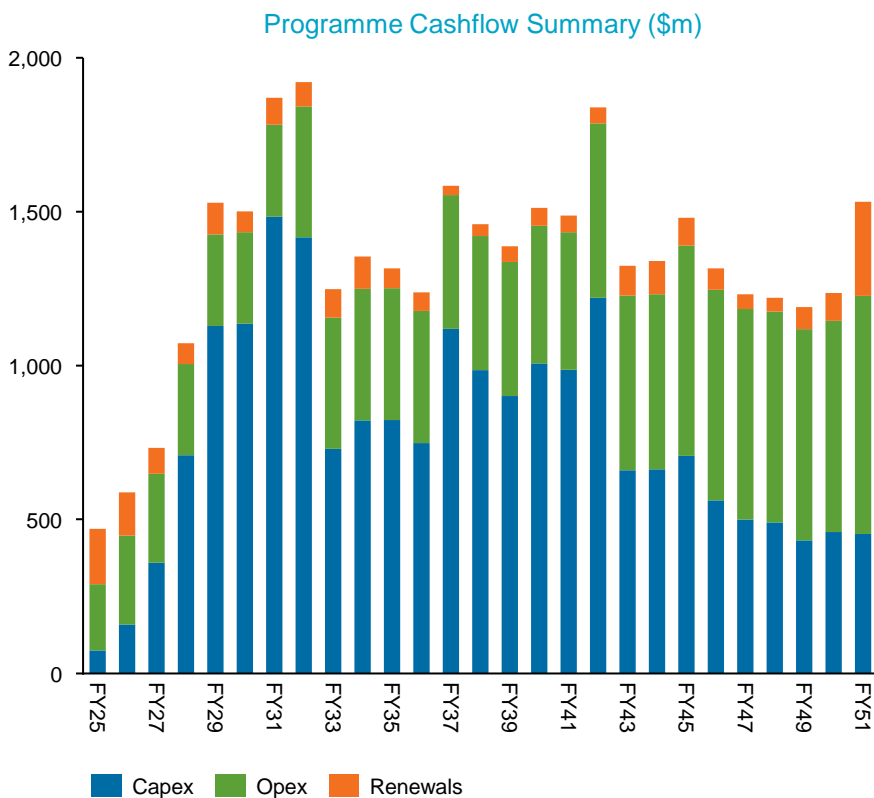
Programme Lifecycle Costs

The total cost to deliver the recommended programme to 2051 is estimated to be \$54.1bn (P50, escalated).

This is comprised of 56% for capital projects, 37% for operating costs and 7% for renewals.

The funding requirement includes renewals and operating costs that are expected to be included in a 'minimum investment programme' as part of continuous programmes, regardless of whether additional capital investment is made.

The capital programme is anticipating a spend of up to \$1.5bn per annum at peak (P50, real)



Funding and Affordability

The level of investment needed to deliver the full programme will place pressure on both traditional and potential funding sources. The overall capex programme is \$21.2bn (P50) – \$28.3bn (P95).

The immediate funding requirement in the next 3-4 years is critical to enable a lift in productivity for maintenance and renewals activity and to progress business casing.

Years 1-4 Funding Requirement

Total funding required (\$m) by spend category	FY25	FY26	FY27	FY28	FY29
Total capex	74	158	359	708	1,129
Total renewals	180	141	84	68	103
Total opex	215	289	289	296	296
Total funding required (real)	470	588	732	1,072	1,528
Escalation	30	53	87	158	271
Total funding required (nominal)	500	642	819	1,230	1,800

Short-term funding is also important to secure designations for critical programme elements such as 4-tracking between Westfield and Pukekohe and a new EMU depot. Putting in place the appropriate planning protections now will ensure these programme components are not precluded in the future, even if implementation funding is unconfirmed. It will also accelerate delivery if and when delivery funding is confirmed.

Although the immediate funding requirement is relatively low, the substantial cost associated with bulk property acquisition and construction, which is forecast from year 4 onwards, will create an affordability challenge.

Under the previous, more generous GPS funding settings, the programme utilises an increasing share of the Public Transport Infrastructure activity class range, reaching nearly 180% of the upper bound range (over 300% of the lower bound range) in FY31.

Given this funding is for all PT infrastructure activities nationally, it strongly suggests that the current funding arrangements will need to be changed if the recommended programme is to be delivered.

The Commercial Case at PBC stage summarises the potential procurement approaches for the projects and components in the programme (focussing on immediate business casing and route protection needs).

Delivery Approach over Time

For most projects within the programme, the implementation phase is many years away and the delivery models will vary.

The components of the overall programme have been organised into six indicative groups of similar types of projects, at similar stages of investigation:

- Group A – Southern Corridor
- Group B – Crosstown Corridor
- Group C – Western and Eastern Corridor
- Group D – Electric multiple unit (EMU) fleet
- Group E – Signalling, telecoms, network control and traction power
- Group F – Maintenance plant, depots/satellite, sidings and renewals.

This will be reviewed post confirmation of the GPS. A detailed procurement strategy will be developed for each project in the programme at an appropriate time, in advance of, and closer to, the implementation of each project.

Progressing Projects

Group F projects to lift reliability through maintenance productivity investments is the highest programme priority.

4-tracking between Westfield and Pukekohe is a key priority. The project has a very long lead time to delivery and the PBC forecasts that it cannot be delivered fast enough to avoid spilling demand. Thus, there is a need to consider the fastest route to completion of the full corridor. For this reason, the PBC has considered a proposed procurement approach for this group of projects to inform Auckland Transport and KiwiRail's immediate next steps in advancing them.

Progressing or maintaining route protection where this will be required in advance of future implementation will be considerably easier and less costly than adopting a just in time strategy, due to long lead times, cost escalation and the risk of other developments encroaching into future corridors e.g.:

- There is pressing need to continue with planning for Avondale-Southdown, as its designation needs to be given effect prior to expiry in mid-2029. Without this, costs and complexity would be vastly increased and could threaten the viability of the corridor.
- Lead time for planning in south means there is a real risk that housing intensification will occur in advance of ability to offer improved public transport choices.

Deliverability & Next Steps

Benefit Realisation

The benefits of investment arise from the interactions of the whole programme, not its separate component parts and are therefore reliant on the delivery of the whole programme. The same range of benefits will not arise if elements within the programme are not delivered.

Resilience, Uncertainty and Prioritisation

Although the programme elements themselves are resilient to a range of different futures, a range of future uncertainties could influence the grouping, prioritisation, and delivery timing of projects within the programme. These have been captured.

Uncertainties could include decisions about the future capacity and location of the Port of Auckland and emissions reduction priorities and timing.

The Five-Year Plan

In the next five years, after endorsement of the PBC, the following outputs are sought:

- Projects to improve maintenance productivity and support operational efficiency are implemented.
- Route protection undertaken for projects that require an increased designation footprint.
- Consenting, design and construction procurement begins for projects that have a confirmed designation (or that do not require significant additional land beyond existing designations).
- Programme optimisation – to confirm minimum technical requirements, the nature of interdependencies and how the programme is best structured to balance time, cost, and quality.
- Business cases undertaken to confirm the recommended rail network and enable investors to make decisions on whether projects will proceed directly to the implementation phase or alternatively to route protect corridors for longer term projects.

Focus on Delivery

A key imperative for Auckland Transport and KiwiRail is to identify opportunities to reduce cost and the lead time to construction.

A collaborative approach to programme delivery could provide options for both organisations to deliver projects of the size, complexity, geographical spread, and multiple interfaces (social, economic, environmental, technical, operational).

Projects with high complexity, high consenting risk, large footprint requirements, and urgency in terms of delivery to meet demand, require rapid progress of next stages (e.g., business cases and NoRs).

These projects have significant cost requirements and long lead times to secure funding and deliver. Prompt progress of these planning phases is intended to reduce the lead time to construction.

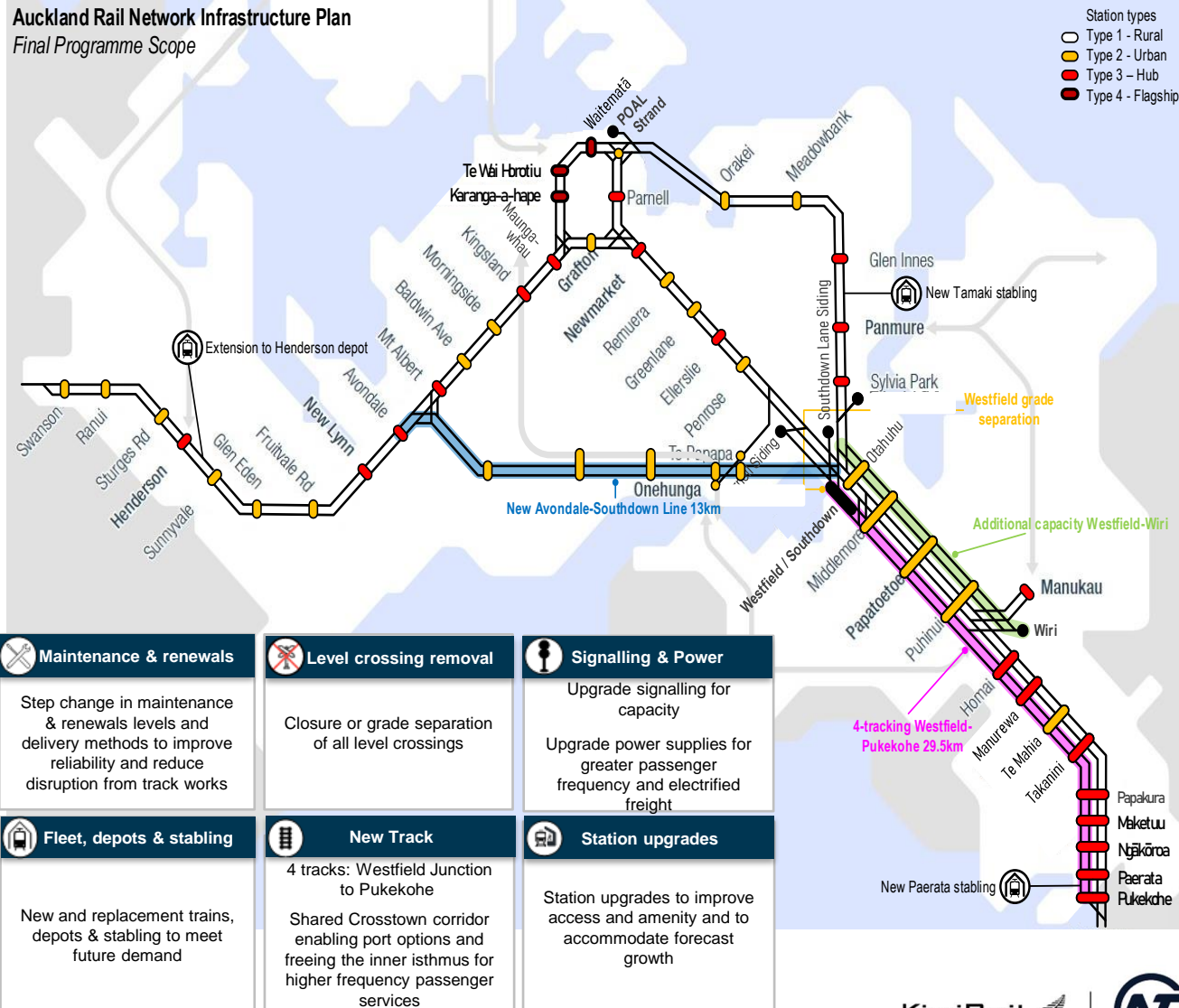
Outcome of the Auckland Rail PBC

A comprehensive 30-year pipeline of investment in Auckland's rail network to support the vision for rail in the New Zealand Rail Plan.

The comprehensive 30-year investment programme delivers these improvements:

- Higher capacity maintenance plant and equipment, heavy maintenance facilities, additional sidings for maintenance.
- Southern line (Westfield – Pukekohe) 4-track capacity expansion.
- New Avondale-Southdown cross town line.
- Additional EMU fleet and depot improvements.
- Signalling and power feed improvements.
- All level crossings removed.
- Stations upgraded to meet Auckland Transport TDM requirements and platforms extended to accommodate 9-car EMUs.
- Wiri – Westfield additional capacity expansion.

Auckland Rail Network Infrastructure Plan
Final Programme Scope



Benefits of the Investment Programme

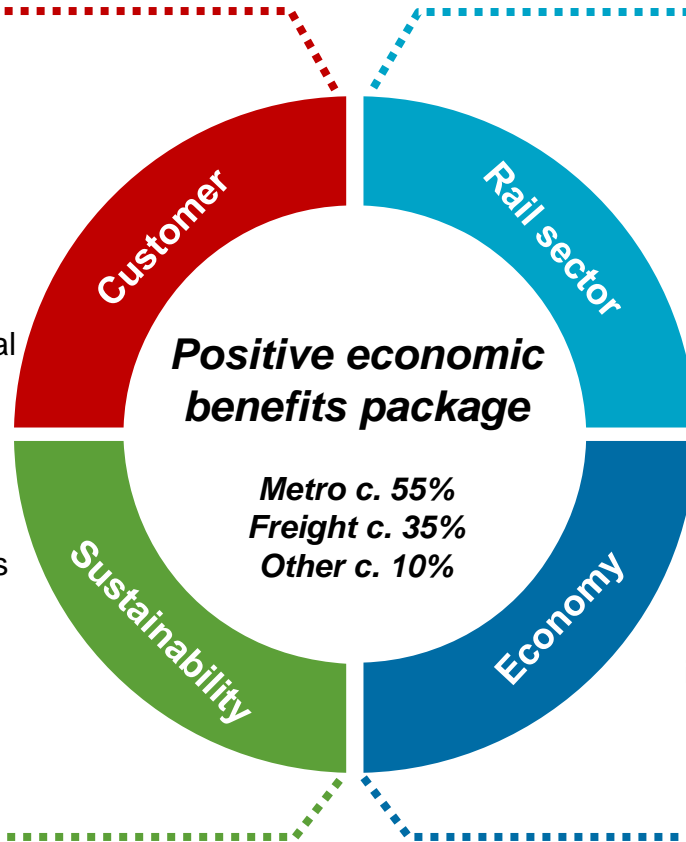
The 30-year pipeline of investment in Auckland's rail network delivers significant benefits.

Customer benefits

- Triple duty - for metro, regional & freight customers at once
- Step-change in levels of service & frequency
- More reliable, less disruption
- Well connected & integrated to local and regional networks

Sustainable transport

- Key to delivering regional and national emission-reduction targets
- Reducing congestion to support ongoing growth
- Improve safety and reduce road maintenance and renewals costs



Rail sector

- Sustainable pipeline of work
 - Certainty for firms to invest
- New industries and opportunities
 - Building a skilled workforce
 - Employment

Economic development

- Access to opportunities
- Local and Regional connections
 - Improved national and international supply chain efficiency and productivity
- Decongesting Auckland's transport network

Challenges for the Investment Programme

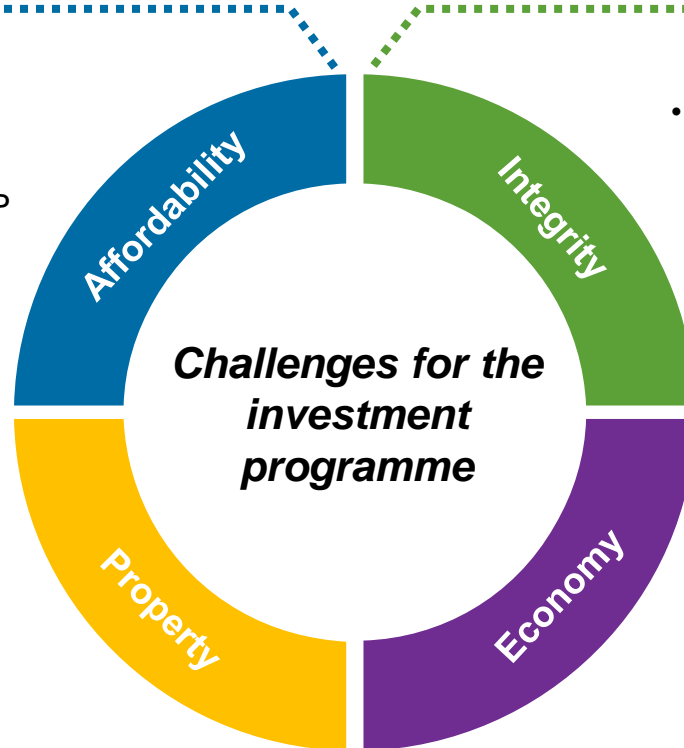
As with all major investment programmes upgrading Auckland's rail network will present challenges.

Affordability

- Not affordable under current mechanisms
- Programme exceeds current NLTP
- Alternative funding required to provide certainty
- Competing with mega-projects

Land acquisition

- Urgency to protect KiwiRail's corridor to support desired mode shift
- Long term funding certainty for land acquisitions is needed



Programme integrity

- Benefits arise from the whole package – not its component parts
- Cherry-picking may undermine the benefits
- System view must be maintained
- OPEX funding to match CAPEX

Social license

- Community engagement and support
 - Integrated planning
- Support at a local and national level

Auckland Rail PBC Strategic Rail Programme

Key Takeaways



Appropriate and ongoing investment in **maintenance and renewals** is the highest priority and is a necessity regardless of other investment

There is also need to **segregate the rail network from roads** – removing level crossings to support safety and train frequency



After CRL opens, the network will quickly be essentially full and **new capacity will be needed** to allow for growth

Most of the investment programme is required for metro growth, but **metro alone cannot justify the scale of investment required**



The long **lead time for delivery creates an urgency** to get on and plan now

Benefits to **ALL users** is necessary to **support the scale of investment required**



Mixed use networks are complicated to operate with intensity – and **overall capacity is 10% lower for mixed use** compared to dedicated use

The **benefits package arises from the programme** as a whole – cherry picking will not produce the same benefits



Capacity and reliability require that we **segregate traffic types** as far as possible (especially all-stop and non-stop services)

There is urgency to move to **protect the land requirements** – it will never be cheaper than today



The Strategic Rail Programme will significantly increase the capacity, service levels and resilience of the rail network.

30-Year Rail Programme – national and regional economic impact

The economic and emissions impacts of rail infrastructure improvements An MDG-NZ dynamic Computable General Equilibrium analysis

Sense Partners, Final report, April 2024.

To aid better understanding of its impacts across the NZ economy, KiwiRail commissioned this Computable General Equilibrium (CGE) analysis of the economic and emissions impacts of the 30-year strategic rail programme for Auckland (i.e. the recommendations of the PBC). The analysis extends to 2100 (i.e. 50 years beyond completion of the programme).

It sets out 4 scenarios:

- A **baseline**, in which there is no new investment in the rail network beyond that already committed plus future maintenance and renewals. All other scenarios are compared to this.
- A **Core** scenario, which reflects the investment programme recommended by the Rail PBC
- A *variation* of the Core scenario, which envisages more growth at **Northport** – and brings forward the construction of the Avondale-Southdown corridor (and also removes some additional track investment in the southern corridor no longer required)
- A **Delayed** investment scenario, in which there is limited and later investment only on the southern corridor. Avondale-Southdown is not built.

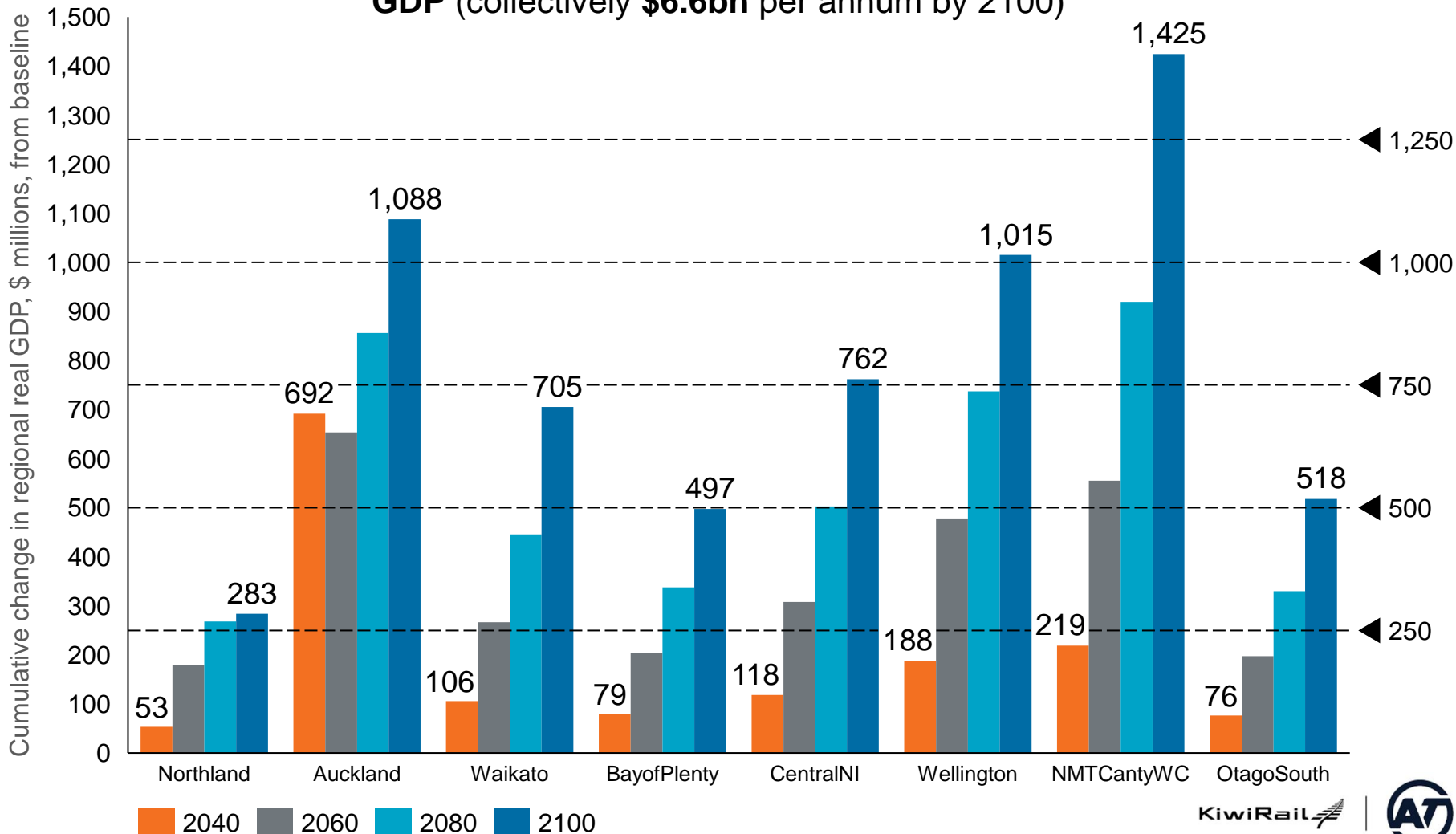
The empirical analysis focuses on what might be considered the ‘conventional’ macroeconomic and emissions impacts of the proposed rail infrastructure improvements. The proposed rail investment would generate several other social and economic benefits that are challenging to include in a CGE model but should be considered as additional to the quantified estimates. These include:

- Safety benefits and time savings associated with the greater use of rail.
- Time savings from reduced road congestion.
- Improved urban design and liveability, which will also present the possibility of opportunities for value capture.
- Reduced road and vehicle maintenance for a given amount of economic activity

Investment in the Auckland rail network delivers solid and ongoing improvements in New Zealand's real GDP that are shared with regions across the country

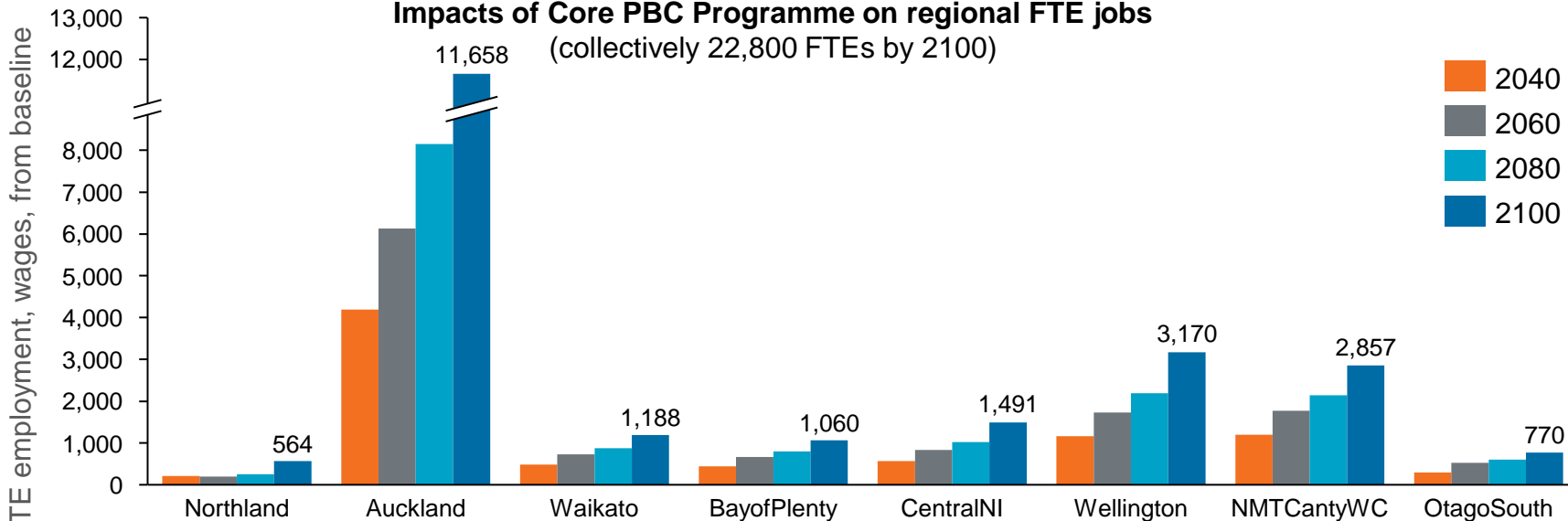
On completion in 2050 the programme will grow national GDP by \$2.2bn per annum – increasing to \$6.6bn per annum after 50 years (in 2100)

Impacts of Core Auckland PBC Programme on regional real GDP (collectively \$6.6bn per annum by 2100)

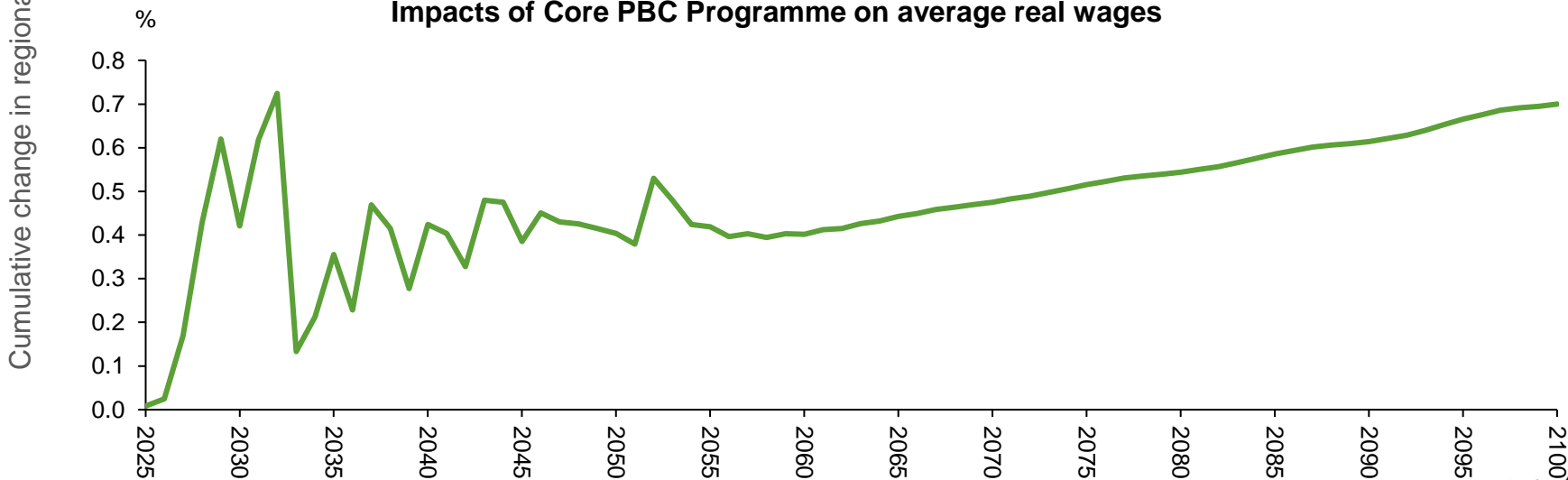


A larger economy means more jobs and higher real wages

Impacts of Core PBC Programme on regional FTE jobs
(collectively 22,800 FTEs by 2100)



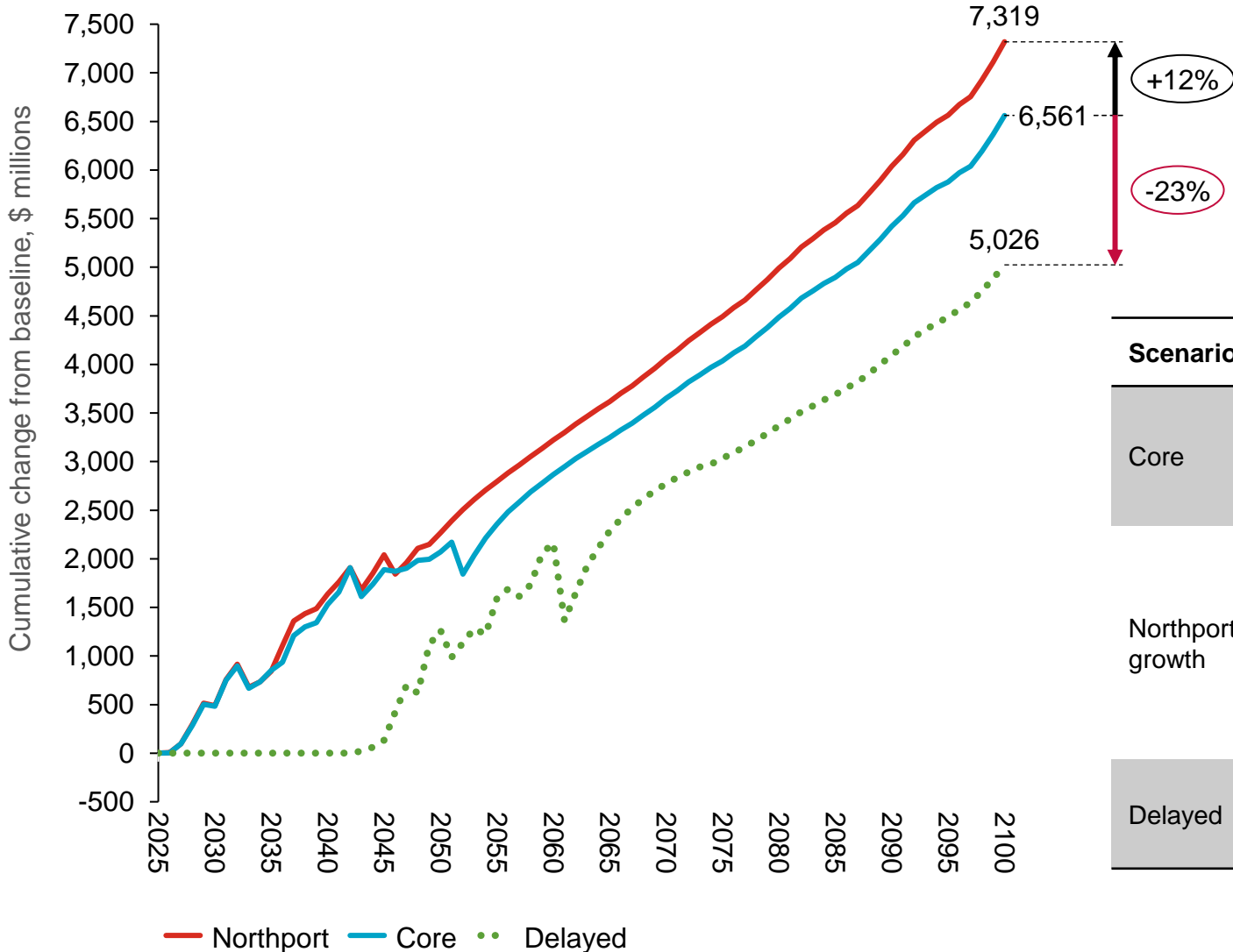
Impacts of Core PBC Programme on average real wages



Programme timing matters

Bringing forward or deferring infrastructure affects overall size of benefits created, not just when they're delivered - the economic benefits of the delayed scenario are 23% lower in 2100 than the core scenario, whilst 'Northport' which brings forward build of the Avondale-Southdown corridor, delivers 12% more.

Real GDP Impacts, \$millions change from baseline (do min)

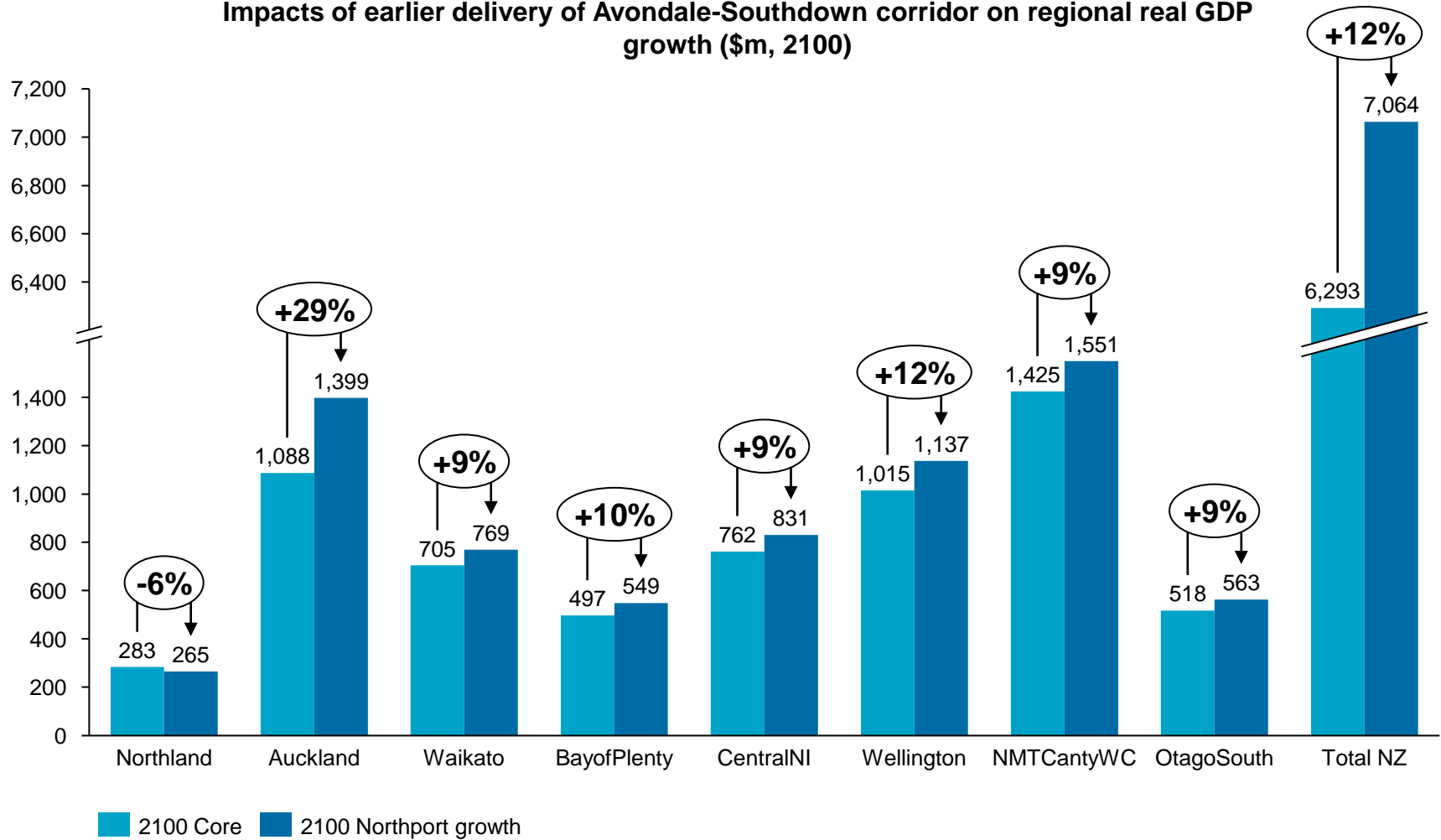


Scenario	High level indication
Core	Per PBC baseline programme, includes both 4 tracking and Avondale-Southdown
Northport growth	Brings forward Avondale-Southdown corridor by 6 years and removes some additional southern corridor investment no longer required
Delayed	4 tracking delayed, Avondale-Southdown not built

And changes the distribution as well as scale of benefits...

The “Northport growth” scenario, bringing forward Avondale-Southdown delivers much larger benefits, especially for Auckland

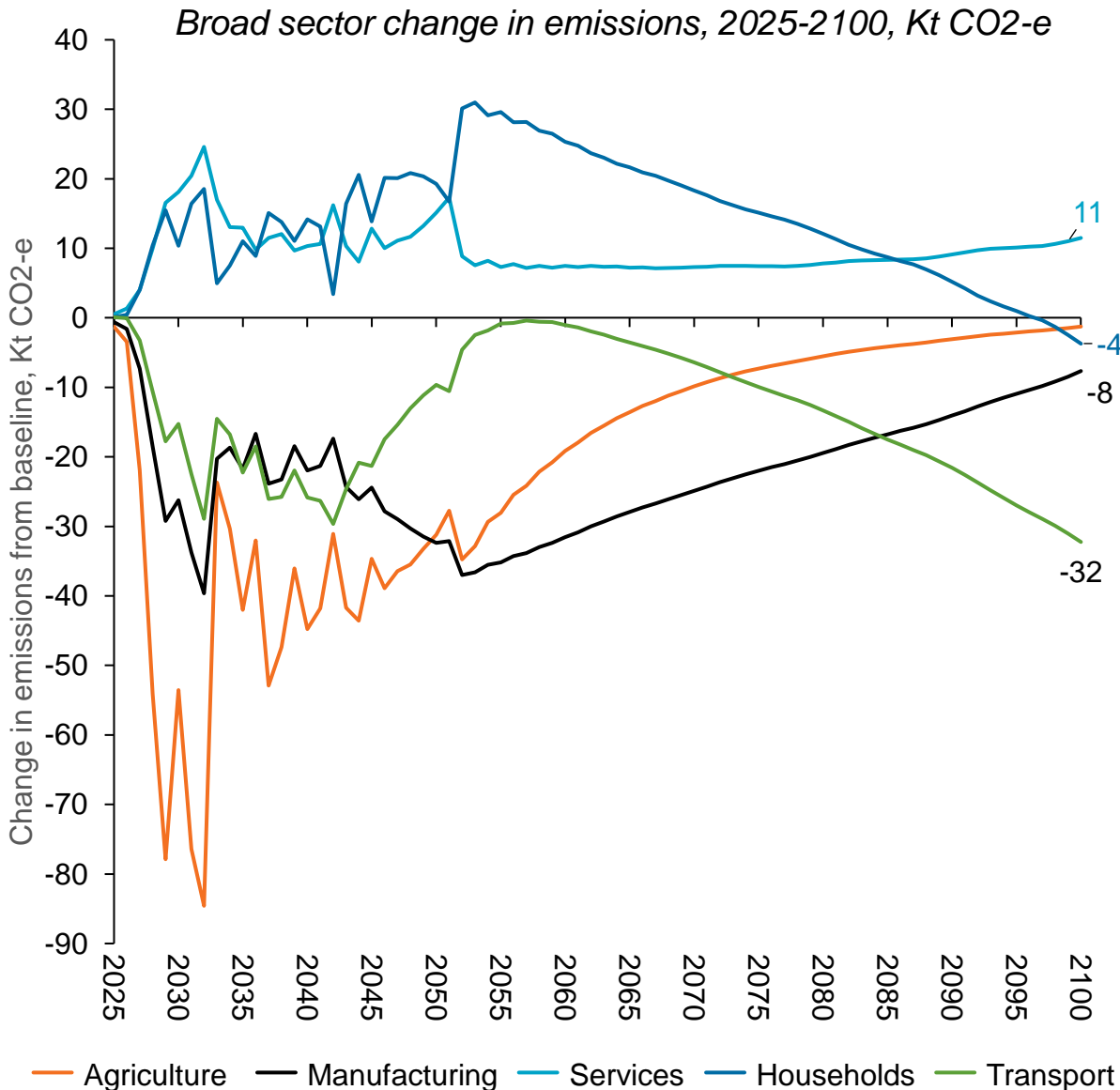
Impacts of earlier delivery of Avondale-Southdown corridor on regional real GDP growth (\$m, 2100)



Note Economy-wide benefits totals are \$6.6bn and \$7.3bn respectively, variation in this chart is due to repeated rounding

A more emissions-efficient economy

The programme would create more emissions-efficiency as transport reductions mean allowances are used more productively



- The agriculture and manufacturing sectors, both of which are heavy users of rail freight, see their emissions fall below baseline, despite their output growing faster.
- Services emissions rise primarily because construction activity is included in this sector.
- Household emissions grow above baseline for most of the projection period as real wages and employment grow
- Over time, the transport sector becomes more emissions-efficient with the shift from road to rail.
- By 2100, **transport emissions are c. 32Kt lower** than they would have been had the freight and passenger demand been met by road transport instead

Summary national-level economic impacts from the 30-Year Auckland Rail Programme investment

The economic and emissions impacts of rail infrastructure improvements
An MDG-NZ dynamic Computable General Equilibrium analysis
Sense Partners, Final report, April 2024.

The analysis finds that the benefits from the collective rail investment include:

- Significant national and regional economic growth. By 2100, real GDP between **\$6.6 billion - \$7.3 billion per annum** greater than it otherwise would have been.
- An estimated additional **22,800-23,700 additional FTE jobs**.
- The higher GDP and employment figures arise if the Avondale-Southdown cross-isthmus corridor is delivered earlier.
- Emissions reductions equating to a transport **emissions 'saving' of 32.3Kt CO2-e** by 2100. These reductions account for both construction emissions and increased travel (due to increased economic growth). The ETS means that economy-wide emissions are held constant but as the programme also increases GDP, this represents an improvement in the emissions-intensity of GDP



For more information on the Auckland strategic rail programme and economic impacts, please visit <https://www.kiwirail.co.nz/our-network/our-regions/amp/strategic-rail-programme/>