OC240098

4 March 2024

Tēnā koe

I refer to your email/letter dated 1 February 2024, requesting the following under the Official Information Act 1982 (the Act):

> "…a copy of the KPMG report referenced on page 6 of this document: https://www.nzta.govt.nz/assets/resources/briefing-for-incoming-minister/briefing-to-the-incoming-minister-2023.pdf"

The following document falls within the scope of your request and is enclosed:

1. *Review of GPS24 Activity Class Range Forecasts - Final report - 15 June 2023*

Certain information has been withheld under section 9(2)(a) of the Act, this is to protect the privacy of natural persons.

With regard to the information that has been withheld under section 9 of the Act, I am satisfied that the reasons for withholding the information at this time are not outweighed by public interest considerations that would make it desirable to make the information available.

You have the right to seek an investigation and review of this response by the Ombudsman, in accordance with section 28(3) of the Act. The relevant details can be found on the Ombudsman's website **www.ombudsman.parliament.nz**

The Ministry publishes our Official Information Act responses and the information contained in our reply to you may be published on the Ministry website. Before publishing we will remove any personal or identifiable information.

Nāku noa, nā

Tim Herbert
Manager Investment

Review of GPS24 Activity Class Range Forecasts

Final report

—

15 June 2023

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Tim Herbert
Manager, Investment
Te Manatū Waka – Ministry of Transport
Wellington

14 June 2023

Dear Tim

GPS24 Review Report

KPMG is providing this final report in line with the Consultancy Services Order' GPS24 Review' dated 6 April 2023. KPMG has been supported by Mott MacDonald in the preparation of this report in line with Mott MacDonald's separate CSO with the Ministry of Transport.

Thank for you the opportunity to work with the Ministry and Waka Kotahi on this critical project.

Kind regards

Joey Shannon
Director

Executive Summary (1 of 2)

Short-term: The forecast NLTP investment provides an adequate basis to inform immediate GPS24 decisions, but the standard of the process is lower than we would expect given the scale of funding

01

NLTP forecasts provide an adequate basis for informing immediate choices around GPS funding ranges

Based on underlying uncertainty and approach we assess the forecasts used to inform activity class ranges as providing moderate confidence. Overall, we consider that they provide a adequate basis for estimating the likely costs of the outputs expected, although in areas where a top down methodology was applied for forecasting, these outputs are not well defined.

The overall scope and standard of the activity class setting process is not as high as we would expect or see in comparable processes in other sectors or contexts such as electricity transmission. However these forecasts represents a reasonable basis for the Ministry to inform it's advice on GPS24 given the late stage of the process.

02

The costs are biased toward underestimates and there are no 'quick wins' to reduce costs for GPS24

On balance, the costs appear underestimated based on analysis of inflators applied, inconsistent approach to escalation and likely optimism bias in estimates sourced from local government. We expect real output would most likely be lower than underpinned forecasts.

Nothing in the forecasts and supporting materials points to 'quick wins' at a macro level to immediately materially reduce costs whilst achieving the stable continuous programmes and delivering existing and probable commitments. However, our ability to assess this was limited by the absence of consideration of opportunities for efficiency gains as part of the process. We expect such opportunities do exist.

03

The level of real investment proposed in the forecast does not present high delivery risk

The level of forecasted expenditure ($17.8 billion) represents decreasing real activity compared to the 2021-24 NLTP period. Outside the NLTP, demand has been broadly stable with a potential real decrease in expenditure over the 2024-27 period (dependent on project timing). While the market would struggle with a sharp increase over the 24-27 period, it should meet stable NLTP demand. While local governments face continued financial and internal capacity pressures, this does not appear to represent a significant risk to the delivery of the NLTP at current forecasted levels.

It does not appear that substantive market capacity assessment was undertaken prior to our review.

Executive Summary (2 of 2)

Medium-term : There is substantial room to improve the activity class setting process and investigate efficiencies, which should be advanced prior to development of the next GPS

04

Future forecasts would benefit from improved practice with purpose-built models and clear expectations

In general the forecasts rely on pre-existing estimates repurposed for use in the GPS forecasting. In some cases core good practice, such as embedding assumptions and evidence underpinning model methodology and inputs is lacking. Forecast confidence could also be improved by greater use of bottom-up forecasting of continuous programmes.

We recommend that prior to the development of GPS27, Waka Kotahi and the Ministry (including senior management) work together to define the role of the forecasts and quality standards necessary to fulfill that role. Factors not considered as part of the process year such as opportunities for efficiency gain and sector impact should also feature.

05

The current process doesn't necessarily allow for price-quality trade-offs; but it should

More fundamentally, the approach to forecasting does not offer the Ministry or the Minister with the information or analysis to accurately make meaningful price-quality trade-offs to inform the overall level of funding associated revenue. Being in a position to provide such analysis represents a very large change in focus and resourcing for this process compared to the status quo, but is an important compliment to ongoing work on transport funding.

Shifting to price-quality analysis is made more difficult by the current practice of issuing the GPS every three years and the complexities and changing priorities of the transport system, but even within these constraints, meaningful improvement should be achievable.

06

Beyond forecasting there are a number of areas that Waka Kotahi could investigate to find cost efficiencies

Overall we expect there is material scope for efficiencies in the medium-term and recommend Waka Kotahi and the Ministry work together to investigate them in time for the next GPS.

Providing additional certainty to the supply market would mitigate risks in terms of cost certainty and delay. By taking a longer term, whole of life view, efficiencies in cost certainty, productivity and speed of delivery may occur, but are likely to require changes to procurement and investment practice.

Further areas, such as implementation of the Integrated Delivery Model, updated traffic management guidance and review of key result areas (KRAs) should also be considered.

Background and scope (1 of 3)

Background

The Government Policy Statement on Land Transport ("**GPS**"), through the setting of funding ranges for the National Land Transport Programme ("**NLTP**") is the Government mechanism for setting spending (and effectively revenue) levels for core land transport infrastructure investment.

It is the role of the Ministry of Transport (the "**Ministry**") to produce a draft GPS and to advise the Minister of Transport on the setting of funding ranges and associated revenue requirements. To inform advice on funding ranges, the Ministry relies to a substantial part of forecasts (generated primarily by Waka Kotahi) on the levels of expenditure required for the NLTP. These are guided by the Minister's strategic direction and the range of funding expected to be realistically available.

During the preparation of forecasts to inform GPS24, substantial regard has been given to the Minister's prioritisation of maintenance and renewals, as well as public transport and road safety, over local road and state highway improvements. It was also clear that large revenue increases were not desired. Given the current inflationary environment, this has led to forecasts being based on maintaining continuous programmes and limiting improvements to existing or 'probable' commitments (those expected to be made during the current NLTP period). Th is has been framed as 'essential expenditure' and does not include any new activities for inclusion in NLTP 2024-27.

Scope

To inform the setting of updated GPS24 funding ranges, the Ministry engaged KPMG (supported by Mott MacDonald providing a technical transport sector perspective) to undertake a rapid review of the forecasts and supporting evidence, as well as gather wider system evidence and provide advice on:

1. The level of confidence in specific activity class forecasts and, to the extent possible, benchmarking (Section 1).
2. Risks to delivery at the forecast NLTP levels in terms of the supplier market and local government (Section 2).
3. The appropriateness of the Ministry's draft funding ranges and any potential opportunities for efficiency or savings in the 2024-27 period (Section 3).

The Ministry also requested that KPMG's advice include any wider observations on the forecasting process in general that might inform the approach for preparing future GPS's and opportunities for changes that could provide medium-term efficiencies.

The Ministry instructed KPMG to primarily focus on activity classes funded by the National Land Transport Fund (rather than the Crown) and in particular, the larger activity classes. Therefore, the review focused primarily on the continuous programmes and improvements, with a bias towards the largest (in dollar terms) activity classes within them.

The intended purpose of this report is to compliment the Ministry's own analysis when forming its advice to the Minister of Transport on the draft GPS, and in particular, the funding ranges and associated revenue required.

Background and scope (2 of 3)

Approach

The foundation of our approach has been a review of the models that have been used to estimate requirements for the 2024-27 NLTP (in particular 'model v6.7.'). This has involved reviewing the mechanics of the models and working with Waka Kotahi and the Ministry to understand the evidence underpinning them and the reasons for the particular modelling approaches taken.

We have used this information to assess the confidence that can be applied to the forecasts and benchmarked (where possible) to calibrate overall bias in the forecasts and identify the actual outputs expected to be associated with the specific levels of investment.

This has been complimented with a desktop review of wider evidence related to the market and local government financial capacity. For several areas of inquiry, particularly with respect to the assessment of delivery risks, formal evidence is limited. To address this, we have undertaken a limited number of interviews with market participants and sector observers. We have also had the benefit of discussing these issues with several Waka Kotahi staff.

More detailed description of our approach is provided with respect to Section 1 (Cost Estimate Review) and Section 2 (Delivery Risk Assessment).

As this report is primarily for use by Ministry officials with substantial working familiarity with the land transport investment system, general knowledge of key concepts and terms is assumed.

Information limitations

As recognised by the Ministry, the review process has operated under compressed timeframes, with approximately six weeks available from establishment. This working draft report was provided following approximately 4.5 weeks.

Much of this time was needed for information gathering due to the review not being a planned feature of the process, and only partial supporting information having been provided to the Ministry prior to the review process. As the forecasts draw in various ways on a wide range of Waka Kotahi information, we can not be certain that we have reviewed all underpinning materials, notwithstanding the best efforts of those at Waka Kotahi to support this work which we recognise and appreciate.

Similarly, given the breadth of issues that relate directly or indirectly to the setting of funding ranges in the GPS, only a partial exploration of additional relevant evidence has been possible and there may be relevant considerations not incorporated.

Notably there has not been an opportunity to directly engage local authorities in the development or review of the report, notwithstanding the significant role those authorities have in the land transport funding.

Background and scope (3 of 3)

Clarifications

The GPS is typically updated every three years and is subject to changing Government priorities. Over the past two GPS cycles, there has been a significant pivot in government priorities for transport. These priorities call for greater investment to reduce emissions, build resilience to climate change, provide better options for public transport and active modes, and reduce death and serious injuries on our roads, in addition to maintaining and operating the system.

This creates inherent challenges for the Ministry and Waka Kotahi in forecasting and providing advice particularly related to improvements and other capital programmes (continuous programmes including maintenance are significantly less affected) and we have sought to be mindful of this context in our analysis.

This review was focused on the forecasts to inform GPS funding ranges. The analysis and findings should not be interpreted as relating to other Ministry or Waka Kotahi activities, including forecasting practices for internal use which we have not reviewed. Where we refer to information or analysis that was or was not applied, this is only in reference to whether such information or analysis was applied to the NLTP forecasting process to inform funding ranges. This limitation extends to the process observations in Section 3 (Conclusions and observations), which should be interpreted only as relating the process by which forecasts are prepared and provided to inform GPS funding ranges and associated revenue.

This report should not be taken as an assessment of the necessary or optimal level of expenditure through the National Land Transport Programme. The forecasts underpinning this report were based on a conception of 'essential investment' (largely maintaining continuous programmes at current performance levels and funding capital improvements already approved, or expected to be approved during the current NLTP period). We have taken this judgement as a given, and assessed forecasts and delivery risks on that basis.

We have not considered whether this is an appropriate definition of 'essential.' For example, we have not tested to what extend it is essential for Waka Kotahi to continue to make funding approvals for improvements between now and 30 June 2024. We have also not considered whether a focus on essential expenditure is the optimal approach or whether greater or lesser funding would lead to a better price-quality trade off or the implications for the land transport system of these choices.

In general, we do not consider the information provided sufficient make such judgements. We have indicated the need for both the Ministry and Waka Kotahi to work together to improve the quality and extent of forecasting information (and to ensure necessary trade off analysis to be undertaken) and have identified possible opportunities that should be examined to generate efficiencies in the medium to long term across both the NLTP and wider delivery programme (Section 3).

Contents

01

Cost estimate review

Overview (1/3)

Introduction

The focus of this section is to provide observations and findings following a review of the forecasted expenditure provided by Waka Kotahi (WK) for the NLTP 2024 - 27. The forecast expenditure that has represented the 'base case' and primarily informed advice on activity class ranges, for the period is $17.8bn, this is comprised of 13 activity classes across continuous programmes, committed activity expenditure and projects approved in 2021 – 24[1].

The aim of this review was to ascertain a level of confidence in the credibility and robustness of cost estimates across the activity classes. A secondary focus of the review was to highlight where possible, areas for potential cost savings.

Approach

A high-level programme was developed outlining key activities and the sequence of tasks required to enable the review. This broadly covered the following:

Initiation including data requests, enquiry and identification of key stakeholders for interview.

Discovery and Analysis reviewing activity class cost forecast methodology, establishing maturity criteria and enquiry workshops with stakeholders within WK.

Observations and findings compiling the findings of our review into the final draft report.

Although this approach has been widely adopted, several factors have limited the level of analysis which could be conducted during the discovery phase to ascertain credibility and robustness. This included; information limitations, driven primarily by the rapid review timescales, as well as restricted access to detailed project cost breakdowns for certain activity classes.

The cost estimate analysis was undertaken through two lenses, a bottom-up and top-down view. This included a desktop-based maturity assessment by drilling into the forecast models and supporting evidence.

Confidence Levels

We have assigned a level of confidence to each activity class based on the evidence obtained.

The three-point scale used is as follows:

Low to Moderate Confidence: Limited evidence to support the estimate, which results in a degree of uncertainty in the forecast cost.

Moderate: Partial evidence provided to support some but not all aspects of the estimated cost forecast, resulting in a moderate degree of uncertainty.

High Confidence: Well documented basis of estimates provided as evidence to support all aspects of the cost estimate, which leaves very little uncertainty in how the forecast has been determined.

It should be noted that the application of these confidence levels is based solely on the evidence and information obtained throughout the period of discovery. It does not take into consideration other artifacts or processes which have been mentioned but where supporting information has not yet been provided.

1. The $17.8bn is one of the forecasted scenarios, and it is noted that there is uncertainty about the likelihood of specific projects proceeding in the next NLTP. This uncertainty arises from changes in central and local policy, as well as wider investment decisions that affect funding availability.

Overview (2/3)

Structure of this section – continued

The cost estimate review findings have been structured around the activity class groupings outlined below.

	Activity Class	Forecast Spend 24-27 ($m)	Percentage of Spend
Continuous Programme	State Highway Maintenance	$3,582	20.2%
	Local Road Maintenance	$2,982	16.8%
	Public Transport Services (NZTA Share)	$2,271	12.8%
	Debt	$1,483	8.3%
	Investment Management	$205	1.2%
Improvements	Road to Zero[2]	$2,880	16.2%
	Public Transport Infrastructure	$1,845	10.4%
	State Highway Improvements	$1,016	5.7%
	Local Road Improvements	$558	3.1%
	Walking and Cycling	$508	2.9%
MoT Inclusions	Coastal Shipping	$30	0.2%
	Inter-Regional Public Transport	$45	0.2%
	Rail Network	$360	2.0%
	Total	**$17,765**	**100%**

2. A substantial portion ($1,850m) of the Road to Zero activity class could be considered as 'continuous programmes', such as road policing, road safety and promotion.

Continuous Programmes

Continuous long-term investments provide stable and predictable funding for projects that deliver ongoing benefits over time. This includes road maintenance, road policing and public transport operations. The forecast spend for the 2024-27 period is $10.9bn.

Throughout our enquiry it was identified that an iterative methodology has been adopted for forecasting these activity class costs.

1. The starting point which is captured within Waka Kotahi's Model 6.7 involved extracting prior year costs from Transport Investment Online (TIO), Waka Kotahi's financial management tool. This value has then been adjusted through application of indexation and other parameter adjustments. For more information on adjustments refer to the Appendicies.
2. These values were then reviewed in consultation with MoT and the activity class management teams and a revised forecast was outlined in March 2023.

As a result of this evolution, and having not been part of the original process there have been limitations on the ability to follow the final forecast back to the estimates which make up the prior year costing. This is further outlined within the respective activity class reviews.

When analysing the forecast, the cost estimate has been broken down into three components: prior year amounts, output adjustment, and price adjustment (this is considered on a per-annum basis).

- Prior year forecasted amounts refer to the 2021 – 24 continuous programme approved by the Board (at the time of NLTP 2021 adoption).
- Output adjustment refers to the extent to which the movement is affected by changes in output levels, such as changes in demand.
- Price adjustment refers to the extent to which the movement is affected by changes in prices, such as changes in Consumer Price Index (CPI).

Overview (3 /3)

Improvements

Activity classes within the improvements category relate to projects which are designed to improve an asset and increase the level of service for users, this includes road improvements, investments in public transport infrastructure and walking and cycling access. The forecast spend for this category in the 2024 – 27 period is $6.8bn, a significant portion of which is allocated to Road to Zero initiatives.

In a similar way to the continuous programmes, the forecast costs have evolved over the months leading up to this review. From a baseline position in model 6.7, further refinements were made in consultation with the activity class management teams. Given the short timeframe to undertake this review, rather than undertaking detailed gap analysis the primary focus has been on understanding what sits behind the current forecasts.

Through our enquiry and workshops with key Waka Kotahi stakeholders, we have identified that the scope covered by the improvement class forecasts broadly consists of the following key areas:

- Approved works (forecast of carry forward commitments from 2021 – 24, existing commitments)
- Forecasted approvals (impact of 2024 – 27 if all remaining 21 – 24 probables become committed)
- Forecast continuous programmes within improvements (e.g. bus stops)

Given anticipated revenue limitations the modelling has largely assumed no new commitments for improvements during the 2024-27 NLTP period.

The costings associated with each of these areas have been forecast using data within TIO. In contrast to the continuous programme, the improvement activities forecast consists of identifiable projects which are at various stages of the project lifecycle; business case, procurement and others that are in delivery.

To enable us to gain a level of confidence in the forecast and how they have been determined, a sample of projects was identified, and a request for financial reporting, cost estimates, and/or business cases (where available) to support the forecast was issued.

The maturity of the cost estimates and associated forecasts vary depending upon the phase of the lifecycle that the project is in. Probable project estimates vary from highly indicative top-down estimates by a Council with limited supporting documentation to business case cost estimates developed in accordance with Waka Kotahi's cost estimation manual (SM014).

MOT Inclusions

Three activity classes were derived by the Ministry and we were advised that these values were determined as follows:

Rail - Waka Kotahi did not provide any estimates for the Rail Activity Class within Model 6.7 or other forecasts. The $360m (or $120m per year) is carry over of the lower funding range from GPS 21.

Coastal Shipping and Inter-regional rail – Included at the request of the Minister, The draft GPS document outlines their intent and purpose.

Investment Management – Included by MoT as the lower bound activity class amount.

Since the costs associated with these activity classes are relatively small, KPMG and Mott MacDonald have not prioritised the review of them in line with guidance from the Ministry.

Detailed analysis

The section is underpinned by analysis undertaken on each of the key activity classes and on key adjustments and indices applied. This analysis is presented in the Appendices. Key observations are summarised in the subsequent slides. Please note that there are some information limitations in the appendices due to Waka Kotahi being unable to provide the information in the time available.

Forecasting process - key features and insights (1 of 2)

Cost estimate processes – continuous programmes and improvements

Through our enquiry, it is clear that WK's internal budget processes are being used to inform the forecasted amounts. For key activity classes both bottom-up and top-down cost estimate processes are being used in TIO.

However, it is noted that there is a sense of conservatism when these estimates are developed to allow for inflationary trends, and the approach taken to update cost estimates is not necessarily consistent across the portfolio of projects identified in the NLTP. This creates a potential for optimism bias, which may result in underestimated cost forecasts.

Top-down cost estimation is undertaken by experienced personnel within WK that consider project budget considerations, forecasting and review the robustness of their development including provision for cost escalation and risk allocation.

These reviews are "sample based" across the NLTP portfolio given the quantum of projects that would need to be reviewed to achieve a 100% review rate.

This quality assurance provides WK with an increased level of confidence to account for regional trends, material supply peaks and troughs and any external factors like competing sector planning and delivery that may impact on the programme.

Bottom-up cost estimation utilises the SM014 Cost Estimation manual requirements, and it is evident that this is generally being followed. Project assumptions are relatively well documented to inform individual cost items across the activity classes within the forecasts.

However, In some cases, inadequate consideration of factors such as cost escalations, contingency planning, and risk allocation has resulted in significant adjustments being required in order to account for these omissions in the current NLTP figures.

Estimate sampling

As indicated within the overview section we have had to adjust our approach throughout this review due to information limitations, driven primarily by the rapid review timescales. However, it also became apparent that supporting information and project artifacts (business cases / cost reporting etc.) which underpinned the forecast were not readily available, or in a form which enabled efficient review or assurance to be undertaken by an external party. This is due to manual and timely extraction process required by users from the TIO system which holds the data.

However, we were able to obtain a sample of 5 project artifacts for the key activity classes as outlined within the basis of findings section.

Benchmarking

To provide further confidence to the estimated costings it is understood that benchmarking is undertaken by Waka Kotahi commercial team for comparative analysis (however this has not been seen as part of this review and therefore we cannot describe the process followed). Where necessary forecasts are adjusted to account for the changing economic environment. This includes referencing public documents e.g. research undertaken by the Infrastructure Commission. It was also noted that a large local government follows a similar approach to review, assess and update their forecasts.

While benchmarking provides a level of confidence that the right budget has been developed the data and context of what is being compared must be fully understood to ensure comparisons are like for like. Further, benchmarking does not guarantee that Contractors in the current market will price their tender submission in line with past projects which make up the benchmark sample.

Insight *Mott MacDonald recently undertook a civil construction tender evaluation for a private developer (complying to Waka Kotahi standards), four suppliers submitted tender returns, two submitted similar low prices and two submitted similar higher prices, with a significant range between the prices. Although not unusual, it is not always apparent how Contractors have priced their work or factored in risk as Contractors may include costs in different areas that reflect the current operating environment. Some may factor in variations due to how the scope has been defined, or may have underestimated the complexity of the work. By increasing contractors certainty and confidence in procurement processes they will incorporate less risk in their pricing, or have less ability to seek variations through the construction period. In this case the parallel cost estimate was within 5% of the lowest price.*

Forecasting process key features and insights (2 of 2)

Estimate Assurance Process

Transport Investment Online (TIO) is WK system used to capture and manage all activities for inclusion in the National Land Transport Programme (NLTP). This stores project artifacts, including both quantitative and qualitative documentation, which were sighted through the process by way of screen sharing with stakeholders and snips shared via correspondence.

The platform is updated when the approval amount changes. This ensures that projects contain the most up-to-date approval amount as they progress through the phases of the lifecycle. However, it appears that the level of evidence supporting these amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi estimation manual, business cases with non-formal peer review, or costs provided by Councils without a detailed, cost estimate available. Consequently, the level of certainty and confidence can vary. Further checks and balances should be in place to ensure the assessments are in line with SM014.

Investment Quality Assurance processes provide assurance that the correct information is being uploaded but it is not clear how or when those budgets had been updated with documented evidence on the change. This is an area that could be improved through improved visibility, standardised processes and removal of the manual process between functions. Information entered into TIO would provide greater value if the information was date and time stamped.

Cost estimates – Suppliers perspectives

Through consultation with the supply chain partners, there are indications that funding availability (which is underpinned by estimates) is often a constraint to delivering quality long term outcomes. Whole of life (Totex) considerations are limited due to the short term funding availability. Delivering broader outcomes is a growing priority however the costs associated with delivering these outcomes is, at times overlooked..

Although suppliers regularly look to achieve high levels of service (and this is evident through high rating results of performance measures like KRA's/KPI's) they observed that insufficient funding has led to poor asset management outcomes, resulting in long-term legacy issues that will take years to recover from as best practice is difficult to achieve.

Continuous Programmes – Road Maintenance – Suppliers perspectives

State highway and local road maintenance collectively make up 37% of the forecast cost, and is the source of most of the increase in forecast spend over the current period. It was therefore a significant focus of our analysis and engagement with suppliers.

Maintenance is delivered primarily through the Network Outcome Contracts (NOCs). Performance of the NOC Contracts appeared to be relatively good on balance with some performing well whilst others indicated room for improvement. It was noted that the core renewals element within the NOCs is Lump Sum and the opportunity to renegotiate was limited as material costs significantly outstripped escalation adjustments.

It was noted that there is an indexation uplift provision within Waka Kotahi's forecast to account for inflation however this was significantly short of the 30% increase in cost indices over the last two years as indicated through the NZ Stats Producer Price Index. This should be reviewed annually inline with market conditions.

It is also understood that the Safety Improvement Programme scope was removed from the NOCs which has resulted in lower margins, making the NOCs less commercially attractive to the supply chain partners. As a result, our market sounding has indicated that Contractors are now targeting reactive opportunities like weather events to improve commercial performance which is not necessarily good practice.

Further challenges were highlighted from the increased regulation and safety awareness which has directly increased the cost to suppliers to deliver works. This has resulted in significant increases, for example, in Traffic Management requirements under the Health and Safety at Work Act 2015 and associated costs that exceeded the works being undertaken. With a capped level of funding and an increased spend in this area, this has reduced the funding available to deliver resurfacing and in turn reduced activity.

Suppliers consider that due to maintenance budgets they consider insufficient to provide high quality road networks, that there are long term legacy issues of deterioration of the network that will take decades to recover from. There is some evidence to support this such as a Waka Kotahi pavement condition reporting showing rutting trends increasing, but validating this view is outside the scope of this report. This is despite NOC's achieving KRA's/KPI's (possibly as these are largely linked to budget spend rather than long term outcomes). Waka Kotahi have responded to the opportunity to improve through the implementation of the Integrated Delivery Model recently being consulted on with the industry.

Benchmarking

Overview

To undertake meaningful benchmarking, relevant and comparable projects are required, and cost data must be normalised prior to analysis. The task of benchmarking presented challenges due to the limited cost estimate detail and supporting context around the scope of works, delivery model and construction methodology, and as a result, our analysis focused on determining whether the forecasted costs lean towards underestimations or overestimations.

Analysis

The underestimation of costing is primarily attributed to the following factors:

1. Cost escalation in the construction sector: Inflation indices applied assume a significant reduction in inflation compared to recent levels. While this may be a reasonable assumption based on market forecasts we see the balance of risk weighted towards sector inflation remaining higher than indices applied. This is particularly relevant given the reported under investment in the network, which will likely result in increased long term maintenance costs leading to the need for higher inflators. A suitable stress test for the inflators will be determined by how quickly the CPI drops back to a stable figure.
2. Inconsistent application of escalation: We identified that while as a principle, escalation was applied to projects with costs based on less recent estimates, this was inconsistent and some projects underpinning estimates were not inflated.
3. Uncertainty in Council-forecasted costs: While Waka Kotahi's cost estimation methodologies are robust and appear consistently applied, a number of costs are based on local government estimates which from limited information obtained, appear less consistent and can contain optimism bias.
4. Delays and Disruptions: Delays caused by events like Covid shutdowns, Cyclone Gabrielle, and ongoing labour shortages have a material impact on the timing and completion of projects. These delays are likely to be more significant than in previous NLTP periods.
    a. For improvement activities, Waka Kotahi's analysis of historical data indicates an approximate 15% delay in spend compared to approved cash flow. However, considering the significant disruptions experienced during the 21-24 NLTP period, they anticipate a higher rate of delay of at least 25%. This increased delay includes the impact of cost escalation, meaning the actual amount of delivery and associated spending delayed from 21-24 into 24-27 may be higher. Therefore, a reasonable range for improvement activities could be considered as 15-25% for delays.

	Activity Class	Forecast Spend 24-27 ($m)	Under or over estimation?
Continuous Programme	State Highway Maintenance	$3,582	Likely under estimated
	Local Road Maintenance	$2,982	
	Public Transport Services (NZTA Share)	$2,271	
	Debt	$1,483	Not assessed
	Investment Management	$205	Not assessed
Improvements	Road to Zero	$2,880	Lilkely under estimated
	Public Transport Infrastructure	$1,845	
	State Highway Improvements	$1,016	
	Local Road Improvements	$558	
	Walking and Cycling	$508	
MoT Inclusions	Coastal Shipping	$30	Not assessed
	Inter-Regional Public Transport	$45	Not assessed
	Rail Network	$360	Not assessed

Cost Review Conclusions

We consider the estimates provide moderate confidence and are an adequate basis for informing immediate decisions around GPS24

Overall, and as provided in detail in Appendix A we have assessed the forecasts as providing moderate confidence. While our assessment did conclude that a number of components warranted only low to moderate confidence these were largely less financially material areas, whereas the areas guiding larger spending were generally assessed as moderate confidence. In general, overall confidence was strengthened by:

- the generally sound approach to top-down estimation of continuous programme grounded in good understanding of recent and historic trends
- Of the sample reviewed the improvement estimates were based on Waka Kotahi bottom-up costings applying consistent costing methodologies in line with their estimating manual

Confidence is weakened by:

- a degree of inherent uncertainty, particularly with respect to inflation as well as less consistent bottom-up costs from local government
- the absence of clear standards and expectations of forecasting for GPS activity class setting
- less use of rolling bottom-up forecasting on continuous programmes with indexation applied progressively on a first principles (Labour, Plant, Materials) review basis.

The estimates are more likely to be biased to be under the actual cost than over

Although inherently uncertain, we consider that on balance, the forecasts are more likely to be biased towards underestimating the actual cost of delivering the proposed programme rather than overestimating. This is largely based on cost inflation indices considered to be reasonable, but conservative and incomplete application of escalation to improvements. Additional factors are likely conservative cost estimations from local government and historical experience. The main potential for cost estimates to be over actual costs is for sector inflation factors to be materially below forecasts, which is possible, but unlikely.

There are no ‘quick wins’ to reducing costs without trading off output levels for the purpose of setting GPS24 funding ranges

Based on our assessment of the reasonableness of the cost estimates and their bias towards underestimation, we have been unable to identify any material short-term cost savings that could be achieved without reducing expected outputs at this macro level.

As discussed further below, we consider that (excluding public transport services) the proposed level of investment is likely to represent flat or declining real output compared to the 2021-24 NLTP period. Any reductions in investment from the proposed level can be expected to further reduce that output.

Based on the evidence at the time available, we are unable to comment on the service level or whole-of-life cost impacts of any such reduction in output.

There remains substantial room to improve forecast quality in the future

The forecasts are sufficient to inform immediate decisions given the late stage of the GPS development process. Nevertheless, the standard and practice for the forecasts is not as high as we would expect for a process of this significance, or in comparison with some other network infrastructure providers. This is discussed further in Section 3, notable observations include:

- A reliance on using estimates created for other purposes to inform the GPS process rather than creating fit-for-purpose models
- A general absence of documentation within the models explaining the assumptions and evidence sitting behind methodological choices and inputs
- Poor visibility to expected real outputs from continuous programmes and of expected service level impacts of investment
- Apparent absence of consideration on market capacity and development from different funding levels or associated opportunity for investment.

02

Delivery risk assessment

Overview (1 of 2)

Introduction

The focus of this section is to place the proposed investment in GPS24 within the context of the wider infrastructure sector and economy. In particular, this broader view is intended to identify key constraints, risks and challenges that could impact the deliverability of the spend across the activity classes. In this section, we have undertaken a high-level review to primarily consider:

- General capacity and capability within the supplier market, and its ability to respond to changes in demand.
- The future pipeline of infrastructure projects outside of the GPS and the extent to which these may impact deliverability during the 24-27 period.
- Financial and delivery constraints within local government.

High-level approach

Given the compressed time to undertake this review, we have primarily relied on existing sources of evidence to consider the above issues. In general, we would observe that views on the future direction of the market tend to be anecdotal, rather than from existing definitive measures, datasets or consolidated evidence. Broadly, we have sought evidence from the following sources:

- Desktop research from both central government (e.g. MBIE, Te Waihanga, Stats NZ) and industry sources (e.g. publicly available market surveys).
- Existing consolidated material from Waka Kotahi, including historic delivery levels.
- Informal market sounding with market participants and relevant government agencies.

Given time constraints we have not engaged directly with local government during this process.

Structure of this section

This section is structured in the following four parts. The evidence across each of these culminates in an assessment against the risk rating framework set out on the following page.

Change in real activity proposed

This part considers the extent to which there is an increase in real activity proposed to be funded in NLTP24-27 relative to NLTP21-24. Where possible, we have sought to consider any change in complexity in the delivery proposed, but is primarily focused on disaggregating price (not expected to require additional market capacity) and genuine output increases.

Assessment of market capacity

This part is divided into:

1. A review of current delivery performance focusing on the extent to which the existing planned NLTP21-24 has been delivered utilising available performance measures.
2. NZ infrastructure sector snapshot and future project pipeline, including the extent to which broader pressures may indicate that status quo (or near to) delivery rates would no longer be sustainable in the coming GPS period.
3. Key themes from our high-level market engagement as part of this work.

Assessment of Council capacity

This part focuses on the evidence on Council delivery capacity given previous expenditure in NTLTP21-24 and broader capability issues within local authorities.

Conclusions on delivery risks

A summary assessment of the above evidence against the analytical framework set out on the following page.

Overview (2 of 2)

Our primary analytical question for assessing the market's ability to deliver the proposed NLTP 24-27 program was:

If the NLTP 24-27 program as forecast by Waka Kotahi was funded, would the market and local government (where relevant) be able to deliver on that investment, and what, if any, would the flow on impacts of that be?

Change in real output proposed \ Market capacity	Market is failing to provide sufficient capacity to deliver NLTP21-24 and broader environment is stable or worsening.	Market is largely succeeding at providing capacity to deliver NLTP21-24, but with heightened inflation and delays and broader environment is stable or worsening.	Market is largely succeeding at providing capacity to deliver NLTP21-24, and broader environment is stable or improving
NLTP24-27 forecast and wider transport spend represents a material increase in real output compared to NLTP21-24	Very high risk	High risk	Medium risk
NLTP24-27 forecast and wider transport spend represents similar real output compared to NLTP21-24 but represents greater complexity to deliver	High risk	Medium risk	Low risk
NLTP24-27 forecast and wider transport spend represents similar or decreased real output and complexity compared to NLTP21-24	Medium risk	Low risk	Very low risk

Rating interpretation

Very high risk: Expected outcomes is that the market will not be able to deliver the forecast programme.

High risk: There is a material chance of the market not being able to deliver the forecast programme. If it is delivered, it is expected there will be flow on impacts in terms of sector inflation and crowding out activity elsewhere.

Medium risk: It is possible but unlikely that the market will not be able to deliver on the programme. There is a material chance of flow on impacts.

Low risk: It is expected that the market will be able to deliver on the programme. It is possible there will be flow on impacts.

Very low risk: It is expected that the market will be able to deliver on the programme without flow on impacts.

Change in transport investment (1 of 2)

Overview

As part of considering the impact of the draft NLTP24-27, we have sought to determine the extent to which the increase in proposed spend in key activity classes is primarily driven by price inflation compared to changes in real activity as this speaks directly to delivery risks.

Table: Summary of expenditure change

	Activity Class	NLTP21 ($m)	NLTP24 ($m)	% change
Continuous Programme	State Highway Maintenance	2,845	3,946	28%
	Local Road Maintenance	2,416	2,965	19%
	Public Transport Services (NZTA Share)	1,459	2,271	36%
Improvements	Road to Zero	2,606	2,796	7%
	Public Transport Infrastructure	1,509	1,846	18%
	State Highway Improvements	2,875	1,017	-183%
	Local Road Improvements	489	558	12%
	Walking and Cycling	578	529	-9%
	Total	**$14,777**	**$15,928**	**7%**

Our analysis has been primarily focused on continuous programmes. In particular, we have sought to disaggregate the indexation factors included in Waka Kotahi's modelling between price and output. While the modelling is based on a 'maintain current levels of service' approach, the modelling does make adjustments for additional roads and wear through vehicle kilometres, while the remaining adjustments are primarily focused on expected cost increases to maintain the status quo (although we note that this is a somewhat imperfect split given the data available).

Diagram: State Highway and Local Road maintenance uplift price / output % split

For improvement programmes, the underlying data does not allow similar analysis given that it consists of individual projects that differ across the two NLTP periods. We would however note that the current proposed NLTP24-27 range is for a significant decrease in nominal state highway improvement expenditure, and a 12% total increase for local road improvements. With sector inflation running approximately 25% over the first two years of the 2021-24 NLTP period, this would imply that forecast improvements expenditure would represent significant decreases in real activity.

Similarly, even based on conservative inflation assumptions the small nominal increase for continuous programmes and improvements in the forecast for 2024-27 over the 2021-24 proposed together likely represents a decrease in real output across the programmes.

Change in transport investment (2 of 2)

Major project overview and impact

Although we expect real output in NLTP to decease at forecast levels, there is significant non-NLTF funding transport activity.

The table to the right identifies the major transport projects currently underway or under consideration not expected to be funded by the NLTF and their expected impact on demand change over the 2024-27 period.

Major areas of expenditure such as NZUP are expected to continue at a comparable pace to the present. CRL and major COVID-19 era stimulus expenditure will continue but on a declining path. The ongoing iRex project and flood recovery, as well as potentially ALR will scale up over the 24-27 period.

The largest potential impacts (Waitemata Harbour Crossing, ALR, Auckland Airport, initial impacts of water reform investment, Christchurch and Wellington mass rapid transit) would largely sit outside the 24-27 period, but would suggest an unprecedented scale up of investment activity would be required for these to be achieved. We would see significant market capacity risk if these are to go ahead simultaneously, but we do not anticipate the majority of their demand impact to occur within the 2024-27 period.

Project Name	Location	Est. value	Status	Expected 24/27 demand impact
City Rail Link (CRL)	Auckland	~$1.5bn across 2024-26	Under Construction	**Med impact.** Some demand impact reducing in second half of period but continuation of current levels. Construction of the stations and supporting rail infrastructure expected to be completed by November 2025
Auckland Light Rail (ALR)	Auckland	$14bn	Detailed planning	**Uncertain.** Detailed business case to be delivered for investment decision in mid-2024. Main works commencing no earlier than 25/26. Unlikely to scale up prior to completion of CRL.
Waitemata Harbour crossing	Auckland	$15bn - $25bn	Detailed planning	**No impact.** Construction expected to commence in 2029.
Christchurch Rapid Transit	Christchurch	$1.8bn - $4.4bn	Early planning	**No impact.** An Indicative Business Case is currently under development, with subsequent planning and then consenting required once this is complete.
Wellington Mass Rapid Transit	Wellington	$6.4bn	Early planning	**No impact.** Detailed Business Case due in 2024. Indicative construction commencing in 2028.
iRex	Wellington / Picton	$1.5bn	Enabling construction works underway	**Demand impact.** Main construction works scheduled to start mid-2023 and to be completed by 2026.
'Shovel Ready' and Infrastructure Acceleration Fund	Nationwide	~$1-$2bn	Various stages of planning and delivery	**Low impact.** Spending will continue across the 2024-27 period and beyond but likely at a reduced pace to the 2021-24 period.
NZUP	Nationwide	~$2.3bn across 2024-27	Under construction	**Med impact**. Demand across the period at similar levels to 2021-24 period.
National Resilience Plan (transport component)	Nationwide, NZ	$1bn+	Various stages of planning and delivery	**Unclear but material**. Scale of transport component unclear (likely $1bn+) as is the geographic focus and timescale.
The Suburban Rail Loop (SRL)	Victoria, AUS	$125bn	Under delivery	**Med Impact.** Will likely have an impact on demand. Construction has commenced and will continue beyond 2035.
Sydney Metro Rail System (City, WSA and South West)	Sydney, AUS	$22.5bn – $23.5bn	Under Delivery	**Low impact.** Construction is underway and likely to be completed by mid-2026.

Construction and Infrastructure Markets (1 of 5)

Background

NZ construction sector activity across residential and non-residential was approximately $35bn by value in 2022. In addition, around ~$10bn can be attributed to infrastructure construction (non-building construction such as roads and civil works). In Q1 2022, New Zealand's construction industry employed approximately 11% of the total workforce.

Over the past two years, the construction sector in New Zealand has experienced significant growth and investment across both residential and non-residential building activity.

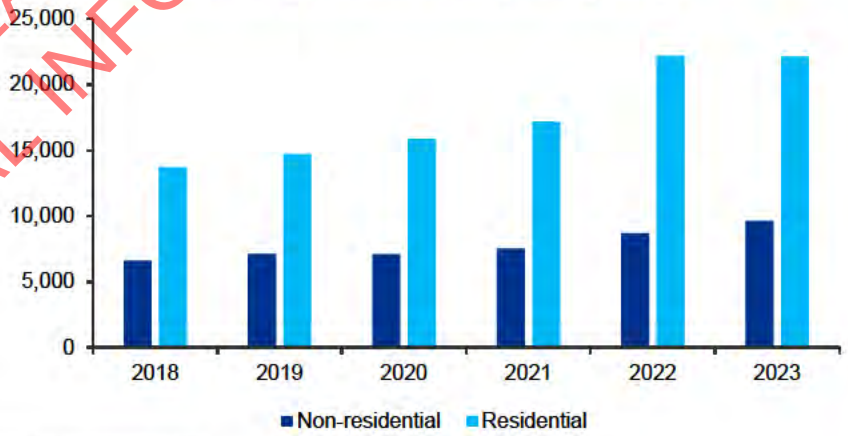
The recent history of the sector can be characterised by:

- significant increases in the number of new residential dwelling consents, as well as industrial, healthcare and education developments, driving construction activity.
- significant challenges due to supply chain issues and difficultly in finding staff relating to the impacts of COVID-19. This has led to record construction cost price inflation across both labour and materials.
- despite the above, the construction workforce has seen consistent growth, growing by 25% between 2018 to 2021. Growth is however projected by MBIE to stabilise over the 2022-2027 with total growth in the construction workforce forecast to be ~3%.
- capacity utilisation as reported by employers at historically high levels and a steep increase in online construction job advertisements.

Diagram: Annual residential and non-residential spend ($bn)

Diagram: Building consent issued per year

Total number of building consents issued (March yr end)



Sector at a glance

$76.9b

Total value of planned infrastructure projects in pipeline

295,300

Number of people employed in construction, as at June 2022

3%

Forecast construction market AAGR (Average Annual Growth rate) for the 2024-27 period

2,465

Number of infrastructure projects in the pipeline, with values ranging from $1m to $1bn+

Construction and Infrastructure Markets (2 of 5)

Future outlook

While currently strong, there is evidence that some of the pressure in the sector is starting to ease…

At the time of this report, the construction sector appears to remain near current capacity, but has suppliers within that can respond better than others. For example, while an imperfect measure, the RLB Crane Index reported a record 157 long-term cranes at key sites throughout New Zealand (a net increase of nine cranes on the prior year or 5.7%). However, there are indications that pressure in the sector may begin to ease:

- An expected reduction in residential building activity given ongoing reduction in house prices, partially driven by financial lending constraints. BRANZ forecasts a reduction in residential dwelling activity. This is reflected in the MBIE construction forecast for residential building activity reducing by around 20% over the next five years supported by decline in building consents currently underway.
- A recent Statistics NZ building activity report showed a reduction in the total volume of building activity of 1.6 percent in the December 2022 quarter. This drop in building volume is the first reduction since September 2021.
- A number of industry surveys (e.g. BDO, EBOSS supply chain survey) are indicating an easing of supply chain pressure and some softening of future pipeline of the firms surveyed.
- The quantity of ready-mixed concrete produced, a leading indicator of construction activity, is down 7.8% in seasonally adjusted terms in the six months to March 2023, although ConcreteNZ predicts demand to increase in 2023 and 2024.

…although price inflation remains at historically high levels…

- The Producers Price Index (PPI) (outputs) for Heavy and Civil Engineering Construction (EE12) and Construction Services (EE13) were cumulatively up 16.6% and 10.4% in the year to December 2022, near records.

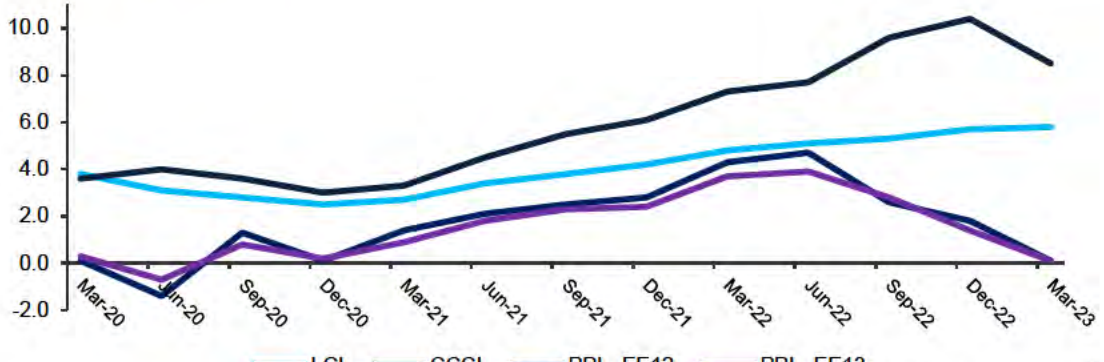
Inputs index changes are similar. The Labour Cost Index (LCI) for construction was up 4.2% similar in the year March 2023, and Cordell's Construction Cost Index (CCCI) reached a record high of 10.5% annual growth Q4 2022 albeit with a softening to 8.5% Q1 2023.

…and the sector continues to face longer term challenges that make growing capacity challenging

- Ongoing persistent skill shortages across all stages of infrastructure planning and delivery, including client and project leadership, engineering and technical professions. There is also a struggle to attract workers from the full breadth of the economy.
- Ongoing productivity challenges relative to the wider economy. Research by Te Waihanga found that, between 2000 to 2020, labour productivity grew by 23%, 25% and 5% across building, construction services and heavy/civil construction, respectively. This compares to 30% economy wide. Te Waihanga suggest the slow growth in heavy/civil construction may be due to less competition and inefficient consenting processes.

Diagram: Trends in construction sector cost indices

Annual percentage change from same quarter in prior year in key cost inflators (%)



Construction and Infrastructure Markets (3 of 5)

New Zealand infrastructure pipeline

Te Waihanga estimates the value of the National Infrastructure Pipeline to be $76.9 billion (as at November 2022). The development of the pipeline resulted from recommendations of the Construction Sector Accord for a more visible coordinated pipeline of future work. Projects without sufficient certainty of timing are not included, nor are ICT-related infrastructure projects. Based on the latest update to the pipeline in November 2022:

- In total, infrastructure spend in 2022 was forecast to be $11.6bn, with this expected to increase to $12.9bn in 2023 (the peak year in the current forecast). Within Te Waihanga's Infrastructure pipeline, there are 3,085 projects recorded at varying stages of planning and construction. Of this, there are 15 projects with a forecast cost range of $500m to $1bn and seven projects with forecast cost of $1bn+.

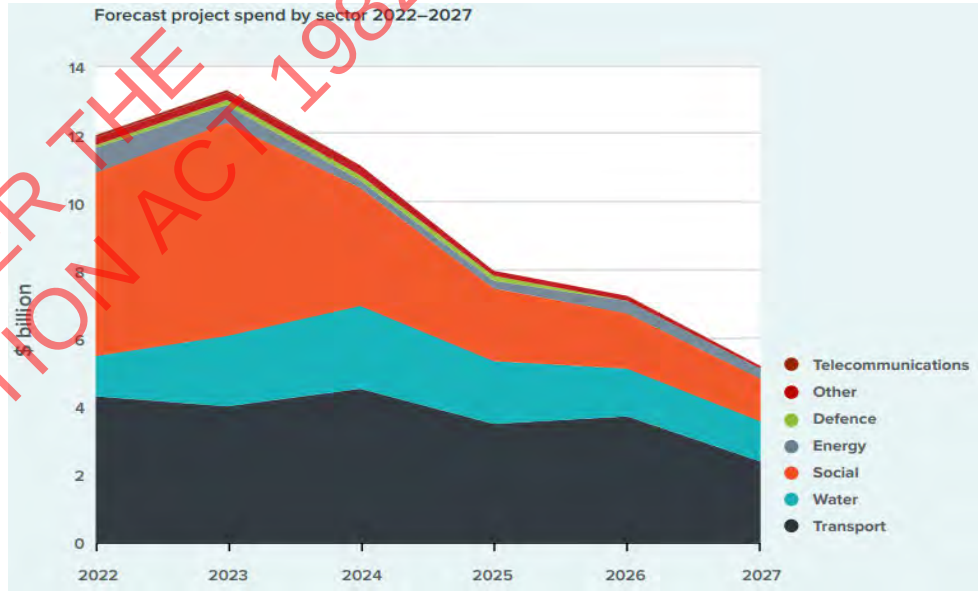
- The social sector represents investment across social housing (37%), education (23%), health infrastructure (20%), and community facilities (19%). In 2023, this investment will account for $6.1 billion or 47% of total forecast spend in 2023. From 2024, this proportion is anticipated to reduce significantly over time.

- Unlike the social sector, investment across other sectors is forecast to be more stable. Forecasted transport project spend is projected to account for $3.9 billion or 30% of the total infrastructure forecast spend in 2023. By 2026, forecast transport spend is forecast to represent half (51%) of total spending across all sectors.

Commentary

We note that the pipeline data is somewhat limited in its ability to provide a forecast of likely infrastructure spend beyond the next 1-2 years, and we expect that the apparent decline is substantially an artifact of funding approval processes with unfunded potential projects typically yet to be in the pipeline.

Diagram: Infrastructure pipeline



Source: NZ infrastructure sector pipeline report, November 2022

Key observations

- While relatively limited in nature, the pipeline is the most comprehensive data source available on future infrastructure spend across all sectors. It does however miss key projects with uncertain delivery timeframes, and as such, these are discussed further on the following page.
- We do however note that the pipeline does not show a significant increase in spend in the next NLTP period. While this on its own is not sufficient to conclude that market capacity will increase, the opposite result (i.e. an increasing forecast pipeline of projects) would have indicated likely significant market capacity constraints in that period.

Construction and Infrastructure Markets (4 of 5)

Broader future infrastructure pipeline

The adjacent table provides details on the broader, but less certain non-transport NZ infrastructure pipeline.

Australian pipeline

Strategic investment decisions made in Australia are anticipated to impact on New Zealand sector capacity. Recent decisions by the Australian Labour Government to reprioritise and take projects off the book have potential to add softness to market. Many decisions are still pending as their Government undertakes a 90 day review with a view to focus on reconciling the pipeline to projects that improve long-term productivity, supply chains and economic growth. However, on 17 May it was announced that the $13 billion Melbourne Airport Link construction would be paused with workers redeployed.

Budget 2023 impacts

The Government Infrastructure Investment Funding has increased over the past 3 years. This year it was announced $62.7bn will be allocated to infrastructure investment over the next five years. In comparison to 2022 and 2021 having an estimated infrastructure spend of $61.9bn and $57bn, respectively representing a modest decline in real terms.

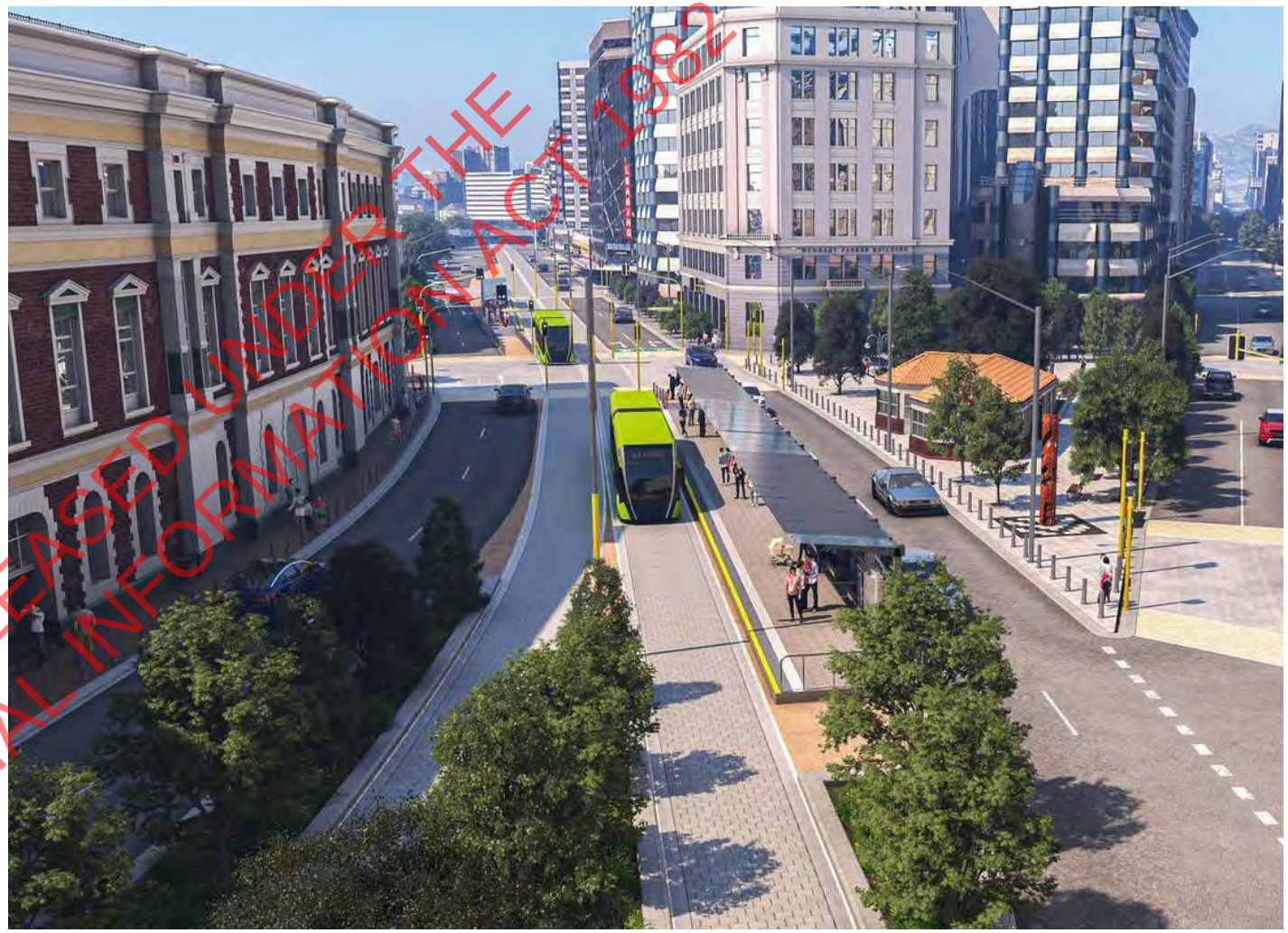
Budget 23 announced additional spend of $6bn as part of the National Resilience Plan and $1bn for Flood Recovery. Combined, indicative growth of the five year allocation to infrastructure grew 25% on 2021.

Project Name	Region	Est. value	Status	Expected 24-27 demand impact
Lake Onslow (NZ Battery project)	Otago	$15.7bn	Pre-DBC	**Nil – Low.** Project remains highly uncertain, with investment decision towards end of next NLTP period.
Affordable waters investment	National	$120bn - $185bn over next 30 years	Ongoing reform	**Low.** Entities likely operational by end of second year of NLTP period. Long lead times for scaled up investment enabled through borrowing capacity means impact in 2024-27 is likely to be modest. Transition may however absorb internal council capacity.
Auckland port relocation	Auckland / Northland	TBC	Feasibility / options	**Nil – Low.** Highly uncertain, and unlikely to materially progress within next NLTP period.
Auckland Airport build	Auckland	$3.9bn	Consultation	**Low – Med.** Works predominately expected to occur during next NLTP period.
Dunedin and Whangarei Hospitals	Dunedin & Whangarei	$1.5bn – $2.25bn	Under construction / in planning	**Low – Med.** Works predominately expected to occur during 24- 27 NLTP period but will extend into next period.
Huia Wastewater treatment plant	Titirangi, Auckland	$185m	EOIs open	**Low – Med.** Forecast construction commencement is 2024.
Canterbury multi-use arena	Christchurch	$683m	Developed design completed	**Med.** Early works is set to begin in June 2022, construction of the arena is estimated to be completed by mid-2026.
Inland Rail Freight corridor	Australia	$31.4bn AUD	Under construction	**Low – Med.** Construction commenced 2018 and is due to be completed in 2031.
Asian Renewable Energy Hub	Australia	$22bn	Feasibility / options	**Low.** In detailed planning. Planned construction commencement Jul 2026.
Flood recovery	Flood affected areas	$1 billion +	Various stages of planning and delivery	**Unclear.** Will have an ongoing impact on demand in flood affected areas and may reduce scope for NLTF investment in certain regions.
National Resilience Plan	Nationwide, NZ	$6bn	Various stages of planning and delivery	**Unclear**. Plan to deliver the medium-and long-term infrastructure investments New Zealand needs.

Construction and Infrastructure Markets (5 of 5)

Key observations

- The Governments five year commitment to infrastructure spend has increased year on year since 2021, with additional funding announced in Budget 2023 likely to have some impact on demand in the 24-27 NLTP period.
- Governments vision for infrastructure announcement and strategy for the next five years through “The Infrastructure Action Plan” May 2023 further demonstrates commitment to a significant work programme.
- In general, our view is the most significant of the broader NZ infrastructure projects are likely to fall outside of the next NLTP period and therefore pose limited risk to the delivery of the proposed spend.
- Strategic decisions in Australia will impact on the deliverability of New Zealand’s Infrastructure Pipeline, but the extent of the impacts are uncertain as the Infrastructure Pipeline is undergoing a review.
- However, these projects, along with the major transport mega projects scheduled for the following NLTP period are likely to create significant market capacity impediments if all were to commence construction in the late 2020s.



Current track record of delivery in current NLTP (1 of 3)

Introduction

This section summarises the available evidence on the current track record of delivery in the current NLTP period, and the extent to which there is evidence that this has been primarily caused by market capacity constraints. Our key sources for this are:

(i) NLTP annual report output performance measures.

(ii) NOC performance measures (specifically focused on NOC contract performance).

(iii) Actual expenditure relative to budgeted expenditure in the current NLTP period.

(iv) Broader commentary derived from informal market sounding and desktop research.

While this is not an in-depth analysis of current performance, it is intended, in totality, to provide a high-level overview of current delivery against expectations. We have not focused on measures of system health, as these are impacted by broader planning, prioritisation and budget factors, rather than supplier capacity.

(i) NLTP annual report output performance measures

While relatively high-level, the NLTF output measures for 2021/22 indicate the following across key activity class measures:

- **State highway improvements:** While spend exceeded forecast by 4%, performance measures for the delivery of projects against 'agreed standards and timeframes' were not met for either NLTF or Crown-funded projects (86% and 58%, respectively against a target of 90%). Key issues cited were greater optioneering, and remedial work, NZUP reprogramming and ongoing impacts of COVID-19 (including material and supplier availability).
- **State highway maintenance:** Actual spend exceeded budget by 5% due to higher emergency works and contract prices. The proportion of activities delivered to agreed programme was rated 85% against a target of 90%. The decline from previous years (where this was rated 96%) was ascribed to the inclusion of emergency works and data accuracy issues.
- **Local road improvements:** Actual spend exceeded budget by 6%, although delivery against agreed timeframes was 68% against a target of 80%. This was attributed to delays in specific projects (e.g. due to consenting, specific supply issues) and ongoing impact of COVID-19.
- **Local road maintenance:** Actual spend exceeded budget by 12% primarily due to higher spend on emergency works. Delivery against agreed programmes of 85% did not meet the 90% target due to rising costs, redirection of resources to emergency response staff illnesses and poor weather conditions.
- **Total spend:** Actual expenditure across all activity classes for 2021/22 exceeded the budgeted amount ($4.5bn vs. budget of $4.4bn).

Key observations

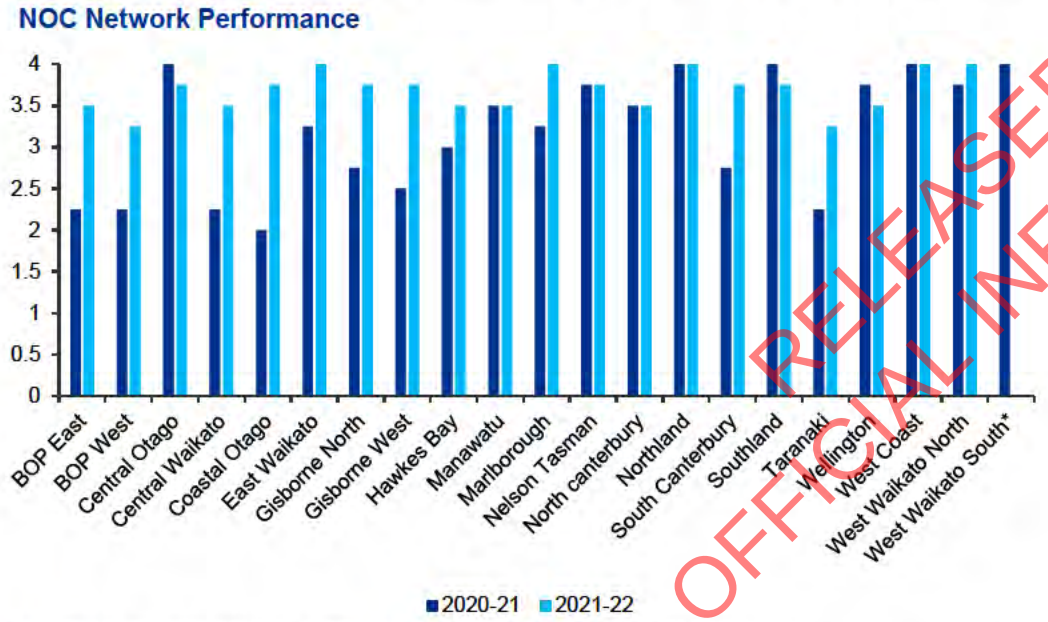
- While reasonably high-level measures, the performance measures indicate a mixed picture with regard to delivery in the first year of the current NLTP. In general, maintenance programmes were generally delivered under target, while improvement projects have faced project-specific delays for a wide range of reasons, although primarily relating to pre-construction issues and ongoing impacts of COVID-19.

Current track record of delivery in current NLTP (2 of 3)

(ii) NOC performance

The Key Results Areas (KRAs) that sit alongside NOC contracts for the delivery of State Highway maintenance is intended to measure the performance of the NOC contractors. For 2020/21 and 2021/22, the key relevant measure provided is 'Network Performance' which is focused on measuring the contractor's performance during the development and delivery of asset renewal programmes. Under the KRA metrics, a 4 represents the highest level of performance (generally 100%), while a 1 represents the lowest score (generally <80%).

Diagram: Summary of network performance KRA (2020/21 – 2021/22) by region



*Reporting for West Waikato South combined with West Waikato North from 2021-22 onwards

Waka Kotahi's overall asset condition measure is relatively stable and remains high over the last five years (i.e. ~96-97% of the state highway network 'meets minimum asset condition requirements'), however, broader evidence illustrates the current pressure on maintaining the condition of state highway assets. This is generally ascribed to a number of causes, including underinvestment in renewals over the last decade, increasing freight and traffic, weather conditions, and some NOC performance issues. For example:

- The actual levels of resurfacing and rehabilitation were generally below what was estimated as required to maintain asset condition between 2011/12 to 2019/20.
- Similarly, the asset sustainability ratios for pavement assets has been declining (60% in 2021/22) and is below what would (theoretically) be required to sustain assets, although noting the decline over time is partly driven by growth in the asset stock from newer assets not requiring renewals.
- An increase in average roughness, decrease in smooth travel measures and increase in the percentage of the network with rutting over the period of 2015 – 2020.

Key observations

- There is some variation in the levels of performance, but on the whole, according to official performance reporting undertaken by Waka Kotahi, the NOC network appears to be achieving reasonably high levels of delivery performance with regard to delivery against programmed works. In general, delivery performance improved as a whole between FY20/21 to FY21/22.
- Notwithstanding the above, there appears to be considerable pressure on the sustainability of the condition of the state highway network.

Current track record of delivery in current NLTP (3 of 3)

(iii) Planned expenditure vs. forecast expenditure in current NLTP period

The table below summarises the initial planned spend relative to updated forecast spend for the current NLTP period. While this does not measure the *quality* or *efficiency* of that spend, material underspends in the current NLTP period would be a potential indicator of potential Waka Kotahi or market capacity issues. Notwithstanding inflation capital budget underspends are not unusual for infrastructure providers, in particular local government.

	Activity Class ($m)	NTLP total (21/22 – 23/24)	22/23 Approved TIO allocation	22/23 Current forecast spend	22/23 % variance	NTLP total (21/22 – 23/24) forecast spend	NTLP total forecast spend (% of target)
Continuous Programme	State Highway Maintenance	2,805	1,028	957	93%	2,693	96%
	Local Road Maintenance	2,339	1,040	824	79%	2,359	101%
	Public transport services	1,330	451	496	110%	1,452	109%
Improvements	Road to Zero	2,673	1,097	842	77%	2,540	95%
	Public Transport Infrastructure	1,699	770	581	75%	1,501	88%
	State Highway Improvements	2,640	1,280	896	70%	2,752	104%
	Local Road Improvements	671	221	148	67%	506	75%
	Walking and Cycling	618	314	160	51%	538	87%
	Total / average	**14,775**	**6,201**	**4,904**	**79%**	**14,341**	**97%**

Key themes from market engagement (1 of 2)

Introduction

As part of this report, we engaged at a high-level with a small number of suppliers and other market participants. The material on these slides provide a summary of what Mott MacDonald heard through that process, and therefore reflect the anecdotal nature of the exercise.

A. Comments from maintenance suppliers

Despite official performance reporting on NOC contracts rating generally high levels of performance, feedback from industry indicated that the existing maintenance NOC contracts are no longer fit for purpose and have been delivering sub-optimal outcomes. The feedback stated this was a result of inefficient spending and inability to prioritise work activities largely because of budget constraints despite a view that perhaps undertaking work more innovatively could deliver value. This has been acknowledged by Waka Kotahi despite recognition for some efficiency gains (e.g. cost savings and targeted focus on maintenance within the last few years), so a new Integrated Delivery Model (IDM) is being proposed to be more flexible and collaborative. This enterprise model is like that being used in the UK through the Project 13 framework approach which focuses on outcomes. The IDM has merit in that it promotes flexibility and a more preventative maintenance philosophy, as well as enabling a wider integrated supply chain participation and encouraging greater collaboration. However, some suppliers have advised that they would not be able to respond immediately and effectively, whilst others stated they could double workload should an increase in funding be provided or a change in approach of delivery model.

Suppliers undertaking local authority maintenance work have been constrained by road renewal funding resulting in a reduction in volume of work and therefore non preventative behaviours versus reactive and hence a declining asset condition as documented by WK and road controlling authority pavement condition reporting. Due to funding challenges, there is evidence of declining productivity as a result of greater focus on small road network surface repairs to maintain a minimum level of service for the road network rather than the level of structured resurfacing programme that has occurred in previous years.

It is acknowledged that in general it will take time for the market to invest in upskilling, recruiting and training additional labour and professionals to accommodate the breadth of requirements of the maintenance portfolio. There is opportunity to redivert skills from other industries like land development to drive high quality outcomes should funding increase.

B. Pipeline and certainty

This is a fundamental requirement for any supplier to invest and therefore capacity would be further enabled across numerous sectors. Funding uncertainties and reallocating of activity class budgets is evident across the NLTP portfolio. Reasons for this are not always clear but there is evidence of delays to projects through the timing of business case processes inhibiting the ability to provide a streamlined portfolio of transport infrastructure pipeline. For example, delays can be as the result of insufficient investigation, securing property and consenting certainty at the early stages of projects. These delays have a direct impact on cost budgets allocated for various phases as projects progress, and inevitably could change from inception through to delivery.

Transport infrastructure opportunities in the global market are abundant (e.g. Australia and Asia close to New Zealand), but organisations need certainty if they are to invest and target projects that offer good return on investment. Should an increase in funding be made available with incentives for innovation, it is important to understand that commercial engagements need to be cost effective and risk allocation is to be shared equitably to incentivise suppliers to participate in New Zealand. This may include an ability to invest in plant to improve productivity should there be pipeline certainty. Organisations will positively respond to opportunities if the environment in which to participate is sustainable as professional/specialist skills are transferable into different areas so the ability to meet demand could easily be achieved in the right environment.

Key themes from market engagement (2 of 2)

C. Broader issues raised in market sounding

- **Decarbonisation:** Although not currently a major risk that is constraining delivery, there was a view that if NZ were to seriously think about future industry needs to realise international and legislative commitments to climate change, then it is behind target despite clear guidance being provided to align with new policy in this area. Inputs to infrastructure delivery such as trucks and machinery are high emitters, and if the Government was to take serious steps, it was noted the country would need to decarbonise the infrastructure delivery fleet through the importation of new, low carbon machinery / give up commitments. The view that was taken was this would not be called for in the short term, but at some point would be necessary to increase the pace of change. It was noted there would be big bottlenecks getting updated machinery to meet requirements.
- **Reduced accountability for project slippage:** Anecdotal evidence was that an increase in project delays as being due to the dual shocks of GPS funding shifting focus from motorways to safety improvements, and subsequently requiring the programme to be recalibrated and NZUP requiring Waka Kotahi to retool, which strained the organisation's oversight / programme management capability internally.
- **Risks of specific material inputs:** There was concern about the sustainability of the supply of bitumen in New Zealand. Historically New Zealand produced its own bitumen, but the closure of Marsden, and Z-energy's upcoming exit from the market will halt all local production and shift the market to a reliance on imports. Furthermore, delivery of material was historically supported by off-coast tankers, but will not be utilised going forward, placing more reliance on effective project coordination and storage.

  Waka Kotahi recently undertook a review of the national bitumen supply chain and found that there should be an effective market supply of bitumen under a full import market model, noting the open market model should provide competitive pricing and fair access to product. Furthermore, in order to keep up with increasing import volume a Bitumen tank has recently been refurbished and opened in Lyttleton to help increase onshore storage.
- **New Zealand as a destination for skilled labour:** There was a view that New Zealand is struggling to compete in the global market for talent. It was commented that while New Zealand is generally viewed as an attractive destination for labour, other countries can often have more competitive immigration policies. Australia, for example, has a more aggressive approach to offering construction workers visas. It is acknowledged that it will take time for the market to invest in upskilling, recruiting and training additional labour and professionals to accommodate the breadth of skills required to continue to service the pipeline.
- **Reduced ability of suppliers to invest in people:** There is a common theme that the present structure of NOC contracts has left little residual margin for suppliers to invest in their staff. Suppliers would seek to invest in projects that offer good commercial engagements and procurement processes and the ability to return on their investment into people, the centre point of any organisation that competes in the transport infrastructure market.

Council capacity (1 of 4) - introduction

Introduction

The delivery of a number of activity classes is primarily undertaken by local authorities, with co-funding provided through the NLTF in accordance with the applicable Funding Assistance Rate (FAR). In particular, these activity classes are predominately:

- Local road maintenance
- Local road improvements
- Walking and cycling improvements
- Public transport services (primarily operating funding to support subsidised fare levels)
- Public transport infrastructure

The successful delivery of these is primarily driven by a combination of available local 'matching' funding and the internal capacity/capability of local authorities to procure and deliver projects.

Scope and structure of this section

The assessment of council capacity and capability is challenging given the lack of consolidated data sources, and that local factors can impact delivery of specific projects. Given time constraints, we have considered:

i. general evidence on council deliverability issues.

ii. the level of historic expenditure by local authorities and the extent to which the new GPS requires a significant uplift on historical averages.

iii. evidence of the financial constraints facing Councils, particularly debt to revenue covenants imposed by the LGFA and increases factored in existing LTPs.

(i) General commentary on Council deliverability issues

A key challenge in assessing council deliverability is a lack of consolidated data sources to confirm anecdotal evidence derived about a reasonably diverse sector. However, based on discussions conducted in this work and broader intelligence, we are aware of the following general issues:

- **Under-delivery of infrastructure budgets:** We understand that several Councils have struggled to deliver their proposed capital programmes, with there being a general optimism bias on their ability to design, consent and deliver projects. This is also driven by limited capability in programming spend across LTP periods. We understand that Waka Kotahi generally assume approximately 15% underspend to take account of this optimism bias, although current year spending on improvements is currently tracking around 35% below approved levels. However, Waka Kotahi largely attribute this to poor weather conditions over the last year and for this to be 'caught up' in the final year of the NLTP.
- **Councils have a mixed track record with regard to broader asset management:** The level of asset management capability across councils is variable, with in some cases limited data on the performance and condition of their asset portfolios. Some councils have invested more heavily in data collection to inform more accurate renewals budgets.
- **A broader range of reforms will absorb Council capacity:** While difficult to quantify, policy reform programmes such as the creation of 3-water entities, ongoing RMA reform and responding to weather events may potentially reduce council capacity to increase infrastructure delivery as these wider reforms are underway.
- **Greatest challenges are delivering improvements:** New capital spend and upgrades impose the most significant capability challenges for councils, relative to regular renewals/maintenance spend being relatively less complex given their year on year regularity.

Council capacity (2 of 4) – local road maintenance

(ii) Local road maintenance spend by region

The table below summarises historic actual spend (i.e. both local share and FAR funding) for the local road maintenance activity class. While the annual % increase in the next NLTP period is greater than the historic average in nominal terms, it is not significantly so. Further, in line with our analysis above, the change in real activity is significantly less than that implied by the nominal totals.

	Name	2018/19 to 2020/21 Actual spend ($m)	NLTP21 - 24 Proposed spend ($m)	NLTP 24 - 27 Proposed spend (nominal) $m	Implied annual increase (2021/22 to 2026/27)	Average annual % increase (2015/16 to 2021/22)	NLTP 24 - 27 Proposed spend (estimated real)	Real % increase between NLTP periods
Region	Auckland	796.5	951.2	1,243.0	8.3%	6.12%	1,093.4	15%
	Bay of Plenty	174.6	206.8	235.1	4.5%	6.91%	206.9	0%
	Canterbury	446.7	430.4	511.8	5.5%	(0.26%)	450.3	5%
	Chatham Islands	10.5	11.4	11.7	1.3%	0.24%	-	-
	Gisborne	110.3	82.6	96.6	4.8%	13.92%	85.0	3%
	Hawkes Bay	166.4	155.0	179.6	4.2%	5.48%	158.1	2%
	Manawatu/Whanganui	251.7	257.8	295.1	3.6%	(1.21%)	259.7	1%
	Marlborough	45.8	52.2	61.7	5.1%	31.47%	54.3	4%
	Nelson	21.8	26.3	32.5	6.1%	4.91%	28.6	8%
	Northland	207.0	238.7	283.2	5.5%	1.69%	249.2	4%
	Otago	235.9	262.8	310.4	5.2%	6.14%	273.1	4%
	Southland	124.2	145.9	173.1	5.2%	5.64%	152.4	4%
	Taranaki	98.9	110.3	126.1	3.7%	(0.73%)	110.9	1%
	Tasman	43.9	53.5	64.8	6.3%	14.21%	57.0	7%
	Waikato	390.4	448.4	537.9	5.9%	5.92%	473.2	6%
	Wellington	279.7	334.6	365.0	2.4%	7.68%	321.2	(4%)
	West Coast	51.0	54.4	61.4	3.1%	4.94%	54.0	(1%)
	Total	3,455.3	3,822.3	4,589.0	5.6%	4.87%		

Council capacity (3 of 4)

(iii) Financial constraints on local authorities

Local authorities primary revenue sources are typically general and targeted rates charged to residential and commercial landowners. From a financial perspective, the level of council infrastructure spending is primarily constrained by:

- **Debt covenants and limitations:** Councils must generally operate within financial covenants set by the LGFA, as well as by rating agencies. In particular, the Net Debt / Total Revenue ratio for LGFA purposes should be lower than 280% for rated councils (and below 175% for unrated councils). Many councils however have internal policies that may be set below this level. This is often the focus of financial capacity constraints with regard to infrastructure spend and generally the most challenging covenant to comply with. This generally impacts a council's ability to borrow further for infrastructure investment, rather than capacity for additional ongoing operating programmes.
- **Revenue limitations:** Political appetite and affordability constraints on the level of general rates charged to the community. While there are no definitive affordability limitations, many councils seek to keep rates at below 5% of disposable income. The level of rates revenue generally impacts a council's ability to both raise debt and fund ongoing operating costs.

A. Debt covenants constraints

Based on June 2022 actual covenant data provided by LGFA, we note that most local authorities are well below the 280% debt to revenue LGFA covenant, with an average of 91% across councils with a credit rating, and 36% across unrated councils. The councils with the greatest covenant pressure tend to be, although not exclusively, the 'growth' councils. Notably actual results for 2022 were generally better than originally forecast, some of which we understand is driven by the front-loading of capital expenditure in the LTP period (with actual delivery being lower), under-signalling of rate rises in later years of the LTP and (in hindsight) overly negative assumptions about the impact of COVID-19 on revenue by some councils.

We note that water reform may significantly impact the debt headroom of many councils, with the transfer of water assets expected to have a materially positive impact on debt headroom for most councils although the timing of this may occur late in the NLTP period.

Table: Net Debt / Total Revenue ratios (highest 10 listed)

Name	June 2022 actual	Forecast 2022 (without water)	Forecast 2022 (after water transfer)
Auckland Council	212%	236%	163%
Tauranga City Council	201%	213%	70%
Rotorua District Council	178%	181%	140%
Kapiti Coast District Council	175%	185%	136%
Hamilton City Council	154%	194%	86%
Wellington City Council	150%	210%	176%
Queenstown Lakes District Council	149%	158%	94%
Horowhenua District Council	142%	182%	74%
Christchurch City Council	135%	264%	154%
Hastings District Council	128%	136%	47%
Average (all rated councils)	**91%**	**106%**	**56%**
Total (all unrated councils)	**37%**		

Council capacity (4 of 4)

B. Historic revenue and expenditure of councils

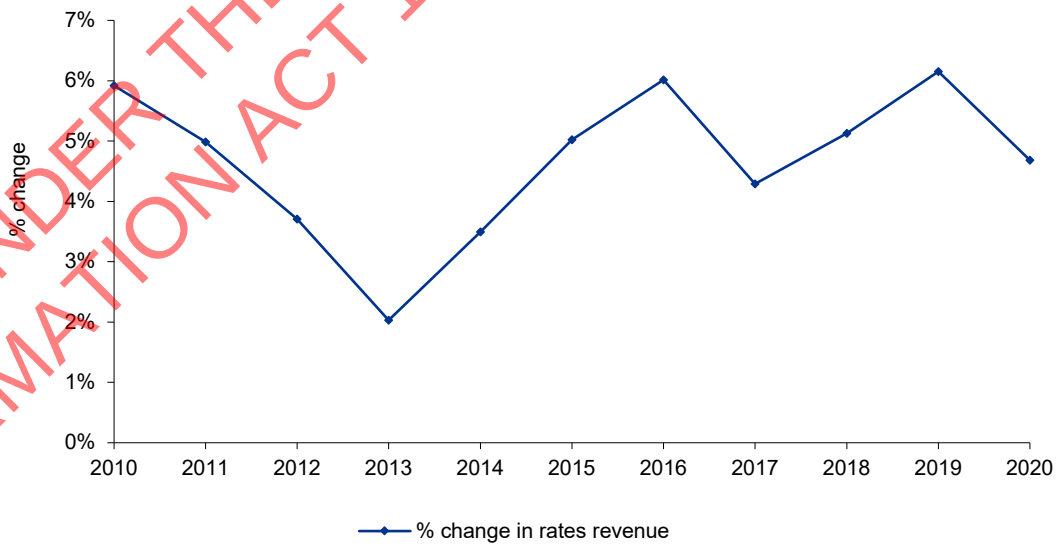
While regional councils prepare RLTPs, the funding is predominately sourced from applicable local authorities as agreed within each of their Long-Term Plans. Forecast 2024 LTP revenue and spending across all of local government was not available for the purposes of this review, but historic data does provide a summary of average increases in both rates revenue over the last decade.

As part of their LTP programmes, councils will typically, in the first instance, provide and fund ongoing services to maintain their existing Level of Service. The level of additional spending on new / upgrade capital and operational projects is then determined based on the acceptable level of rates increases, as well as the council's broader financial strategy.

While the increase in local road maintenance expenditure (total) year on year in the proposed NLTP is approximately 5-6%, we note that this does not appear significantly higher than historic annual increases in rates revenue over the last decade (annual average increase of 4.5% p.a). While specific councils may ultimately choose to not increase rates or make different prioritisation decisions, the proposed increase does not appear to be an outlier relative to results from the last decade. Where there are specific regional issues that may prevent councils from funding this level of increase, we would expect this would be surfaced as part of the RLTP process, with the expectation that other local authorities could likely increase their matching funding.

In our observation, Councils will typically prioritise expenditure that attracts matching NLTF funding over alternatives that do not further reduce the likelihood that council financial constraints, in their totality, will be a significant barrier to the delivery of the NLTP.

Diagram: Historic annual council rates revenue – annual % change



Delivery risk conclusions (1 of 2)

Proposed real output looks flat

In terms of market and local government capacity demands, the forecast 2021-24 NLTP is characterised by a nominal increase in spending but an expected decrease in real output compared to the 2018-21 period, alongside a major shift from improvements to maintenance and renewals.

Outside the NLTP, the outlook in the 21-24 period is characterised by a mix of winding down demand (CRL, Covid stimulus demand), winding up demand (ALR, Flood Recovery) and stable demand (NZUP) which collectively signals a continuation of current (high) demand rather than a clear increase. This contrasts with post-2027 major land transport projects which, while inherently less certain, potentially represent a very large increase in demand and complexity that the existing market would be unlikely to have capacity to deliver simultaneously, unless this change was communicated early to the market to enable appropriate planning.

Local government is constrained but likely able to adjust to this change

Local government debt capacity, in the near-term, appears healthier than most authorities anticipated. It is possible that some councils would be unwilling to make the necessary rates increases or reprioritisations to meet their share of local maintenance funding, but this risk is mitigated given the sacrifice of NLTF FAR funding. If this was the case through the RLTP process, there would likely be other councils able to receive greater funds.

Local government clearly faces significant internal capacity constraints due to a variety of sources, including engaging with major reform programmes and partnering in delivery of the range of Crown-funded programmes for local infrastructure. This can be seen in the slower pace of capital improvement works compared to the ambitions in recent years.

Asking local government to do more would be challenging. However, the shift away from improvements towards maintenance proposed likely represents a meaningful decrease in operational demands on councils compared to the 2021-period from the NLTP itself.

The sector will remain tight and a real output increase would be difficult

The infrastructure, and wider construction markets remain tight due to a mix of domestic and international pressures. Sector inflation continues to significantly outstrip wider inflation measures. Delays are common, both from capacity tightness and budgets that have not been sufficient to procure what they were intended to. Elevated inflation is eroding the quantity of what could be procured within the 2021-24 NTLP.

There is currently very limited ‘slack’ in the market and no reason to think that real output could grow rapidly in the short-term, although the sector has shown an ability to grow materially over the medium-term in response to sustained demand and could likely continue to do so.

Outside of land transport, the infrastructure pipeline story looks similar, with no obvious driver of major increased demand in the 24-27 period, but with a possibility of sustained higher demand in the years following. Social infrastructure demand has been elevated due to a series of pre-Covid and Covid-era Crown-funded investment programmes, but this appears unlikely to be repeated in the near future. Higher interest rates are taking heat out of private sector demand, most clearly seen through the first annual decline in residential dwelling consents rates in over a decade.

Market sounding consistently pointed to a sector that is able to maintain stable levels of output, but would struggle to do much more in the short-term.

Delivery risk conclusions (2 of 2)

On balance we assess the risk to delivery as low to medium. The programme can be delivered but will contribute to pressure on the sector in the short term

Overall we assess the risk to delivery from market or local government constraints as being *low to medium*. While both the market and local government might struggle with a meaningful increase in real activity, it is likely there won't be direct delivery risks under the relatively flat real output expected.

Despite market pressures likely easing somewhat, on balance a reasonable base case expectation is that the market remains tight. Maintaining real levels of output will contribute to the sustained tightness of the market, and can be expected to play some role in sector wide inflation. Furthermore, it may crowd out other areas of construction and infrastructure works.

This assessment is predicated on our understanding of the pace and scale of the wider pipeline and in particular, major land transport projects. Choices on the timing, pace, scale and funding model for those projects will ultimately have larger impacts on market and local government capacity than an annual increase in NLTP spending on the order of $700 million which is largely price driven.

If those projects were to advance more quickly than is currently proposed, which appears unlikely but possible, then delivery risks to the NLTP would become more acute. If several of these projects were to advance under currently proposed timeframes, it is realistic that labour and materials capacity constraints could be so acute as to make a future NLTPs (even if kept flat in real output terms) undeliverable or fundamentally unaffordable.

We do not consider that capacity constraints require a reduction in investment

However, for the 2024-27 period we do not consider, on balance, that risk to market or local government capacity to deliver are clear enough for this to require a reduction in investment from the proposed level. Given market conditions, reduced expenditure might contribute to some reduced inflation and better value for money in the short-term, although the impacts on service levels and potential medium-term impacts on future costs and market capacity would need to be considered.

It's notable that while evidence for infrastructure pipelines in New Zealand has improved, it remains still largely confined to consideration of cost. There is no consolidated evidence based on the actual inputs (labour, physical capital, materials) that would be necessary to deliver on the range of major works and business as usual activity. It is commendable that the Ministry has sought to consider market capacity as part of this process. However, absent an improved evidence base for the actual pressure various projects would place on the system, it will be difficult to make system-level capacity trade-offs or identify the gap between current sector capacity and what would be required to deliver on plans in considering future NLTP or wider central government infrastructure investment.

03

Draft GPS funding and wider observations

Funding range in Draft GPS (1 of 2)

Comparison of Draft GPS funding ranges to forecast NLTP

The draft GPS that was provided is based on expected NLTF revenue of 'about $13 billion' compared to a forecast NLTP of $17.8 billion providing for:

- about $11-$12 billion is available to invest across activity classes – this is broadly equivalent to annual spending at the lower funding ranges plus about $900 million available for Waka Kotahi to allocate (and apply its discretion to increase spending above the lower funding ranges); and
- the remaining $1-2 billion is estimated to be required to cover Waka Kotahi debt repayment obligations.

The GPS includes some activity class ranges broadly in line with those in the forecast NLTP, while others are significantly below. However, as noted, there would be insufficient revenue to fund at the midpoint of most activity class levels.

Additionally, we understand the activity class ranges in the most recent draft of the GPS were based on the model v6.7 forecasts which as discussed above have been updated. Due to an adjustment in the forecasting approach, the public transport services activity class range was set much lower than is now expected to be required. We assume that if the final GPS were to be based on this level of revenue, further reductions to most improvements activity classes would be allocated to public transport services.

We anticipate that under this scenario Waka Kotahi would exercise most of its 'discretionary' funding towards continuous programmes. There would likely need to be substantial walking back of commitments for improvements that have been made, but have not yet been contracted for. Limitations on the ability to do this would result in less funding for continuous programmes. In some cases, the Board's preferred approach would likely be limited by the breadth of the funding ranges.

	Activity Class	Forecast Spend 24-27 ($m)	Activity Class Ranges in Draft GPS	Activity Class Midpoints in Draft GPS	Midpoints as a percentage of forecast spend
Continuous Programme	State Highway Maintenance	$3,582	$3,010 – 4,100	$3,555	99%
	Local Road Maintenance	$2,982	$2,350 - 3,020	$2,685	90%
	Public Transport Services (NZTA Share)	$2,271	$1,608 - 2,990	$1,670	74%
	Debt	$1,483	$1,483 - $1,483	$1,483	100%
	Investment Management	$205	$205 - 240	$223	109%
Improvements	Road to Zero	$2,880	$1,740 – 2,100	$1,920	67%
	Public Transport Infrastructure	$1,845	$700 - $1,740	$1,220	66%
	State Highway Improvements	$1,016	$500 – 850	$675	66%
	Local Road Improvements	$558	$140 - 350	$245	44%
	Walking and Cycling	$508	$250 - 460	$355	70%

Funding range in Draft GPS (2 of 2)

Funding at the levels in the draft GPS presents material risks

Funding the 2024-27 NLTP at around $13 billion would represent a large reduction in real output, noting that we assess that even the forecasted $17.8 billion represents an expected reduction in real output compared to the $15.7 billion in NLTP 2021-24.

We can identify no basis for such a large cut in land transport investment from our analysis. Had we identified fundamental forecast errors that suggested far less funds than expected would be sufficient to meet the needs of continuous programmes, then perhaps a major reduction would be justified. However, we have not found this.

The information available does not allow us to meaningfully assess the service level impacts of such a reduction. However, it seems clear that funding at this level would leave at least some fundamentally required maintenance and intended improvements unfunded. This suggests that alternative funding sources would be required or long-term system liabilities would be accrued requiring elevated levels of future spending. The impact on the road network as a result of this, in conjunction with continued land use growth, would likely deteriorate functional levels of service.

While it would reduce transport, and in general, construction and infrastructure sector pressure, as discussed earlier, there does not appear to be a level of system pressure that would justify such a response on that basis. Given sustained international demand, substantial short-term reductions would risk a hollowing out of New Zealand capacity or at a minimum reducing sector growth potentially exacerbating the intended increase in activity later in the decade as several major projects are intended to begin.

In the context of the revenue limit in the drafted GPS, the relative balance provided for in the activity class ranges in the draft GPS appears to be a reasonable reflection of practical priorities in terms of 'keeping the lights on' through continuous programmes and reflecting the strategic direction of the GPS and its priority on maintenance. Nevertheless, we consider that under such a funding scenario, maintenance would also see a material reduction in real activity. It is difficult to see how the outcomes sought in the GPS could be achieved within those funding limitations.

Limitations of assessing the impact of funding at $13 billion level

There are a number of limitations on our ability to meaningfully assess the impact of limiting funding to $13 billion over the 24-27 NLTP period:

- It is unclear how this would be managed by Waka Kotahi in practice, given that, at these levels there would be insufficient funds to even meet existing commitments. We have no basis on current information to determine which projects would not advance in their current form or be deferred to the next NLTP period.
- There is insufficient consolidated evidence of service level impacts on different funding levels to make any general assessment of either, the impact of much lower levels of improvements required, or the materially reduced expenditure on continuous programmes.
- The impacts on the market resulting from failing to meet existing commitments and reducing real maintenance activities are difficult to assess with confidence although we would see genuine medium-term risk.

With further time and scope, a more detailed analysis of the service levels and market implications of this, or some other reduced funding level, may be possible.

Forecasting process observations (1 of 3)

There are opportunities to improve the forecast and advice process for the future

Our work did not involve a detailed review of the process that was followed to develop the forecasts and apply them to Ministerial advice on GPS activity class ranges, instead focusing on the *outputs of that process*. However, through our review of the forecasts we have identified a number of broader observations about the process which the Ministry has requested we include. These observations are intended to provide context to our core conclusions as well as potentially inform any changes to the process in the future.

As we have not undertaken a detailed process review, nor engaged with the full range of staff and senior leadership connected to the process, these conclusions and recommendations should be treated as indicative, subject to further consideration and validations.

As noted in the Background and Scope section these observations are limited to the NLTP forecasting process to inform the draft GPS Activity Class ranges. They should not be interpreted as observations about any other part of the Ministry of Waka Kotahi's operations.

It does not appear that Waka Kotahi was requested or directed by the Ministry or the Ministry to apply different forecasting approaches than those used. Therefore, this commentary should not be interpreted as a failure to meet expectations

Underpinning these observations is our view that the potential importance of the NLTP forecasting process is very large given it is intended to inform billions of dollars of investment/revenue choices. The 'marginal' investment choices that Ministers must make represents one of the most material regular fiscal decisions required of the Government. While trade-offs always need to be made in determining resourcing and standard of analysis, the criticality of these decisions suggests a relatively high standard should be applied.

Under each areas of observation we have provided a high level recommendation. *More generally, we recommend that well in advance of the next GPS setting process, Waka Kotahi and the Ministry undertake a joint programme to improve practice and impact of the analysis and advice contributing to the setting of GPS activity class ranges.*

1. The importance of the process justifies greater clarity, focus and resourcing than appears to be the case currently

Overall, the standard of the process overall is not as high as we would expect. Compared to regulated network infrastructure providers (e.g. Transpower), large capital Crown funding or privately funded programmes the degree of sophistication of the forecasts and the evidence behind them appears comparably low. Land transport is inherently complex and more subject to changing government priorities particularly with respect to improvements. However, maintenance and renewal of the existing asset base is less subject to these challenges.

The primary approach has been for models and analysis created for the purpose of Waka Kotahi internal forecasting to be repurposed to this process. The models are likely fit for purpose for their primary use, particularly given the need to update them regularly for monitoring. However, by their nature they are status quo oriented and not designed to inform the macro-level cost/service level trade-offs than the process should preferably be working toward.

For example, while more detailed bottom-up approaches to forecasting cost for continuous programmes may be impractical to do on a frequent basis for internal monitoring, doing it for a three-yearly process intended to inform macro-level investment choices appears appropriate. The default approach of using existing models rather exploring the most fit for purpose approach may have meant that this does not appear to have been considered.

This may result from the lack of clear expectations of evidence requirements or form of forecasts appropriate to inform a choice on overall investment level through the NLTF. These should likely be set by the Ministry in consultation with Waka Kotahi. As a result there isn't a shared understanding of what 'good looks like' that would allow the Ministry of Transport to either feedback to the Waka Kotahi, or advise the Minister on the adequacy of the forecasts.

As part of the a review clear expectations for forecasting, grounded in its purpose for informing funding ranges and associated revenue, should be agreed between Waka Kotahi and the Ministry.

Forecasting process observations (2 of 3)

2. The process is not designed to be effectively independently reviewed, improved planning for review process would help

We understand that this review process was not initially planned (although it was always anticipated that the forecast would be reviewed by the Ministry). Potentially as a result, the forecasts were not prepared in a way such that they are ready to be independently reviewed. In many cases, the core materials (and in particular model 6.7) provided lacked information on the basis of methodology and assumptions that would be typical for models expected to be subject to independent review.

In many cases these underpinnings were able to be provided through an iterative information request process, but this required a substantial engagement and collation work by Waka Kotahi and had not previously been shared with the Ministry.

We understand that the Ministry had, as of late 2022, intended to establish an Independent Advisory Function to review the cost forecasts, but that it was unable to establish the function in time for this years' process. We anticipate that had such a group been established, it may have struggled to validate and test the forecasts with the information readily available. However, it is also possible that had the function been established and greater expectation of a review process established, the materials would have been prepared differently in anticipation of the review.

We would recommend that, as part of the requirement setting for the process in the next GPS, a process for independent review be established early, with the function and process of that review also defined.

Example: Setting the Efficiency Factor

One specific example serves to illustrates several of the issues with the current approach. The models for forecasting maintenance spend, which rely on a numbers of inflators and adjustment factors, included an efficiency factor. This factor is intended to reflect improved productivity in delivery or procurements that wouldn't be captured by general output changes or inflation in inputs. During its own review of the models used for forecasting, the Ministry of Transport queried why the value for the efficiency factor had been set at 2% efficiency improvement per annum.

Following the query no clear basis could be identified for setting the factor at that level (presumably practitioner judgement within Waka Kotahi in practice), and as a result the factor was adjusted to 0%.

We see three issues with this scenario:

1. *The Ministry should not have needed to query what was underpinning the 2% setting.* This was a material assumption potentially shifting overall forecasts over $100 million. The evidence behind this input, whether it was based on robust long-term trend data or simply professional judgement should have been clearly documented.
2. *There should have been an evidence base to inform this input.* It is reasonable to expect Waka Kotahi to have a view on expected efficiency improvements (or for that matter losses) in its large maintenance spend and that these be applied to its forecast costs and then tested against actual results. Ideally this input would be understood as a function of the level of investment.
3. *The result should have been additional analysis.* When it was identified that there was not a clear basis for the current assumption, it should have been retested and what evidence was available brought to bear, or absent that, some form of consensus based setting undertaken. Instead one non-validated input (2% improvement) was replaced with an equally non-validated input (0% improvement).

Forecasting process observations (3 of 3)

3. The process should provide clearer price/quality trade-offs

At the highest level the process of developing cost and macro-level investment ranges should be about supporting Ministers to make cost/service level trade-offs to determine the preferred level of revenue and investment. Instead the process has been based on a somewhat arbitrary 'do minimum' standard based on status quo continuous programmes and previous commitments. This is an understandable approach given the constraints on revenue setting and the complexity and shifting priorities in the land transport system.

Nevertheless, it seems reasonable for Ministers to expect a clearer view on the short and long-term implications of different investment levels than seems possible under the current approach. We cannot be certain what standard of analysis is realistic at this stage, and it seems likely that difficult approaches will be fit-for-purpose across different activity classes. Nevertheless, at a minimum it should be possible to provide a clearer sense of:

- The cumulative expected service level impact of expected improvement investments
- The whole-of-life cost and service implications of different levels of maintenance and renewals funding
- The impact of different levels of spending on short-term market capacity/inflation and medium to long-term market development.

This would represent a much more significant shift than the improved practice, clarity and review process already recommended. Achieving this would require a step-change in resourcing and focus for this work, as well as potentially a range of complementary improvements in evidence systems and analysis.

Nevertheless, given the potential to more intelligently inform significant macro-level investment choices, we would recommend Waka Kotahi and the Ministry explore approaches to move closer to price-quality analysis or some pragmatic alternative, informed by models in other New Zealand sectors and overseas transport entities.

4. The sequence of the analysis and advice should be improved to ensure the right factors are considered at the right stage

It appears that at a high-level, the analysis and advisory process supporting GPS activity class setting has not been able to follow a preferred sequence. In general the process has been iterative, but what appears to be missing is the forecasts, analysis of optimal investment, informing either strategic direction setting or revenue setting at the front end.

If the Ministry and Waka Kotahi can improve their ability to demonstrate the service level and whole-of-life cost implications of different levels of investment, this presents the opportunity to structure the analysis, advice and decision making process around activity classes and revenue in a more optimal way.

The specific sequence of how the process should ideally operate requires further consideration, and would need the support of the Minister of the day. Nevertheless, at a high-level the process should resemble the following:

1. Analysis and advice on an optimal level of investment over the GPS period is provided to the Minister.
2. Advice on optimal investment is combined with other factors to inform advice and decisions around strategic direction.
3. Combining strategic direction and officials' views on optimal investment, forecasts prepared under multiple scenarios with service level and whole-of-life cost implications identified
4. This informs a combined activity class and revenue advice and decision making. *E* e

We recommend that the Ministry and Waka Kotahi develop an improved sequence of analysis and advice to better apply forecasting and estimation to decision making. This processes may or may not be precisely aligned with illustrative sequence above.

Opportunities to improve efficiency over time

Through their engagement with suppliers and Waka Kotahi, and informed by their own industry experience, Mott MacDonald has identified a number of opportunities for exploration for Waka Kotahi and the Ministry to improve value for money and performance from NLTF expenditure. A number of these relate to projects and change processes already underway at Waka Kotahi. Identifying these areas was not the primary focus on the review and the areas below should be treated as areas of potential further inquiry, rather than validated conclusions.

Areas of Opportunity:

- The Integrated Delivery Model (IDM) represents an opportunity for improving and growing the pool of suppliers from Tier 1 Contractors and Consultants, across to Tier 2 suppliers' to avoid the current situation of all the NOC contracts being held by only a few suppliers. By widening the pool of potential respondents and engagement of Tier 2 contractors it may lead to increased competition, knowledge sharing, innovation and productivity.
- Reallocating budgets between NOC regions of the same supplier. This would allow targeted prioritisation of budget allocation to address road networks deteriorating faster due to pavement degradation from no renewals being undertaken. By keeping the funding with the same supplier, this would improve productivity and enable efficiencies for Contractors to programme work which is targeted and timed to further sweat assets and extend asset life rather than undertake unnecessary work to spend budgets.
- Funding structure and levels that better account for whole of life cost. For example, additional investment in early stages of projects should be more encouraged so that confidence can be provided to suppliers on visibility of pipeline and forecasting of budgets. This includes for example; better business case processes to fund geotechnical investigations early to better inform design solutions and therefore provide accuracy of cost estimates rather than assigning contingencies that may be overestimated or too conservative. This would avoid costly project overruns (cost, scope, time) downstream from concept work when undertaking the implementation phases.
- Projects recommended for the NLTP should regularly be challenged based on benefits being provided to achieve broader and social outcomes. Oversight is needed across the portfolio of the NLTP to reconsider priority of projects uploaded into TIO and whether projects should be considered for funding through the NLTP based on .
- Review of KRAs such as safety, health of the relationship, delivery, customer, sustainability etc.. to have greater emphasis on outcomes rather than focus on budget allocation. Current practice can sometimes lead to spending allocated budgets once they have been assigned and approved and make the project scope fit the budget. Instead, there should be greater ability for scope with clear benefit outcome to drive budget development.
- Greater linkages between systems and alignment in processes to ensure financial numbers are accurate/updated and able to provide a single point of truth for the NLTP. The number of systems and processes that make up the development of forecasting of figures in the NLTP appears to be disjointed with no clear view of what factors have been applied and therefore could be viewed as conservative.
- With the implementation of the NZ Guide to Temporary Traffic Management efficiencies are likely due to a more flexible application of a code of practice. This Guide is expected to reduce the cost of Temporary Traffic Management and improve efficiencies by taking a risk-based approach to TTM. This is being piloted across a number of NOCs

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Appendicies

KPMG

Activity Class Analysis

State Highway Maintenance (1 / 2)

Overview

The forecast cost within the period is $3,582m, this represents 20% of the overall forecast spend. State highway maintenance involves continuous investment in the upkeep, operations, and renovation of the state highway network to ensure that it offers a suitable level of service for all modes of transportation. This includes promptly and efficiently addressing any transport disruptions to restore the network to its appropriate level of service. The NOC is the predominant contract type employed by Waka Kotahi for state highway maintenance. The NOC utilises an outcome-based approach, focusing on attaining predetermined performance targets for the state highway network.

Key Observations

State highway maintenance forecast breakdown:

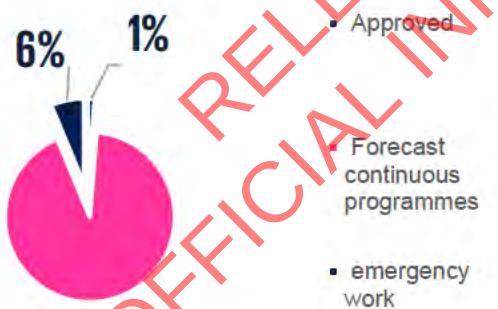
- Approved works: $46m (1%)
- Forecast continuous programmes: $3,311m (93%)
- Emergency works: $225m (6%),

Evolving state highway maintenance forecast:

The state highway maintenance forecast has evolved in recent months and having gone through various iterations we remain unable to source documentation that fully accounts for the inputs to the $3,582m figure.

Impact of current maintenance budgets:

Through enquiry it has been suggested that the current maintenance budgets are posing limitations on the ability to deliver the necessary level of service to maintain the road network and ensure a satisfactory customer experience. These budget constraints have resulted in a reduction in proactive renewals, which involves planned maintenance activities, while reactive surfacing work, which addresses immediate needs, is being prioritised to maintain productivity.



Cost Analysis

The current forecast represents a 25.9% activity class increase on the 2021-24 NLTP.

During our analysis of the movement, we only had a detailed cost breakdown of model 6.7. On average, the movement in each year was attributed to an 82% price adjustment and an 18% output adjustment. The foremost driver of the price increase was the pending NOC contract renewals, while the foremost driver of the output increase was the increase in regional VKT projects.

State Highway Maintenance (2/2)

Category	Basis of Estimate	Level of confidence	Rationale
Approved works	The $46m consists of forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Low to Moderate	• Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costing have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecasted amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Continuous programmes	Continuous programmes forecast has been calculated using the prior year's actuals and applying uplifts to inform the current forecast using a range of indices and adjustments.	Moderate	• A thorough analysis of the prior year's actuals and their alignment with approved amounts in the system has yielded a moderate to ***high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Evaluation of uplifts in the forecasted amounts reveals a ***low to moderate level*** of confidence for the indices and adjustments. This is due to various factors introducing uncertainty and potential fluctuations in the forecasted values. • Considering these findings, a ***moderate confidence level*** is assigned to the forecasted amounts for the continuous programs. While the prior year amounts are more certain, the identified uncertainties in the uplifts contribute to an overall moderate confidence level for the continuous programs.
Emergency works	Emergency works costs have been calculated by taking the costs from the previous year and applying the CPI.	Low to Moderate	• Historical data provides a ***moderate level*** of confidence in this allocation, considering past emergency work requirements. • However, the potential impact of increasing extreme weather conditions introduces uncertainty. These conditions may result in a higher volume of future emergency work, necessitating a reassessment of the allocation's adequacy. • Given the inherent uncertainty associated with future extreme weather events and their potential impact on emergency work requirements, the confidence level in the forecasted allocation is reduced. • Taking these factors into account, a ***low to moderate level*** of confidence is assigned to the forecasted allocation for Emergency Works, recognising the need for further evaluation and potential adjustments.

Local road maintenance (1 of 2)

Overview

The forecast cost within the period is $2,982m, this represents 17% of the overall forecast spend for the 2024-27 period. Local road maintenance involves continuous investment in the maintenance, operations, and renewal of the local road network, with the aim of providing an adequate level of service for all modes of transportation. It also includes timely and effective responses to transport disruptions in order to restore the network to its appropriate level of service.

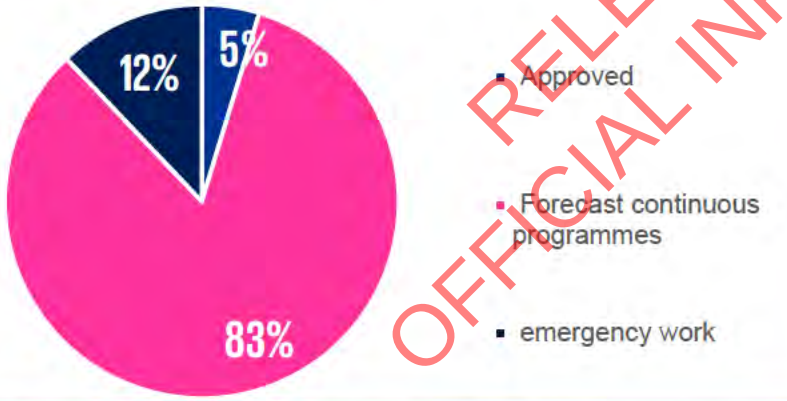
Key Observations

Local road maintenance forecast breakdown:

- Approved works: $141m (5%)
- Forecast continuous programmes: $2,481m (83%)
- Emergency works: $360m (12%)

Impact of weather conditions and covid restrictions:

Weather conditions and COVID restrictions in the past three years have significantly impacted productivity. As a result, 17% of the pavement on the Auckland road network is classified as poor to very poor, and 24% are in moderate condition. This highlights the need for increased investment in local road maintenance to improve the condition, safety, and quality of the road network.



Cost Analysis

The current forecast represents a 23% activity class increase on the 2021-24 NLTP.

During our analysis of the movement, we only had a detailed cost breakdown of model 6.7, which accounted for 95% of the forecast. On average, the movement in each year was attributed to an 86% price adjustment and a 14% output adjustment. The foremost driver of the price increase was the pending NOC contract renewals, while the foremost driver of the output increase was the increase in regional VKT projects.

Local road maintenance (2 of 2)

Category	Basis of estimate	Level of confidence	Level of confidence
Approved works	Of the total $141m, $23m consists of existing commitments that have been approved and are reflected in the TIO system. The remaining $118m includes forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Low to moderate	• Existing approved commitments: A thorough analysis of the amounts and their alignment with approved amounts in the system has yielded a ***moderate to a high level*** of confidence for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costings have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecast amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Continuous programmes	Continuous programmes forecast has been calculated using the prior year's actuals and applying uplifts to inform the current forecast using a range of indices and adjustments.	Moderate	• A thorough analysis of the prior year's actuals and their alignment with approved amounts in the system has yielded a ***moderate to high*** level of confidence for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Evaluation of uplifts in the forecasted amounts reveals a ***low to moderate level*** of confidence for the indices and adjustments. This is due to various factors introducing uncertainty and potential fluctuations in the forecasted values. • Considering these findings, a ***moderate confidence level*** is assigned to the forecasted amounts for the continuous programs. While the prior year amounts are more certain, the identified uncertainties in the uplifts contribute to an overall moderate confidence level for the continuous programs.
Emergency works	Emergency works costs have been calculated by taking the costs from the previous year and applying the CPI.	Low to Moderate	• Historical data provides a ***moderate level*** of confidence in this allocation, considering past emergency work requirements. • However, the potential impact of increasing extreme weather conditions introduces uncertainty. These conditions may result in a higher volume of future emergency work, necessitating a reassessment of the allocation's adequacy. • Given the inherent uncertainty associated with future extreme weather events and their potential impact on emergency work requirements, the confidence level in the forecasted allocation is reduced. • Taking these factors into account, a ***low to moderate level*** of confidence is assigned to the forecasted allocation for Emergency Works, recognising the need for further evaluation and potential adjustments.

Public Transport Services (1 of 2)

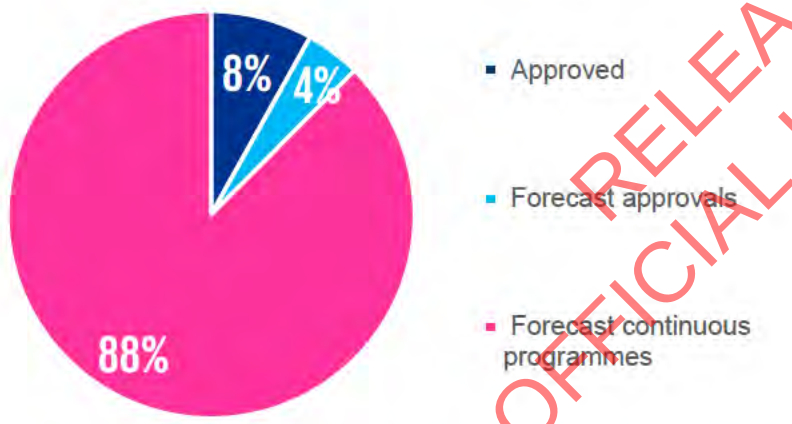
Overview

The forecast cost within the period is $2,271m, this represents 13% of the overall forecast spend for the 2024-27 period. Public transport services refer to both the investment in the operation and maintenance of existing public transport networks to improve their utilisation and/or maintain their level of service, as well as the investment in new public transport services to improve the level of service and support an increase in the uptake of public transport.

Key Observations

Public transport services (NZTA share) breakdown:

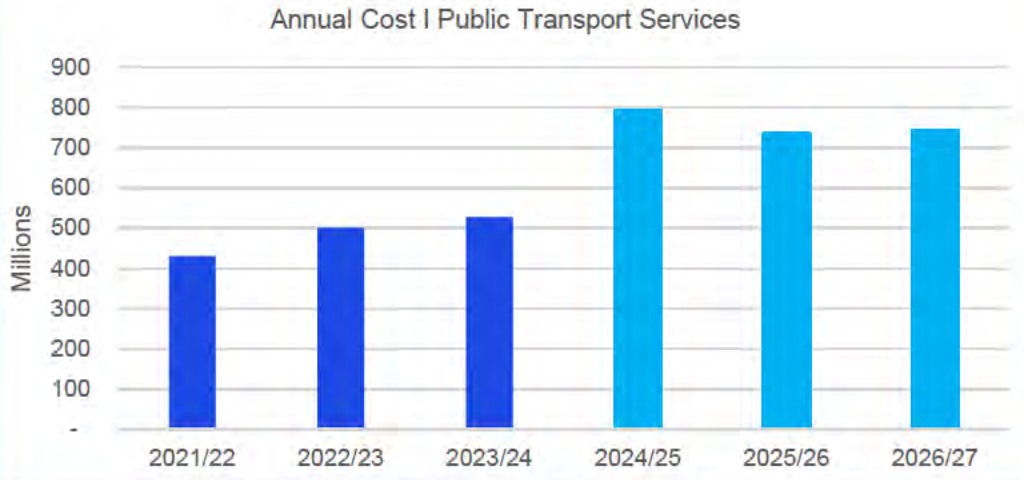
- Approved works: $184m (8%)
- Forecast approvals: $99m (4%)
- Forecast continuous programmes: $1,988m (88%)



Cost Analysis

The current forecast represents a 23% activity class increase on the 2021-24 NLTP.

During our analysis of the movement, we only had a detailed cost breakdown of model 6.7, which accounted for 79% of the forecast. Upon analysing this breakdown, we ascertained that 81% of the movement is attributed to prior year amounts, adjusted for a 5% price increase, a 4% output increase, a 6% increase in labour costs, and a 3% increase in decarbonisation costs. The primary drivers of the increased public transportation costs are the volume of services, fare box policies, labour costs, and the cost of transitioning to battery electric vehicles (BEV) with supporting infrastructure.



Public Transport Services (2 of 2)

Category	Basis of Estimate	Level of confidence	Rationale
Approved works	Of the total $184m, $157m consists of existing commitments that have been approved and are reflected in the TIO system. The remaining $27m includes forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Moderate	• Existing commitments: A thorough analysis of the amounts and their alignment with approved amounts in the system has yielded a **moderate to a *high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costing have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecast amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence
Forecast approvals (probable amounts that are expected to be included for funding approvals in this NLTP)	Evidence for cost estimation may vary based on the project phase and source of information.	Low to Moderate	• Similar to previous forecasted approvals, the level of evidence supporting these probabilities can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Continuous programmes	The forecast for the continuous programme has been determined by analysing the actuals from the previous year and applying uplifts, utilising various indices and adjustments. The calculated output was then multiplied by 51%, representing Waka Kotahi's share of the funding in the NLTP.	Moderate	• A thorough analysis of the prior year's actuals and their alignment with approved amounts in the system has yielded a moderate to ***high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • The evaluation of uplifts in the forecasted amounts reveals a moderate level of confidence, as various factors introduce uncertainty and the potential for fluctuations in the values. Particularly, there are uncertainties regarding fare box policies and the required rate of service growth for mode shifts. However, the confidence level is not considered low due to the inclusion of factors in the latest forecast that directly impacts the estimate, such as the decarbonisation initiative and driver wage increases. • Consequently, the level of confidence in the forecast is considered ***moderate***, acknowledging the presence of uncertainties associated with uplifts and cost estimation.

Road to Zero (1 of 2)

Overview

The forecast cost within the period is $2,880m, this represents 16% of the overall forecast spend for the 2024-27 period. This activity class is an investment strategy focused on improving road safety through measures such as safety infrastructure, speed management, road policing, automated enforcement, and promoting behavioural changes for road safety outcomes.

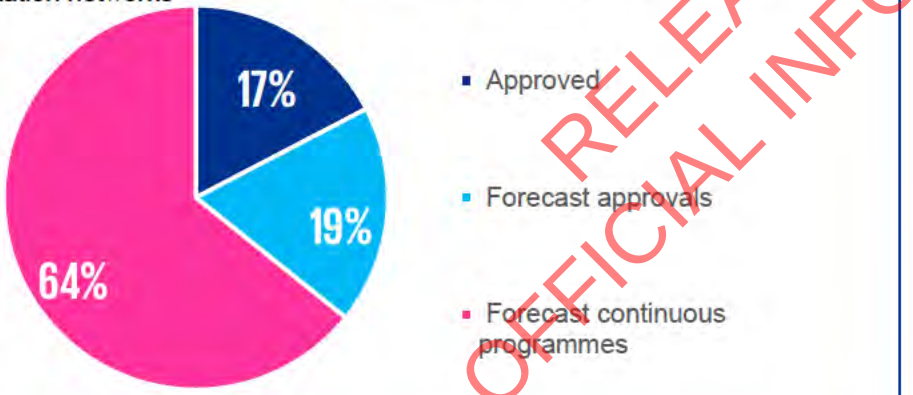
Key Observations

Rod to zero breakdown:

- Approved works: $500m (17%)
- Forecast approvals: $530m (19%)
- Forecast continuous programmes: $1,850m (64%)

Integration of new safety policies enhancing road safety standards and functionality drives increased costs

We have observed the implementation of new safety policies aimed at improving road safety, which has led to increased costs in delivery. These policies are designed to enhance the standards and functionality of road corridors, ensuring safer and more efficient transportation networks



Cost Analysis

The current forecast reflects a 10% activity class increase from the 2021-24 NLTP.

The forecasts rely solely on figures provided by Waka Kotahi and Council, with minimal adjustments made to account for inflation. It is worth noting that the movement is not a result of comparing the same activities between time periods, and therefore, it is not possible to attribute the movements to factors such as price and output.

Road to Zero (2of 2)

Category	Basis of estimate	Level of confidence	Rationale
Approved works	Of the total $500m, $122m consists of existing commitments that have been approved and are reflected in the TIO system. The remaining $378m includes forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Moderate	• Existing commitments: A thorough analysis of the amounts and their alignment with approved amounts in the system has yielded a **moderate to a *high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costing have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecast amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Forecast approvals (probable amounts that are expected to be included for funding approvals in this NLTP)	Evidence for cost estimation may vary based on the project phase and source of information.	Low to moderate	• These numbers are based on probable amounts, and the level of evidence supporting these forecast amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence. • The completion of the Councils' Long-Term Plan (LTP), Regional Land Transport Plan (RLTP), and Annual Plan consultations is crucial in determining the scale of Council programs and the corresponding funding demand for GPS 2024. The current stage of these consultations introduces significant uncertainty. However, it is noteworthy that a higher proportion of projects have business case support compared to those relying solely on Council-provided costs, which provides a degree of confidence in the estimates.
Continuous programmes	Detailed estimates have not been sighted however Waka Kotahi has provided an extract from the road policing programme agreed upon by Ministers.	Moderate	• Detailed estimates for continuous programs have not been obtained. • However, an extract from the road policing program, which has been agreed upon by Ministers, has been provided by Waka Kotahi. • Ministerial approval indicates a higher level of scrutiny and endorsement for the program. • Despite the absence of detailed estimates, the involvement of Waka Kotahi NZTA and the Ministerial approval contribute to a ***moderate level*** of confidence in the continuous programmes.

Public Transport Infrastructure (1 of 2)

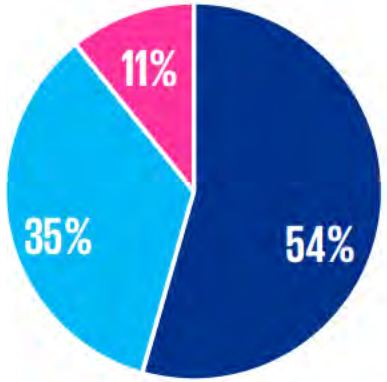
Overview

The forecast cost within the period is $1,845m, this represents 10% of the overall forecast spend for the 2024-27 period. This activity class refers to investments made in the maintenance, renewal, and improvement of existing infrastructure, as well as the development of new infrastructure, aimed at enhancing the utilisation and level of service of public transportation systems.

Key Observations

Public transport infrastructure breakdown:

- Approved works: $1,004m (54%)
- Forecast approvals: $642m (35%)
- Forecast continuous programmes: $199m (11%)

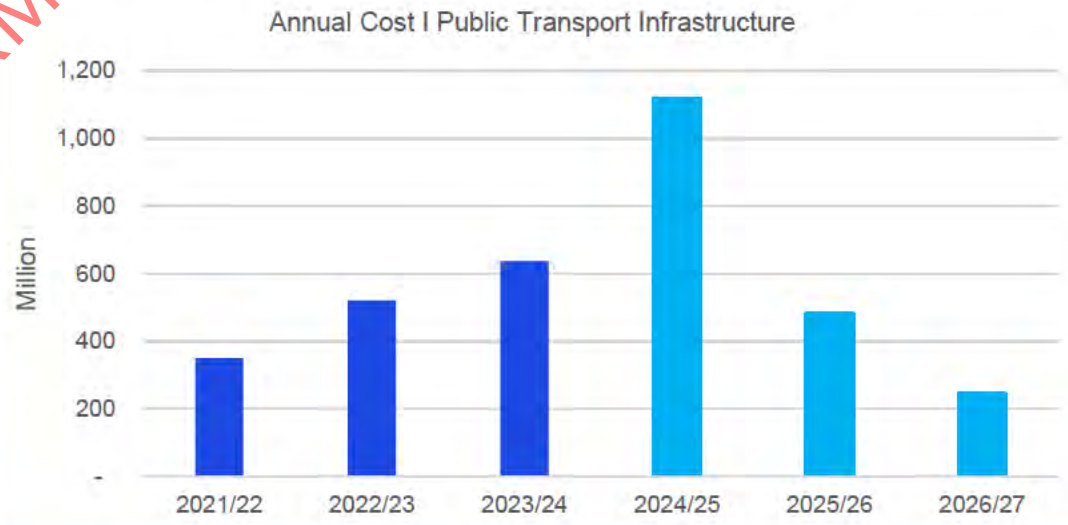


- Approved
- Forecast approvals
- Forecast continuous programmes

Cost Analysis

The current forecast reflects a 22.3% activity class increase from the 2021-24 NLTP.

The forecasts rely solely on figures provided by Waka Kotahi and Councils, with minimal adjustments made to account for the current 30-year high inflation. It is worth noting that the movement is not a result of comparing the same activities between time periods, and therefore, it is not possible to attribute the movements to factors such as price and output.



Public Transport Infrastructure (2 of 2)

Category	Basis of estimate	Level of confidence	Rationale
Approved works	Of the total $1,004m, $616m consists of existing commitments that have been approved and are reflected in the TIO system. The remaining $388m includes forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Moderate	• Existing commitments: A thorough analysis of the amounts and their alignment with approved amounts in the system has yielded a **moderate to a *high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costing have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecast amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Forecast approvals (probable amounts that are expected to be included for funding approvals in this NLTP)	Evidence for cost estimation may vary based on the project phase and source of information.	Low to moderate	• Similar to previous forecasted approvals, the level of evidence supporting these probabilities can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Continuous programmes	The Continuous Program team forecasts these costs by using the public transport plan as a base and adjusting the amount based on a range of indices and factors to estimate the costs for the next NLTP.	Moderate	• We have sighted the public transport plan, with this providing a high ***to moderate level*** of confidence over the base forecast. • Evaluation of uplifts in the forecasted amounts reveals a ***low to moderate level*** of confidence for the indices and adjustments. This is due to various factors introducing uncertainty and potential fluctuations in the forecasted values. • Considering these findings, a ***moderate confidence level*** is assigned to the forecasted amounts for the continuous programs. While the prior year amounts are more certain, the identified uncertainties in the uplifts contribute to an overall moderate confidence level for the continuous programs.

State highway improvements (1 of 2)

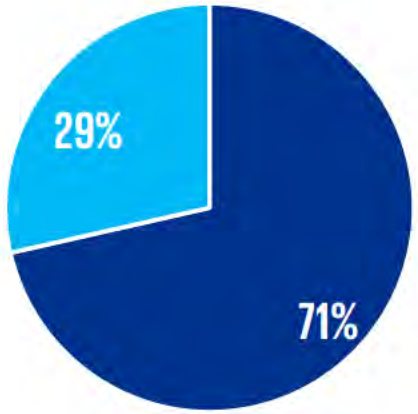
Overview

The forecast costs within the period is $1,016m, this represents 6% of the overall forecast spend for the 2024-27 period. It encompasses investments aimed at optimising utilisation and enhancing levels of services across all modes on the state highway network.

Key Observations

State highway improvement breakdown:

- Approved works: $726m (71%)
- Forecast approvals: $290m (29%)



Cost Analysis

The current forecast reflects a 64.7% activity class decrease from the 2021-24 NLTP.

The forecasts rely solely on figures provided by Waka Kotahi and Council, with minimal adjustments made to account for the current 30-year high inflation. It is worth noting that the movement is not a result of comparing the same activities between time periods, and therefore, it is not possible to attribute the movements to factors such as price and output.

State highway improvements (2 of 2)

Category	Basis of estimate	Level of confidence	Ratioanle
Approved works	Of the total $726m, $438m consists of existing commitments that have been approved and are reflected in the TIO system. The remaining $3285m includes forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Moderate	• Existing commitments: A thorough analysis of the amounts and their alignment with approved amounts in the system has yielded a **moderate to a *high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costing have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecast amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Forecast approvals (probable amounts that are expected to be included for funding approvals in this NLTP)	Evidence for cost estimation may vary based on the project phase and source of information.	Low to moderate	• Similar to previous forecasted approvals, the level of evidence supporting these probabilities can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.

Local road improvements (1 of 2)

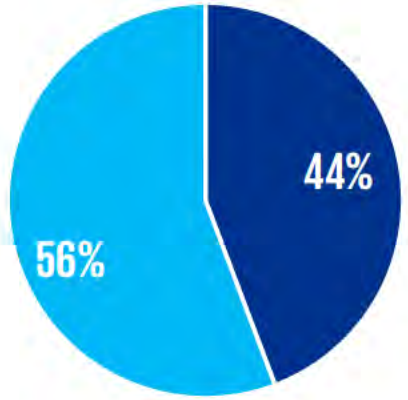
Overview

The forecast cost within the period is $558m, this represents 3% of the overall forecast spend for the 2024-27 period. It encompasses investments aimed at optimising utilisation and enhancing levels of services across all modes on the local road network.

Key Observations

Local road improvement breakdown:

- Approved works: $247m (44%)
- Forecast approvals: $311m (56%)



Cost Analysis

The current forecast reflects a 14% activity class increase from the 2021-24 NLTP.

The forecasts rely solely on figures provided by Waka Kotahi and Councils, with minimal adjustments made to account for the current 30-year high inflation. It is worth noting that the movement is not a result of comparing the same activities between time periods, and therefore, it is not possible to attribute the movements to factors such as price and output.

Local road improvements (2 of 2)

Category	Basis of estimate	Level of confidence	Rationale
Approved works	Of the total $247m, $135m consists of existing commitments that have been approved and are reflected in the TIO system. The remaining $112m includes forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Moderate	• Existing commitments: A thorough analysis of the amounts and their alignment with approved amounts in the system has yielded a **moderate to a *high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costing have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecast amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Forecast approvals (probable amounts that are expected to be included for funding approvals in this NLTP)	Evidence for cost estimation may vary based on the project phase and source of information.	Low to Moderate	• Similar to previous forecasted approvals, the level of evidence supporting these probabilities can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.

Walking and cycling (1 of 2)

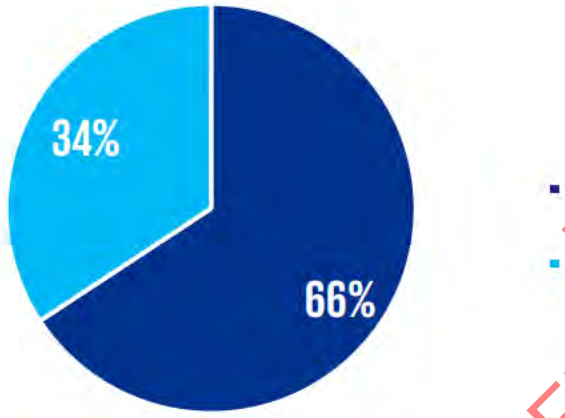
Overview

The forecast cost within the period is $508m, this represents 3% of the overall forecast spend for the 2024-27 period. It encompasses investments aimed at improving the level of service and promoting increased participation in walking and cycling, including micro-mobility options.

Key Observations

Local road improvement breakdown:

- Approved works: $334m (66%)
- Forecast approvals: $174m (34%)



Cost Analysis

The current forecast reflects a 12% activity class decrease from the 2021-24 NLTP.

The forecasts rely solely on figures provided by Waka Kotahi and Councils, with minimal adjustments made to account for inflation. It is worth noting that the movement is not a result of comparing the same activities between time periods, and therefore, it is not possible to attribute the movements to factors such as price and output.

Walking and cycling (2 of 2)

Category	Basis of estimate	Level of confidence	Rationale
Approved works	Of the total $334m, $139m consists of existing commitments that have been approved and are reflected in the TIO system. The remaining $216m includes forecasted carry-forward commitments from 2021 to 2024 (i.e. previous NLTP approved and forecasted approvals).	Moderate	• Existing commitments: A thorough analysis of the amounts and their alignment with approved amounts in the system has yielded a **moderate to a *high level of confidence*** for the prior year's figures. This analysis provides confidence in the accuracy and reliability of the data. • Previous NLTP approvals: The use of approved amounts instils confidence in the accuracy and reliability of the allocation. However, it should be noted that this category comprises older approvals, and adjustments may be necessary if the forecast exceeds the funding approval in the current NLTP. Conversations with Waka Kotahi have revealed that some adjustments may not have been reflected yet. As costing have not been substantiated with recent reporting / updated forecasts this instils a ***low to moderate level*** of confidence due to underlying data uncertainty and potential adjustments. • Previous forecasted approvals: These numbers are based on probable amounts, and the level of evidence supporting these forecasted amounts can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence.
Forecast approvals (probable amounts that are expected to be included for funding approvals in this NLTP)	Evidence for cost estimation may vary based on the project phase and source of information.	Low to Moderate	• Similar to previous forecasted approvals, the level of evidence supporting these probabilities can vary. This evidence includes completed business cases with supporting cost estimates consistent with the Waka Kotahi cost estimation manual, business cases with non-formal peer review, or costs provided by Councils without a robust, cost estimate available. Consequently, the level of certainty and confidence can vary, resulting in a ***low to moderate level*** of confidence

MoT inclusion (1)

Overview

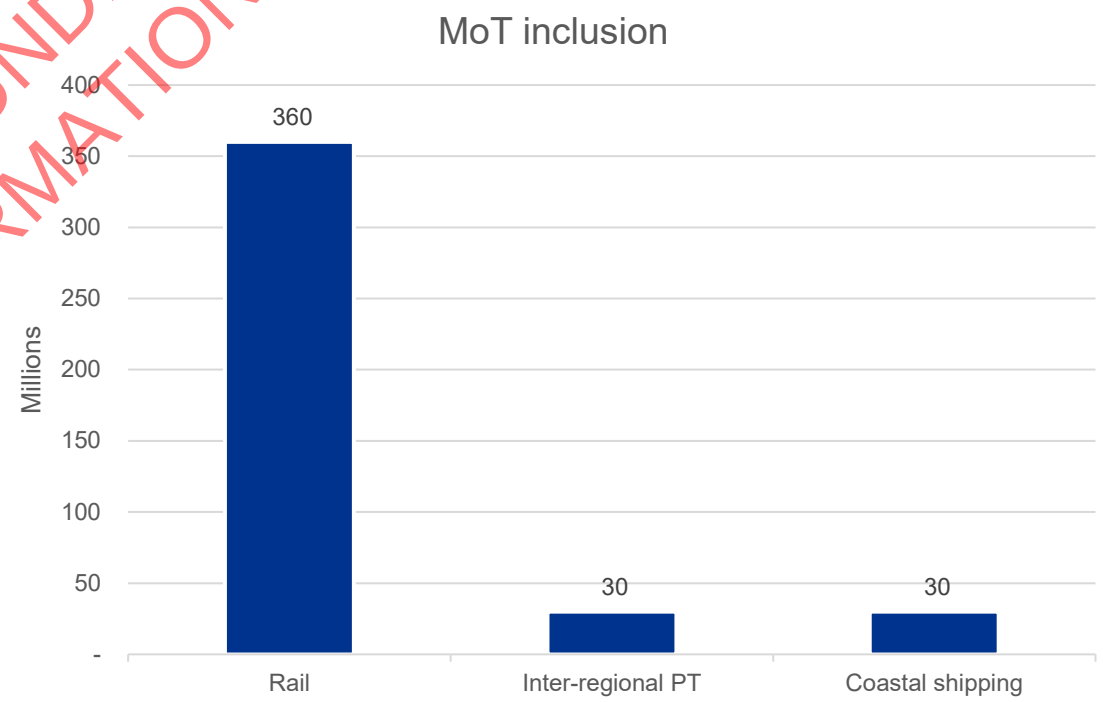
The forecast cost within the period is $435m, this represents 2% of the overall forecast spend for the 2024-27 period. It consists of the following three activity classes:

- Coastal Shipping: Investment in coastal shipping aims to enhance the efficiency and sustainability of the coastal shipping sector while achieving decarbonisation and safety objectives.
- Rail Network: Investment in a reliable and resilient national rail network. Including enabling KiwiRail to deliver ongoing maintenance, renewals and improvements to the rail network.
- Inter-regional Public Transport: Inter-regional public transport involves investment to support the delivery and operations of both new and existing inter-regional transport services. This includes funding for planning activities such as developing investment frameworks, principles, and business cases, as well as supporting pilot schemes to improve inter-regional connectivity and accessibility.

MoT inclusions

The below activity classes were derived by MoT and we were advised that these values were determined as follows:

- **Rail -** Waka Kotahi did not provide any estimates for the Rail AC within Model 6.7 or other forecasts. The $360m (or $120m per year) is carry over of the lower funding range from GPS 21.
- **Coastal Shipping and Inter regional rail** – Included at the request of the minister, The draft GPS document outlines their intent and purpose



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Indices analysis

1. Indices and adjustments (1 of 3)

Overview

The prior year's forecasted amount was adjusted using a combination of indices and adjustments, with the adjustments illustrated in the table below. These adjustments were implemented to capture the market fluctuations. They are the key factors determining the level of change in the continuous programmes under the modelling approach. In the following table, we evaluated the level of confidence and provided the rationale for each adjustment.

Adjustments	Percentage	Explanation provided from Waka Kotahi for adjustment	Level of confidence	Rationale
Relationship Between Urban Road Growth and Population Growth in New Zealand.	25%	By analysing New Zealand Transport Agency (NZTA) data on urban road length and Stats NZ's population figures, Waka Kotahi observed that urban roads grew by 11% from 2009/10 to 2020/21, while the population grew by 18% during the same period. This suggests a proportional relationship of 0.6 between urban road growth and population growth. Considering that urban roads constitute 20% of the total road network, Waka Kotahi calculated the gross growth rate for New Zealand as 0.6 multiplied by 0.2, resulting in 0.12. However, for the sake of simplification, Waka Kotahi applied these numbers specifically to urban councils, assuming that they are the ones experiencing growth. Waka Kotahi conservatively estimated a growth rate of 0.25, which is considerably lower than the 0.6 population change rate.	Low to Moderate	The confidence level of ***low to moderate*** for the 25% increase estimation is based on several factors. • The analysis conducted by Waka Kotahi, using NZTA data and population figures from Stats NZ, indicated a proportional relationship between urban road growth and population growth. • However, the simplifications made in the analysis, such as assuming growth only in urban councils, may not capture the full complexities of road development and population dynamics. • Additionally, the conservative estimation of a 25% growth rate may not account for all relevant factors influencing road growth. • To enhance confidence in the estimation, more comprehensive data and a thorough analysis considering regional variations and other influencing factors are required.
Maintenance index	1.3%	The adjustment pertains to forecasting inflation for road maintenance.	Low to Moderate	The confidence level of ***low to moderate*** for the 1.3% maintenance index adjustment is based on several reasons. • Firstly, there has been a lack of official forecasts specifically for transport indexes until recently. • Secondly, although Infometrics now provides transport indexes, they are new and untested as a result their reliability and accuracy has not been determined. This may introduce uncertainty into the estimation. • To address the lack of specific forecasts, Waka Kotahi has used historical comparisons between CPI forecasts and Infometrics. While this approach provides valuable insights, it's important to acknowledge that past relative movements may not necessarily align with future movements. • Economic conditions and various factors can change over time, leading to divergent trends between the CPI and construction indexes.

1. Indices and adjustments (2 of 3)

Continued

Adjustments	Percentage	Explanation provided from Waka Kotahi for adjustment	Level of confidence	Rationale
Market impact of estimated cost when a NOC contract renews	130%	This was drawn from recent tender awards, with increases related to issues identified with the existing NOC contracts (i.e. previous underbidding).	Low to Moderate	The ***low to moderate level*** of confidence in the adjustment is primarily driven by the prevailing uncertainties surrounding the NOC renewals.
Efficiency gain	0%	Waka Kotahi had set a target of achieving a 2% annual reduction in costs back in 2012. However, they were only able to meet this target for a limited period of time. Due to various uncertainties (i.e., cost escalation and NOC contract renewals), achieving the same level of cost reduction has become more challenging.	Low to Moderate	The ***low to moderate level*** of confidence in the efficiency gain is primarily driven by the prevailing uncertainties. Several factors contribute to this uncertainty, including the complexity of the projects, potential changes in resource availability, and the evolving nature of the industry. Additionally, external factors such as market conditions, regulatory changes, and unexpected events can significantly impact cost efficiencies.
Average annual growth rate of public transportation contract renewals or extensions during negotiation	103%	No explanation was provided.	Low to Moderate	The ***low to moderate level*** of confidence for assuming a 3% annual increase in contract prices is based on several factors. • One of the main reasons is the dynamic nature of contract prices, which can be influenced by various factors such as labour costs, legislative changes, and project-specific requirements. • Additionally, the introduction of the Public Transport Operating Model (PTOM) adds complexity and uncertainty to contract prices in the public transport sector. • Another contributing factor is the limited number of recent contract renewals and upcoming tenders in major cities, making it challenging to assess the market dynamics accurately.

1. Indices and adjustments (3 of 3)

Continued

Adjustments	Percentage	Explanation provided from Waka Kotahi for adjustment	Level of confidence	Rationale
State highway network complexity index	101%	Waka Kotahi made reference to the State Highway Activity Management Plan (SHAMP), although no further specific information or details were provided.	Low to Moderate	Despite referring to the SHAMP as a source, no concrete evidence was found to support the suggested 1% increase. As a result, there exists a lack of substantial support for the validity and reliability of the indices, leading to a ***low to moderate*** level of confidence in their accuracy.
State highway size increase	10%	According to the SHAMP, state highway complexity reflects the challenges posed by the expanding size and intricacy of the network. These challenges stem from the substantial improvement initiatives undertaken and the integration of local roads into the state highway network.	Low to Moderate	Despite referring to the SHAMP as a source, no concrete evidence was found to support the suggested 10% increase. As a result, there exists a lack of substantial support for the validity and reliability of the indices, leading to a ***low to moderate*** level of confidence in their accuracy.

In addition to the adjustments outlined earlier, various official sources such as the Ministry of Business, Innovation and Employment, Statistics New Zealand, and the Ministry of Transport were used to develop other projections and indices, including employment projects, consumer price index, VKT projections, and others. These official sources were considered to be reliable and based on historic data, which helped to reduce the level of estimation and judgement required in the analysis.

The use of these official sources added a ***moderate to a high level*** of confidence to these projections and indices.

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Evidence reviewed

Evidence Reviewed

Title	Source
Infrastructure Australia Market Capacity Report (December 2022)	2022 Infrastructure Market Capacity report | Infrastructure Australia
BDO Construction Sector report (2023)	Construction Report | BDO New Zealand
Changes Ahead – Feature Section (The National Construction Pipeline Report) (Oct/Nov 2018)	https://www.buildmagazine.org.nz/
Building and Construction Sector Trends MBIE – Annual Report (October 2022)	https://www.mbie.govt.nz/
Cabinet Paper – Action Plan to deliver the Construction Skills Strategy (2018)	https://www.msd.govt.nz/
EBOSS Construction Industry Confidence (August 2022)	https://www.eboss.co.nz/detailed/building-industry-insight/2022-construction-industry-confidence-report
National Construction Pipeline Report (July 2022)	https://www.mbie.govt.nz/
Rautaki Hanganga o Aotearoa - New Zealand Infrastructure Strategy - 2022 – 2052 (2022)	https://strategy.tewaihanga.govt.nz/strategy
NZ Infrastructure Commission – Sector State of Play: Transport – Discussion Document (May 2021)	https://www.tewaihanga.govt.nz/
Market Sentiment Survey (February – March 2022)	https://www.constructors.com.au/wp-content/uploads/2022/06/Market-Sentiment-Survey-Results-2022_FINAL-V3-3.pdf
Structural Steel Industry Update – March 2023	https://scnz.org/wp-content/uploads/2023/03/SCNZ-IU-Mar-23.pdf

Title	Source
Global Infrastructure Hub Article – Inflation drives up infrastructure delivery costs (22 Jun 2022)	As inflation drives up infrastructure delivery costs, consider these mitigations for existing and new contracts (gihub.org)
EBOSS Q1 2023 Construction Supply Chain Report	Q1 2023 Construction Supply Chain Report – EBOSS
MBIE Building and Construction Sector Trends Biannual Snapshot: May 2022	https://www.mbie.govt.nz/
Case study: Construction industry and migration (Dr Aaron Schiff May 2022)	https://www.productivity.govt.nz/assets/Documents/Case-study_Construction-and-migration.pdf
Infrastructure Quarterly (November 2022)	https://www.tewaihanga.govt.nz
The lay of the land: Benchmarking New Zealand's infrastructure delivery costs (December 2022)	https://www.tewaihanga.govt.nz
Ministry of Transport Government transport portfolio	Ministry of Transport
Range of correspondence from Waka Kotahi	Email
Cordell Construction Cost Index Building Indices – Quarter One 2023	https://www.corelogic.co.nz
Infrastructure Consenting for Climate Targets	https://www.tewaihanga.govt.nz/
Benchmarking New Zealand's infrastructure delivery costs – Te Waihanga Research Insights series (December 2022)	https://www.tewaihanga.govt.nz/

Evidence Reviewed

Title	Source
National Land Transport Fund annual reports	https://www.nzta.govt.nz/
Cross Valley Transport Connections Programme Business Case	Cardno
Waka Kotahi NLTP Walking and Cycling scenario model variables (2021 – 2024)	Waka Kotahi
Waka Kotahi NLTP Public Transport Infrastructure scenario model variables (2021 – 2024)	Waka Kotahi
Waka Kotahi NLTP Local Road Improvements scenario model variables (2021 – 2024)	Waka Kotahi
Waka Kotahi NLTP State Highway Improvements scenario model variables (2021 – 2024)	Waka Kotahi
Waka Kotahi NLTP RtZ scenario model variables (2021 – 2024)	Waka Kotahi
Waka Kotahi National Land Transport Programme (2015 – 2018)	https://www.nzta.govt.nz/
Waka Kotahi State Highway Activity Management Plan	https://www.nzta.govt.nz/
MoT Government Policy Statement on Land Transport 2024/25 – 2033/34	https://www.transport.govt.nz/
MoT Forecast NLTF funding gap over 2024 – 2027 (Published 2023)	Ministry of Transport
Christchurch City Council's Transport System – Programme Case Cluster 6	Christchurch City Council
Shaping Future Dunedin Transport Programme Business Case	Stantec
Connected Communities - New North Road (Corridor) cost estimates	Waka Kotahi
Lake Road Detailed Business Case	Beca Limited
National Ticketing Solution Detailed Business Case	Waka Kotahi

Title	Source
Waka Kotahi Base cases	Ministry of Transport
Joint report: Land Transport Revenue Review: Interim Report	Ministry of Transport, Waka Kotahi, The Treasury
Joint report: Land Transport Revenue Review: Final Report	Ministry of Transport, Waka Kotahi, The Treasury
MoT Model V6.7	Ministry of Transport
Activity Class Options	Ministry of Transport
MoT Activity Class range scenarios	Ministry of Transport
Maintenance and Operations – Integrated Delivery Contract	Waka Kotahi
NOC review update – Three-year Enterprise Operating Model Implementation Strategy	Waka Kotahi
NOC and KPI score summaries	Waka Kotahi
Revised Draft costings for integrated Corridors	Waka Kotahi
Cost and Cashflow Profile – Integrated Corridors	Waka Kotahi
Auckland Metro Train Capacity – Cost Estimates and Business Cases	Waka Kotahi
Concept Design report	Stronger Christchurch- Infrastructure Rebuild Team
Lets Get Wellington Moving: Golden Mile Option V3A	WTP NZ Infrastructure Limited
Auckland Transport Puhinui Interchange Detailed Design Estimate and Business Case	True-Cost

Evidence Reviewed

Title	Source
Beltway Cycleway Economic Evaluation	Beca Limited
Mangere Cycling Scheme – Business Case Estimate	True Cost
Dunedin Tunnels Trail – Business Case Estimate	Waka Kotahi
New Plymouth Tate Road to Waitara – Business Case Estimate	Waka Kotahi
RiverLink – Hutt City CBD Active Mode Improvements Economics Assessment Report	SPA Consulting
Standard Safety Interventions Funding Application	Waka Kotahi
Access Kenepuru Single Stage Business Case	Waka Kotahi
Wellesley Street Bus Improvements – Detailed Business Case	Jacobs Consulting
Historical GPS Ranges	Waka Kotahi

Organisations that participated in interviews
Waka Kotahi (several officials, but not including senior leadership
Auckland Transport
Downer
Fulton Hogan
HEB
Higgins
Department of Internal Affairs
Local Government Finance Agency
Taituarā – Local Government Professionals Aotearoa
Te Waihanga – Infrastructure Commission

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