TE MANATŪ WAKA
MINISTRY OF TRANSPORT

Government Policy Statement on land transport (GPS) 2018 Evaluation

Tauāki Tikanga Here Kāwanatanga mō te arotake waka whenua (GPS) 2018

February 2023

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For more information

For more information about this project and the associated report, please contact: evaluation@transport.govt.nz

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Research, Economics and Evaluation

The Research, Economics and Evaluation team operates within the System Performance and Governance Group of the Ministry of Transport. The team supports the Ministry's policy teams by providing the evidence base at each policy development stage.

The team is responsible for the following:

- Providing sector direction on establishing and using the Transport Evidence Base (see below) – including the collection, use, and sharing of data, research and analytics across the transport sector and fostering the development of sector research capabilities and ideas.
- Leading and undertaking economic analyses, appraisals and assessments, including providing economic input on business cases and funding requests.
- Performing the evaluation function for the Ministry, including designing monitoring and evaluation frameworks and approaches, developing performance metrics and indicators, and designing, conducting and procuring evaluations.

The Transport Evidence Base

The Transport Evidence Base Strategy creates an environment to ensure data, information, research and evaluation play a key role in shaping the policy landscape. Good, evidence based decisions also enhance the delivery of services provided by the public and private sectors to support the delivery of transport outcomes and improve wellbeing and liveability in New Zealand.

The GPS Evaluation is listed on the 2021/22 Evaluation Programme, which forms part of the Transport Evidence Base implementation plan.

Evaluation Team

The evaluation team were Adrian Field (project lead), Aaron Schiff (data science), Michael Blewden (qualitative research), Julian King (evaluation design and methods review), Hamish Mackie (peer review), Adela Wypych (data science) and Georgia Parslow (project support).

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- Judy Li and Vienna Yang of Te Manatū Waka, who provided stewardship and oversight of the evaluation
- Heather Benwood and Jacob Boyes of Waka Kotahi in facilitating investment data access
- All interviewees and workshop participants from Waka Kotahi and other interested organisations, who informed all stages of the evaluation process.

1 Executive Summary

1.1 Introduction

Te Manatū Waka (Ministry of Transport) commissioned a multidisciplinary team, led by Dovetail Consulting Ltd, to evaluate the 2018 Government Policy Statement on land transport (GPS 2018). The evaluation's purpose is to improve understanding of whether and to what extent GPS 2018 investments (ie, those fully or partially funded by the National Land Transport Fund/ NLTF) have achieved their intended results over the three years 2018/19-2020/21.

Two key evaluation questions (KEQs) guide this work:

1 To what extent has GPS 2018 influenced changes in NLTF investments, implementation, and early stage outcomes?

2 What key factors affect the efficiency and effectiveness of converting inputs to outputs and outcomes?

Although initially commissioned as an outcome evaluation, the long term nature of GPS influence means it is not feasible to seek to attribute outcomes such as road safety, transport mode shift and emissions reductions in the short 2018-2021 period. Therefore, this evaluation is more process focused, emphasising examining the influence or alignment of GPS 2018 on transport investment decision making and planning during 2018-21.

1.2 Methods

1.2.1 Evaluation criteria

To address KEQ 1, evaluation criteria (Table 1) were defined that align with GPS 2018 short term results and final reporting measures established by Te Manatū Waka for GPS 2018, reflecting the key priorities of safety, access, environment, and value for money.[1] These criteria were systematically addressed using quantitative and qualitative evidence (investment data analysis, and key informant interviews, as summarised below). Our analysis focuses on criteria with adequate confidence in the evidence. It excludes criteria where the evidence is inadequate to support a judgement or where no evidence is available. KEQ 2 was addressed qualitatively.

1.2.2 Investment data analysis

Detailed data from Waka Kotahi on transport activities in National Land Transport Programmes (NLTPs) was matched to data on funding approvals to analyse and compare funding decisions made under GPS 2018 with those made under GPS 2015 and 2012. This analysis focuses on funding decisions rather than actual expenditure, which may differ, to examine the extent to which the policy directions in GPS 2018 were associated with a change in the mix of funding decisions.

Actual expenditure while a GPS is in effect will partly reflect commitments from decisions made under prior GPS. Given this, the analysis only considers funding decisions for new

[1] https://www.transport.govt.nz/assets/Uploads/Report/Final-GPS-2018-measures.pdf ccc

investment activities first approved under GPS 2012, 2015 and 2018. GPS 2012 and 2015 are used as reference points to compare GPS 2018. Funding decisions for “baseline” activities such as routine maintenance is also excluded from most of the analysis to focus on the subset of available funding in each GPS period that is most likely and able to be influenced by policy directions in the GPS.

Transport investments have many interdependencies and external factors that affect performance and outcomes. Unfortunately, the scope of this evaluation and available data do not allow these to be identified exhaustively.

1.2.3 Qualitative data collection and analysis

The qualitative research components of the evaluation were intended to uncover some key drivers of investment decision making, factors affecting the relationships between inputs, outputs and outcomes, and perceptions of the extent to which the intentions of GPS 2018 are being realised.

In total, twelve interviews were held with 14 stakeholders in June-July 2022. Ten interviews were undertaken with 11 stakeholders with general insights into GPS 2018, comprising four stakeholders from Waka Kotahi and seven from external organisations. Two more interviews were held with three representatives from Auckland Transport and Waka Kotahi to explore two case studies of GPS 2018 investment.

Interviewees were selected for their expert knowledge of the GPS and transport planning and to gain insight from different sectoral perspectives on GPS 2018. Consequently, there is a wide diversity of views, particularly among external stakeholders, and we stress that a consensus view on GPS is often elusive and has not been sought. Note also that while the policy direction of GPS 2018 was beyond scope, some stakeholders inevitably commented on this as they reflected on GPS influence. These comments are included in this report as they help illustrate the factors that shape stakeholders' experience and understanding of the GPS.

1.3 To what extent has GPS 2018 influenced changes in NLTF investments, implementation and early stage outcomes?

Using predetermined criteria (aspects of performance reflecting key GPS 2018 priorities of safety, access, environment, and value for money), standards (rating definitions), and evidence (investments relative to GPS target ranges, combined with reflection across the quantitative and qualitative analysis in this report), we present evaluative judgements on the extent to which GPS 2018 has influenced transport investment decisions. The following rating definitions were used:

- Adequate: Not meeting all expectations but meeting minimum bottom line expectations and showing acceptable progress overall for 2018-21.
- On track: GPS influence meets reasonable expectations for 2018-21 (ie, as planned).
- Excellent: GPS influence exceeds expectations for 2018-21.

Overall, GPS 2018 is showing adequate progress toward expectations, particularly in the intended changes in the mix of investments towards public transport. These investment decisions are now flowing through to delivery, but it is too soon to evaluate their ultimate outcomes, given the time lags between investment decisions and delivery. In addition, the

influence of external factors on transport outcomes, such as the COVID-19 pandemic and responses to it during 2020 and 2021, also poses a challenge for attributing changes in outcomes to GPS 2018 itself.

To detail this further, Figure 1 below compares the funding ranges set out in GPS 2018 for each activity class with actual funding approved by Waka Kotahi, in total, for the three years from 2018/19 to 2020/21.[2] Approved funding is further disaggregated into that which has been claimed by approved organisations and that which is unclaimed. This indicates that most areas recorded investment approvals within the intended range. However, in many of the key areas of transformation, the GPS 2018 investments did not meet the intended levels:

- Claimed funding for state highway improvements is only around half of approved funding.
- Total approved funding for state highway maintenance is slightly higher than the upper limit in GPS 2018, although the amount claimed is substantially lower. This may reflect unexpected increases in maintenance costs and more emergency remediation than anticipated.
- Approved funding for walking and cycling improvements is near the top of the GPS range, but the amount claimed is below the lower limit of the range.
- Approved and claimed funding for transitional rail is at the low end of the GPS range.
- Approved and claimed funding for the promotion of road safety and demand management is below the low end of the GPS range.
- Approved funding for rapid transit is less than half of the low end of the GPS range and claimed funding is minimal.

This suggests that funding for transformational aspects of GPS 2018, such as continued walking and cycling improvements, transitional rail, road safety promotion, and rapid transit, faced challenges in meeting the minimum funding expectations in the GPS over the three years shown. Some of these challenges may reflect delays to projects caused by the COVID-19 pandemic.

[2] GPS funding ranges are calculated from Table 3 of the GPS 2018 document. Approved funding figures were obtained from the Waka Kotahi NLTP funding data dashboard

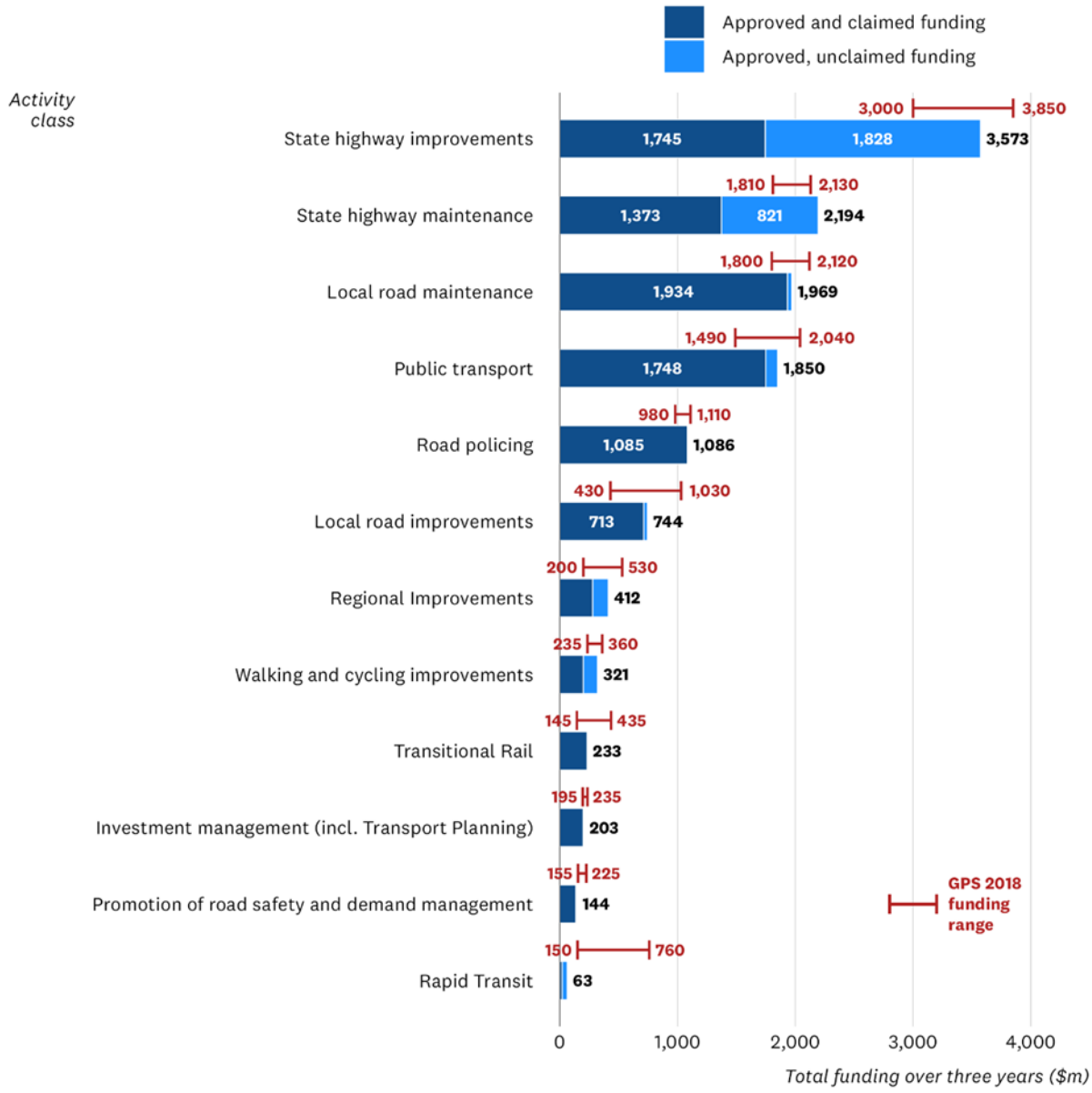

Figure 1 Transport investments 2018-2021, relative to the expected range of investment for each activity class

Based on more detailed investment data analysis, including committed forward expenditure, alongside qualitative feedback, we have reflected on progress against five key areas of GPS investment that represent the collective judgements of the authors based on the evidence and rating definitions presented in the report. Table 1 below provides our assessment of these areas of GPS delivery, summarised from available potential criteria and data. However, we acknowledge that for some areas, such as land use planning, there are no explicit measures available, and our evaluative judgements draw on the feedback from interviewees participating in the evaluation.

Table 1 Evaluative ratings of the influence of GPS 2018 as of mid 2022

Evaluation criteria	
Increased transport investment mix toward safety oriented investments	Adequate
Increased investment in a better integrated transport network, including public transport, walking and cycling and improved land use planning that aims to support improved throughput and access in metropolitan areas	Adequate – walking and cycling investment On track – public transport investment Adequate – improved land use planning
Increased investment in and delivery of transport projects that seek to promote the uptake of active travel modes to support environmental and public health objectives	Adequate – walking and cycling investment On track – public transport investment No impact – rapid transit
Increased focus on transport investment in ways that aim to promote active transport and public transport via improved infrastructure, better connections, and improved safety	
	Adequate
Increased rigour and transparency of transport investment appraisals	Adequate

1.3.1 Key areas of influence

From investment data analysis and qualitative interviews, GPS 2018 was seen to have a range of areas of influence, in particular:

- GPS funding shifted noticeably towards public transport funding and, to some extent, walking and cycling improvements, aligning with the access and safety objectives of the GPS.
- GPS 2018 was a catalyst for a broader understanding of the impacts of land transport and the land transport investments needed to address transport priorities.
- Consistent with the previous two GPS, benefit cost ratios (BCRs) for funded projects under GPS 2018 were typically above one among approved projects, with BCRs recorded in the data available, although not entirely.[3]
- GPS 2018 was also a driver for a significant review of the investment decision making framework and approach, and a new BCR methodology is now in place that should influence transport investments in the future.
- Results are now seen in shifts in transport planning and programmes. Again, budget allocations to activity classes were a key change mechanism.

However, the influence of GPS on transport investment is not linear and instead occurs through interrelationships of priorities between central and local governments. There is often

[3] Of the 1,806 investment activities that meet the criteria for inclusion in this analysis (see below), 40% have a BCR value recorded in the available data, reflecting around 72% of approved expenditure associated with these activities.

alignment with regional plans also driven by shared central and regional government objectives, particularly in Auckland. It is also apparent that any single GPS is limited in its short term effect on outcomes, and it is more likely that a sustained direction in successive GPS produces a change in outcomes over time.

1.3.2 Investment analysis

It is estimated that only approximately $3.8 billion out of $16.7 billion (23%) total approved funding during the three year GPS 2018 period was for activities that were not “baseline” and were first approved under GPS 2018. A greater amount of approved funding in these three years ($5.25 billion or 31%) was for non baseline activities that were first approved before GPS 2018 took effect, while the remainder ($7.6 billion or 46%) was for “baseline” activities that are less likely to be affected by GPS policy directions.

This highlights the constrained ability of an individual GPS to influence transport outcomes during the three years that it is in effect and means that outcomes during that period are strongly influenced by decisions made under earlier GPS.

In terms of investment activities first approved in each GPS period, and including future “probable” funding, GPS 2018 saw a shift towards funding for public transport improvements compared to earlier years. However, much of this shift is due to $3.25 billion of probable future funding, with around $2.1 billion for a single activity (the public transport improvements components of “Let's Get Wellington Moving”). The proportion of funding for walking and cycling improvement activities first approved under GPS 2018 was less than for activities first approved under GPS 2015 but greater than GPS 2012. GPS 2018 also saw an increase in total funding associated with road improvement activities compared to GPS 2015 and 2012, but this reflects a substantial amount of probable future funding (around $2.25 billion).

Compared to GPS 2012 and 2015, a greater proportion of funding for public transport improvement activities that first started under GPS 2018 was approved during the three year GPS 2018 period itself rather than in subsequent years after GPS 2018 was no longer in effect. This may indicate that the pace of investment in public transport improvements increased under GPS 2018.

Walking and cycling improvements also saw an increase in the funding for activities first approved under GPS 2018 compared to earlier periods if probable future funding is included. However, funding for such activities approved during the GPS 2018 period (rather than subsequently approved or tagged as probable future funding) was lower than funding approved during the three year GPS 2015 period.

Topic analysis of the descriptive text associated with investment activities indicates that safety is a descriptive characteristic of more than half of road, public transport, and walking and cycling improvements. Walking and cycling are also descriptive characteristics of around 10-20% of activities primarily classified as road and public transport improvements. This suggests that considering only activities funded by the walking and cycling activity class may understate the investment in these activities. Still, the amount of any understatement and the quality of walking and cycling facilities delivered as part of road improvements is unknown. Addressing this issue would require greater disaggregation of funding data than is currently available so that all expected and actual impacts and benefits of investments are recorded systematically.

Benefit cost ratios (BCRs) are considered in transport investment decision making and other factors, such as alignment with GPS priorities. Analysis of BCRs across GPS periods is complicated by changes in the methodology used to estimate benefits and costs of investments and by the fact that estimated BCRs for investments can change over time, given updated data or changes in scope. In all three GPS periods and for road, public transport, and walking and cycling improvements, it was uncommon for activities with a BCR of less than one to have funding approved (noting that a BCR was not recorded for all approved activities). Across all periods, the funding weighted average of BCRs for approved activities is around 2.0 to 3.0. There is no clear pattern of differences in BCRs for activities first approved under GPS 2018 as distinct from 2015 and 2012.

1.3.3 Further reflections on influence

GPS 2018 was a driver for a significant review of the investment decision approaching 2019, resulting in a new Investment Decision Making Framework (IDMF) implemented in 2020.

It should be noted that value for money was seen by some interviewees as an ongoing process/practice issue (through all GPS) and not necessarily one for which specific outcomes could be attributed to any particular GPS.

Qualitative interviews indicated that value for money is an important driver of investment decision making, including but not limited to BCRs. From discussions, it appears that value for money is considered across various dimensions of investment decision making, including alignment with GPS objectives and the prioritisation process intended to select the projects that best deliver outcomes from the investment available.

However, interviews also suggested BCRs appear to have a lower influence on, or are only one factor in, investment decision making than previously. Greater attention is now given to strategic alignment and non financial impacts (notably an intention of the new Investment Decision Making Framework). Benefits realisation and lessons learned were not substantial factors in considering value for money.

Some interviewees also noted that ideally, the investment levers enacted through the GPS would be more integrated with other levers and revenue sources required to achieve desired land transport outcomes – including urban form, regulatory, pricing, and other behaviour change strategies.

Stakeholders identified broad impacts from GPS 2018 when reflecting on the complexities and timeframes of the investment process described above but were often unable to provide more detailed or specific analysis.

1.4 What key factors affect the efficiency and effectiveness of converting inputs to outputs and outcomes?

GPS 2018 was relatively disruptive, compared to previous GPS, in that it signalled significant shifts in investment strategy. Responding to these shifts required various system changes, including developing new capacity and capability. These developments, and resultant outcomes, are still in progress.

Therefore, new priorities developed through GPS objectives need to be sustained over time (including future GPS) if the shift in investment and outcomes are to be more evident in the data.

Some feedback indicated turnover within the government sector to GPS 2018, as new mindsets and skillsets were required to implement signalled shifts in investment direction.

Some interviewees described the increased number of activity classes[4] and wider scope of GPS 2018 as creating funding pressure as the available resource was spread more thinly, some suggested that this process might also reduce impact overall.

Due to the change in government, GPS 2018 was finalised later in the planning cycle, meaning there were limited opportunities for RLTPs around New Zealand to respond, except Auckland. Some stakeholders reported that many existing planned projects were re-defined to fit new funding priorities rather than these projects changing substantially.

A range of broader factors that highlight the complexity of the transport system was seen to be either enabling or acting counter to GPS objectives, which can ultimately affect outcomes. These include:

- impact of rising fuel prices on behaviour change
- impact of the COVID-19 pandemic on behaviour change (eg, public transport mode shift)
- increasingly, transport related funding outside the GPS and NLTP, such as through direct Crown funding. There was a view that such investment reflected that the funding available from the NLTF was insufficient to address transport investment needs and the government's policy priorities.

1.5 Conclusions

To some extent, GPS 2018 investments are delivering their intended results, particularly in the changes in the mix of investments towards safety and public transport. These are now flowing through to delivery, but their ultimate outcomes are yet to be determined. Not surprisingly, several key informants observed that the level of funding allocated to each activity class was a key change mechanism, as project proposals to the NLTF tended to follow the money.

Key informants commonly described the investment direction of GPS 2018 as clearly signalling the need for a broader understanding of land transport and the land transport investments needed to address transport priorities. These signals were generally picked up in investment decision making by Waka Kotahi, but the timing of the GPS limited its influence in RLTPs outside of Auckland. As a result, the process that unfolds, particularly at a regional level, may sometimes be more of alignment than direct influence.

A key finding from this evaluation is the tension between using the GPS as a tool for transformative change and, at the same time, having sufficient consistency between successive GPS to build delivery momentum. The longstanding priorities established in earlier GPS sustained initiatives, such as the RoNS programme, over an extended period. The disruptive nature of GPS 2018 signalled significant shifts in investment strategy and required shifts in capability and capacity that are still in progress. The continuity of direction in GPS 2021 is likely to enhance the contribution to intended outcomes over time.

Although a GPS presents a ten year plan, relatively small proportions of funds are available for discretionary investment within every three years that a GPS is in effect. Increasing costs

[4] GPS 2018 had 12 activity classes, with two of these being new classes – “transitional rail” and “rapid transit.”

of maintaining the growing system could place further constraints on the ability of the NLTF to fund new initiatives. Within this context, greater attention to the continuous programme of precommitted investments to GPS objectives may offer a strategy for increasing the contribution of the overall investment response to GPS objectives.

Investment priorities are an important driver of decision making and implementation. However, an investment model alone will be limited in achieving the transformations needed. Therefore, it seems apparent that future GPS will increasingly look to enhance the integration between the investment levers available through the NLTF and other levers such as regulation, pricing, land reform, and spatial planning.

2 Introduction

2.1 Purpose and objectives

Te Manatū Waka (Ministry of Transport) commissioned a multidisciplinary team led by Dovetail Consulting Ltd to evaluate the Government Policy Statement on land transport 2018 (GPS 2018). The purpose of the evaluation is to improve understanding of whether and to what extent GPS 2018 investments (ie, those fully or partially funded by the National Land Transport Fund/ NLTF) have achieved their intended results over the three years of 2018/19-2020/21.

Although initially commissioned as an outcome evaluation, the long term nature of GPS influence means it is not feasible to seek to attribute outcomes such as road safety, transport mode shift and emissions reductions to the short 2018-2021 period of the GPS. Therefore, this evaluation is more process focused, emphasising the influence of GPS 2018 on transport investment decision making and planning during 2018-21. In addition, the influence of external factors on outcomes (such as the COVID-19 pandemic) makes it difficult to attribute changes in observed outcomes to the GPS itself.

The objectives of the evaluation are to:

a Improve our understanding of whether (and to what extent) GPS 2018 investments have achieved the intended results.

b Reflect on the relationship between Te Manatū Waka and Waka Kotahi (New Zealand Transport Agency) to explore how the intentions behind the GPS, and the signals the GPS delivers, are understood and enacted.

c Generate insights into the linkages between inputs, outputs and outcomes to identify how GPS 2018 influences investments and contributes to observed outcomes.

d Provide reflections from GPS 2018 to assist in monitoring and implementing GPS 2021 and developing GPS 2024.

Two key evaluation questions (KEQs) guide this work and provide the core structure for this report:

1 To what extent has GPS 2018 influenced changes in NLTF investments, implementation, and early stage outcomes?

2 What key factors affect the efficiency and effectiveness of converting inputs to outputs and outcomes?

Appendix 1 of this report details trends observed in key GPS outcomes. Appendices 2 and 3 detail data considered for this review for criteria analysis and further detail on investment data analysis.

2.2 Background to GPS 2018

GPS 2018 sets four clear priorities that guide the National Land Transport Programme (NLTP) and its investments through the National Land Transport Fund (NLTF) and other funding sources:

- Safety (a safe system free of death and serious injury)

- Access (including access to economic and social opportunities, enabling transport choice and access, and resilience)
- Environment (including reduced greenhouse gas emissions)
- Value for money (delivering the right infrastructure and services to the right level, at the right cost).

In GPS 2018, Safety and Access are positioned as leading priorities and Environment and Value for money as supporting priorities that underpin decision making across transport decisions.

GPS 2018 marked a shift in priorities from earlier GPS publications, the 2012 and 2015 GPS both focused on economic growth and productivity, value for money and road safety. In addition, the inclusion of access and environment significantly broadened the scope of GPS 2018 from its earlier versions.

It is also worth noting that each GPS is a ten year investment strategy that can be refreshed every three years. Although each GPS has a long term view, since its first GPS was produced, it has been refreshed every three years. As noted above, however, there was strong consistency between the 2012 and 2015 GPS which provided some policy certainty. The changing priorities in GPS 2018 could set the scene for longer term changes in transport investment, with some flow on effects to implementation, delivery, and outcomes yet to be seen.

In planning for this evaluation, we developed a theory of change to describe how change and outcomes from GPS 2018 were expected to occur.[5] Figure 2 sets out the theorised process, summarised below.

- Te Manatū Waka, working with the Minister of Transport and Associate Minister(s) of Transport, developed the GPS and the key outcomes agreed upon by the government through investment strategy, strategic priorities and objectives, and activity classes. The GPS then guides investment decision making by Waka Kotahi and regional councils.
- Waka Kotahi, through its independent board and commissioning functions, and regional councils decide the investment mix nationally and regionally, respectively.
- Waka Kotahi, along with regional councils, territorial authorities and council controlled organisations (CCOs), deliver on transport investments through planning, procurement processes, and contracting.
- These same organisations, and their contracted providers, then implement the GPS direction through design, consultation processes, construction, and service delivery.

However, it is important to note the limitations of any individual GPS. Figure 3 provides a conceptual diagram that highlights the following:

- The legacy effects of previous investment decisions that are fully completed and can be some years in the making (eg, the Roads of National Significance

[5] Funnel, S.C., Rogers P.J. (2011). *Purposeful program theory: Effective use of theories of change and logic models*. Hoboken: Wiley.

programme) mean that much transport investment expenditure may have been precommitted under prior GPS.

- Proposals/business cases that were stopped due to changing priorities or circumstances.
- Investments that commenced in the three years when GPS 2018 was in effect but which are not concluded in that period.
- Other related policy and investment areas independent of the GPS or regional land transport plans (RLTPs) can be influenced by the GPS, and also determine local priorities. Together these can consume a significant amount of available funding.

Accordingly, in the short term, the range of investments influenced by any GPS period may be quite limited, with substantial transport expenditure (historically around three quarters of the transport investment in any year) precommitted or allocated to “baseline” activities such as ongoing maintenance. On the other hand, the GPS can provide certainty by setting important long term signals that are realised beyond the immediate three year NLTP. This can produce changes over a decade and is gradually reflected in transport investment decisions made by Waka Kotahi, territorial authorities, and regional councils. However, the pace of change is an issue in the face of urgent strategic imperatives such as climate change and the road safety burden.

We also note a "top down and bottom up" relationship in the GPS, in that the Minister and Te Manatū Waka prepare the GPS, which sets the overall direction. Local and regional councils prepare Regional Land Transport Plans (RLTPs), with Waka Kotahi developing and implementing the NLTP and managing expenditure within the NLTF.

Because of the limitations of any one GPS in delivering outcomes over the short term, this report focuses largely on investment decision making and the factors that affect investments, ultimately resulting in outcomes. Stakeholder discussions explored the impact of GPS in investment planning and implementation and where these could be identified. Some discussion is included. However, these were generally less evident in the short time since GPS 2018 was published. For the future, it would be useful to explore the range of projects that resulted from GPS investments and any monitoring of benefits realisation undertaken to provide a clearer picture of GPS impact and, ultimately, transport system outcomes.

Appendix 1 details a selection of observed trends in GPS outcomes for contextual information.

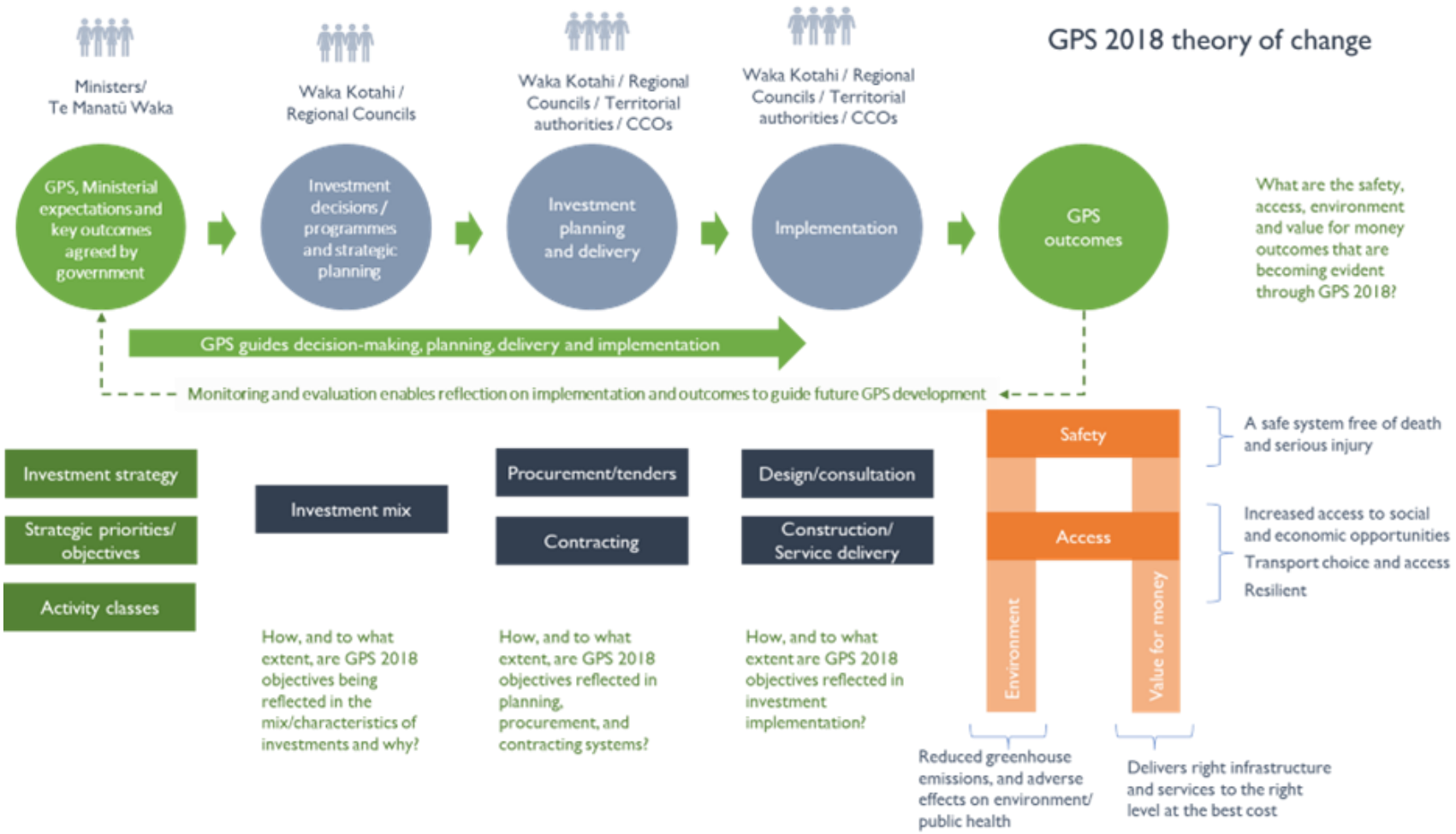

Figure 2 GPS 2018 Theory of Change

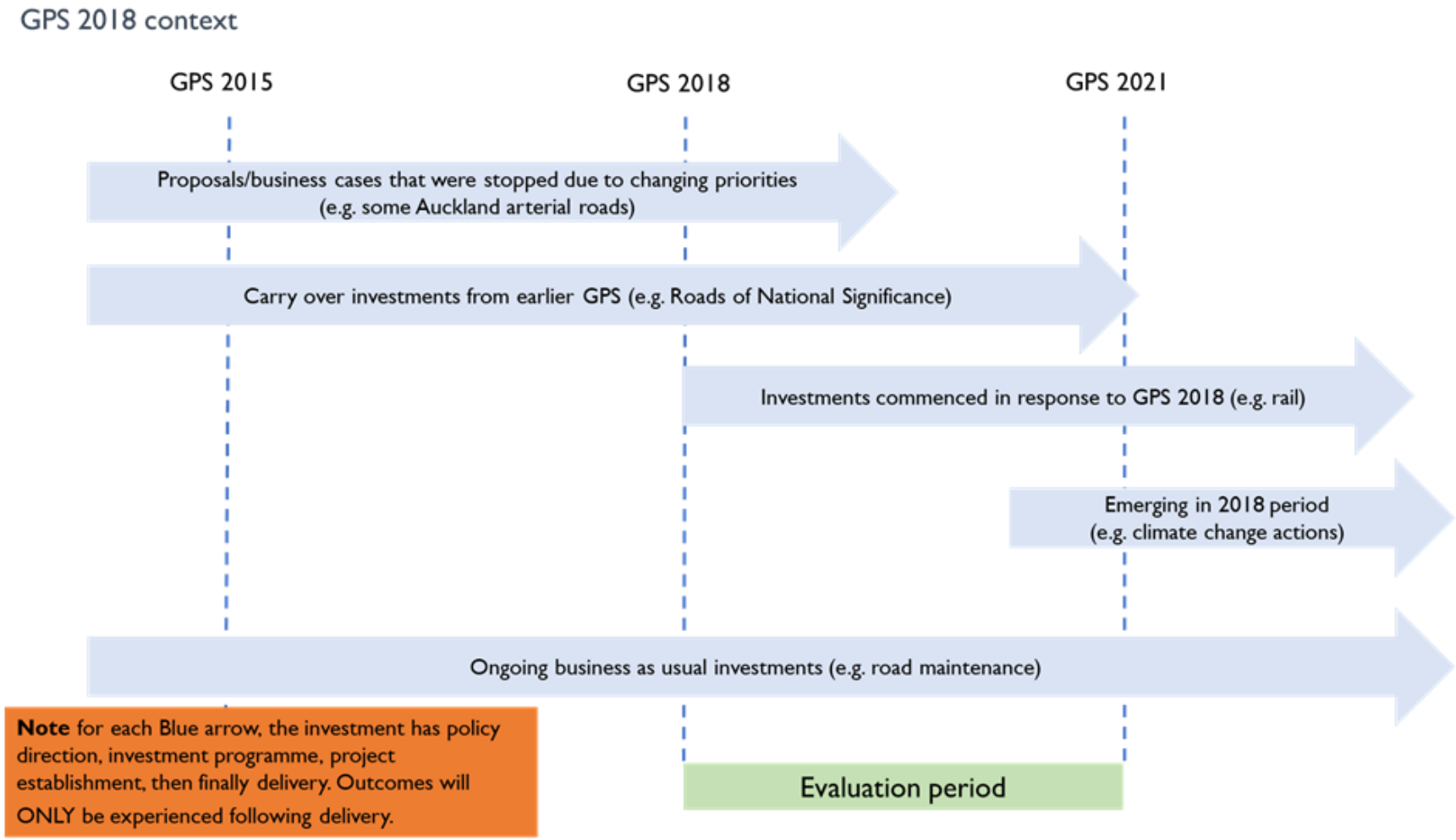

Figure 3 Scope of GPS influence (conceptual diagram)

3 Methods

3.1 Establishing evaluation criteria

This evaluation uses explicit criteria (aspects of performance) to address KEQ1 (To what extent has GPS 2018 influenced changes in NLTF investments, implementation and early stage outcomes?). Criteria summarise the focal points for this evaluation component and provide a transparent, agreed framework for making robust judgements from the evidence, in line with standards for good evaluation practice.[6]

Evaluation criteria are aligned with the GPS 2018 short term results and final reporting measures established by Te Manatū Waka for GPS 2018, reflecting the key priorities of safety, access, environment, and value for money.[7] For this evaluation, the key evaluation criteria focus on the following, drawing on qualitative and quantitative analysis:

- Increased transport investment mix toward safety oriented investments
- Increased investment in a better integrated transport network, including public transport, walking and cycling and improved land use planning that aims to support improved throughput and access in metropolitan areas
- Increased focus on transport investment in ways that aim to promote active transport and public transport via improved infrastructure, better connections, and improved safety
- Increased investment in and delivery of transport projects that seek to promote the uptake of active travel modes to support environmental and public health objectives
- Increased rigour and transparency of transport investment appraisals.

Appendix 2 explains how these criteria were selected. In detailed planning for this evaluation with Te Manatū Waka and Waka Kotahi, a range of potential criteria were developed to explore the extent to which GPS outcomes are realised. In addition, a wide range of data was reviewed for its potential to inform the evaluation, drawing on GPS 2018 short term results and final reporting measures established by Te Manatū Waka for GPS 2018.

GPS 2018 established many quantitative reporting measures. The sources of quantitative evidence focus on measures most relevant to the evaluation criteria, where data is currently available, and where there is confidence that evaluative conclusions can be reached. The proposed quantitative evidence sources also consider the smaller set of reporting measures established for GPS 2021.[8] Following feedback from Te Manatū Waka and Waka Kotahi, we refined the indicator set to those that are measurable, reportable and relevant to this evaluation, noting where indicators may be useful for future monitoring but are not currently available.

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6 Yarbrough, D. B., Shulha, L. M., Hopson, R. K., and Caruthers, F. A. (2011). *The program evaluation standards: A guide for evaluators and evaluation users (3rd ed.).* Thousand Oaks, CA: Sage

7 https://www.transport.govt.nz/assets/Uploads/Report/Final-GPS-2018-measures.pdf

8 https://www.transport.govt.nz/assets/Uploads/Paper/GPS2021.pdf

3.2 Investment analysis objectives and scope

This analysis explores the extent to which GPS 2018 impacted transport investment funding decisions. Due to prior investment commitments and ongoing "baseline" activities such as maintenance, only a fraction of transport funding while a GPS is in effect can be directly influenced by the policy directions of that GPS. This analysis compares *new* funding decisions for transport infrastructure and other improvements made under GPS 2018 to those made under GPS 2015 and 2012.

To simplify the analysis, we focus on initial funding decisions for new investments and do not consider decisions to increase or decrease funding for investments already in progress. This is consistent with the decisions taken as part of GPS 2018 development that sought to ensure funding levels were sufficient to complete projects already committed. However, this is a limitation of the analysis (due to data limitations and the complexity of the funding process), as subsequent decisions to increase or decrease funding for existing investments may also reflect GPS policy priorities at the time.

Our analysis of funding, therefore, reflects expected funding at the time these decisions were made rather than actual funding that has occurred over time which could be a result of changes in delivery cost, scope or other factors.[9] The dollar amounts we report should represent relative funding priorities and not actual investment outcomes. Investments entirely funded from external sources outside the NLTF are also excluded, as these are less likely to have been influenced by GPS policy directions.[10]

With these exclusions, this analysis is based on 1,806 transport investment activities associated with 3,344 phases, some extending beyond the GPS period in which the activity was first approved. In addition, given that funding approvals for activities with multiple phases can be a gradual process, the analysis includes funding that had already been approved at the time the data was extracted (up to April 2022) as well as funding for phases included in the 2018-21 NLTP extract that had not yet been approved but had "probable" funding status. This is necessary because less time has elapsed for funding to be approved for activities started under GPS 2018 compared to activities started under GPS 2012 or 2015.

Recognising the difficulty of classifying investments and the reality that some investments have multiple objectives and involve multiple transport modes, this analysis also includes an application of natural language topic analysis to attempt to identify secondary impacts of investments beyond their broad application. For example, investments classified as road or public transport improvements may also provide some walking or cycling facilities or provide safety improvements.

This analysis is a novel application of natural language and funding approvals data that focuses on forward looking decisions rather than backward looking actual expenditure. As such, it has a greater ability to shed light on the impacts of GPS policy directions on transport decision making. Further work to refine and repeat this analysis regularly could be useful to understand better how transport funding is tracking relative to policy objectives.

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9 Such changes could also affect ex-post realised benefits and costs, and hence the realised BCR may differ from the expected BCR of an investment.

10 We also exclude funding for *SuperGold* trip payments. This is predominantly Crown-funded and supports a specific policy decision that is adjacent to the GPS.

Some suggestions to improve the data quality and make it more widely available are included in the last section, based on the experience of preparing this analysis.

3.3 Investment analysis data sources

Analysis of the impacts of GPS 2018 on changes to funding investment decisions is primarily based on an extensive set of data extracted from Waka Kotahi's Transport Investment Online (TIO) system, described below. This data gives detailed information about actual historical and planned future funding for transport activities and enables funding that has been approved (up to a point when the data was extracted) to be distinguished from funding not yet approved.

Some publicly available information published by Waka Kotahi about actual annual expenditure on transport activities was also used.[11] This gives information about financial year expenditure in broad categories by Waka Kotahi and local authorities.

3.3.1 NLTP extracts

Full NLTP extracts were obtained from TIO for the 2012-15, 2015-18 and 2018-21 NLTPs. We use these extracts to analyse transport investment decisions made under GPS 2012, 2015, and 2018 respectively. Combined, these extracts include information about 5,208 unique investment activities, further broken down into 15,138 investment phases. This includes some ongoing phases that were approved for funding before GPS 2012 took effect, some that were subsequently approved after GPS 2018, and some that have not had funding approved, ie, are still waiting for approval or have had funding declined.

Any investment phases ongoing across NLTP periods are included in more than one of these extracts. As we are interested in initial funding decisions, in such cases, we used funding information from the NLTP extract corresponding to the time when funding for the phase was first approved.

3.3.2 Funding approvals

Monthly funding approvals reports from August 2011 to April 2022 were extracted from TIO and combined into a single funding approvals dataset. This includes records of 63,454 funding approvals to increase or decrease funding for activities already in progress. As described above, we focused on first approvals for new funding only. We scanned the approvals dataset for each investment phase to find the earliest month funding for that phase was approved. We used this as the date of approval for the phase.[12] These dates were matched with GPS periods to determine whether funding decisions were made under GPS 2012, 2015, or 2018 (or before GPS 2012 / after GPS 2018).

3.3.3 Data limitations

Transport investment funding is a complex process, with projects often being revised over time in scope and cost. The NLTP snapshots only provide a partial window into this process.

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11 Available at https://www.nzta.govt.nz/planning-and-investment/learning-and-resources/transport-data/data-and-tools/.

12 For 421 phases (3.4% of phases recorded as having a status of funding approved in the NLTP extracts), no approvals record could be found. Most (75%) of such phases appear to have started before 2011, ie, before the beginning of the approvals dataset. In all cases where the approval date for a phase could not be determined, the starting year of the phase as recorded in the NLTP extract was assumed to be the year that funding for the phase was approved.

Across the large number of projects included in our analysis, it is not feasible to examine the evolution of each investment. In addition, the data captured in TIO about investments has changed over time. As a result, there are some differences in the data fields across the three NLTP snapshots, and the way investment activities are classified (activity classes) has changed over time. Data is entered into TIO by numerous people across many organisations, and the quality and quantity of the information provided vary.

Given these limitations, our analysis uses a subset of the NLTP extracts that are generally consistent across the three periods and adjusts for changes in investment classifications (see below). However, our analysis is only accurate to the extent that the data recorded in these extracts is accurate and complete.

3.4 Investment data analysis methodology

3.4.1 Determining the first approval date for each activity and assigning activities to a point in time

To simplify our analysis, we used the three year GPS period in which funding for the *first* phase of activity was approved as the GPS period of approval for activities consisting of multiple phases. This reflects that subsequent approvals for phases of an activity are contingent on approval of the first phase and allows us to link the initial funding decision for an activity to a single three year GPS period. Of course, GPS policy directions may also influence approvals for subsequent phases after the first phase. Still, the extent to which this happens is unclear from the available data, so we focus on the first approval.

Funding for phases is often spread across several years and may overlap with more than one GPS period. Therefore, to simplify our analysis, we assign the total cost over all years of all *approved* investment phases of an activity to the GPS period when the first phase of that activity was approved. This allows us to examine the extent to which long term funding commitments have changed under each GPS period.

Since later phases of an activity may not be approved until years after the first phase approval, for activities first approved under GPS 2018, it is more likely that some phases have not yet been approved compared to activities first approved under GPS 2015 and 2012. Recognising this, we also include in our analysis expected funding for future phases that are recorded as having “probable” funding status of activities that were first approved under GPS 2012, 2015 or 2018. However, given that such funding is not yet approved, we distinguish it from funding for approved phases (see below).

Figure 4 illustrates the above for a hypothetical investment activity with six phases. The earliest funding approval occurred during GPS 2012, so the total cost of all approved phases ($600m) is attributed to a funding decision made during that period. In addition, funding for phase six ($50m) is not yet approved. Still, it has "probable" funding status in the NLTP 2018 extract, so this funding is also attributed to the original funding decision but is distinguished from funding that has been approved.

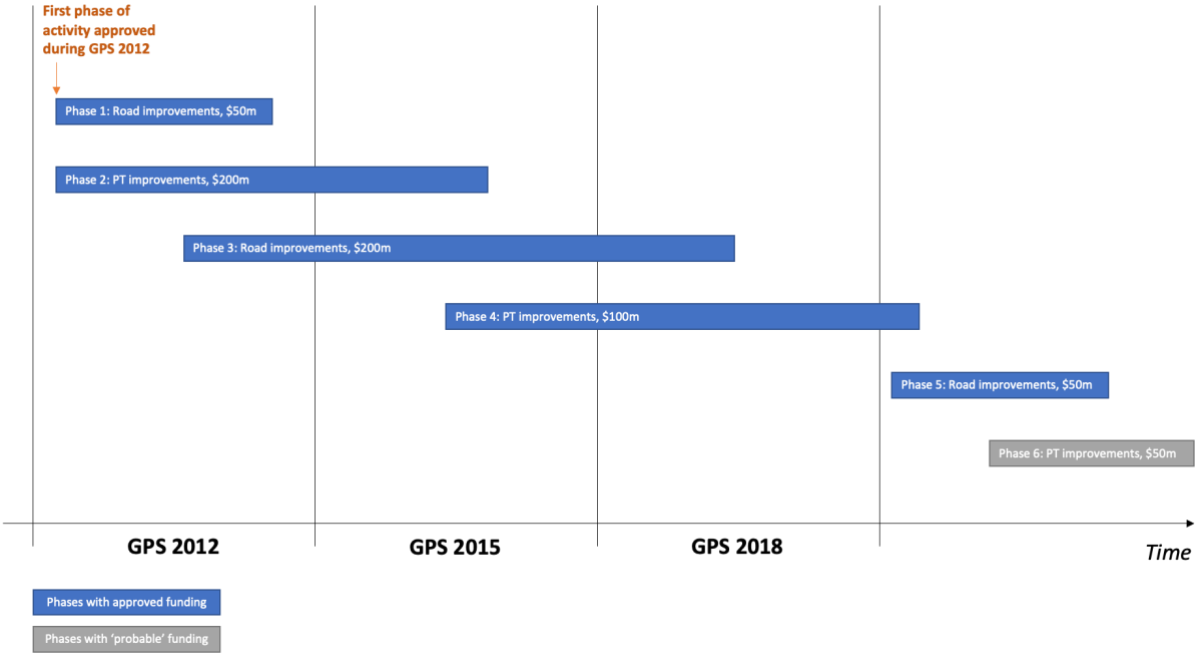

Figure 4 Illustration of funding allocation for a hypothetical investment activity

3.4.2 Identifying "baseline" activities

Baseline activities, such as routine maintenance, were identified based on advice from Waka Kotahi. This was done by classifying the type of TIO template used for the funding applications of investment phases (see Appendix 3 for details). However, baseline activities were excluded from the subsequent analysis for the above reasons.[13]

3.4.3 Investment activities included in the analysis

As described, this analysis examines how the mix of the newly funded investments under GPS 2018 differed from those newly funded under GPS 2015 and 2012. The Criteria list below summarises the criteria for selecting the subset of transport investment activities included in the subsequent analysis. Of the 5,208 investment activities included in the combined dataset, 1,806 satisfy these criteria, of which 750 were first approved under GPS 2012, 545 were first approved under GPS 2015, and 511 were first approved under GPS 2018. These activities are associated with 3,344 investment phases, excluding phases with negative total costs.[14]

[13] Using this classification, across all activities in the dataset, there are no activities with a mix of baseline and non baseline phases, ie, baseline activities can be excluded from the analysis entirely.

[14] Phases with negative costs reflect debt repayments or other financing arrangements. Our understanding is that these phases are matched by costs in other phases of the same activity, and thus the negative phases can simply be excluded to calculate the total cost of an activity.

Criteria list for including investment activities in subsequent analysis

Transport investment activities are included in the remainder of this analysis if all the following conditions are satisfied:

- The activity is not a baseline activity (as defined above)
- The activity was not entirely funded by external funding sources (Crown or debt funding), ie, some funding for one or more phases came from the NLTF
- Funding for the first phase of the activity was first approved in the GPS 2012, 2015, or 2018 periods
- At least one of the activity class or work category are recorded in the TIO data for at least one phase of the activity
- The activity is not funding for *SuperGold* trip payments

3.4.4 Categorising activities

Activities were classified to reflect their main purpose. This was done in two ways:

- Coding activities to a set of "analysis groups" based on the activity class, work category, and funding source information recorded in the TIO data.[15]
- A machine learning natural language processing model was used to evaluate the descriptive text associated with each activity to detect whether certain topics were relevant for that text (see section 6.5.2.5 for more details).

The topic analysis was used to complement the analysis groups, recognising that it uses text analysis that will not be perfectly accurate. However, activity class and work category are relatively restrictive. They may not fully reflect the intent of activities relating to more than one transport mode or offer benefits in addition to the main purpose of the activity. For example, safety improvements that occur as part of broader projects or where an activity has the primary purpose of road improvements and provides some walking or cycling facilities.

3.4.4.1 Analysis groups

Each combination of funding source, activity class, and work category was assigned to one of eight "analysis groups" or was excluded from the analysis (see Appendix 3 for details). Due to changes in definitions over time, it was necessary to aggregate some types of activity. For example, improvements to state highways and local roads are included in "state highway improvements", "local road improvements", "regional improvements", and "road to zero" activity classes under different NLTP extracts. For activity classes like "regional improvements" and "road to zero", it is not always possible to determine from the activity class and work category information alone if these were related to state highways or local roads. Hence, improvements to state highways and local roads were combined into a single road improvements group for analysis.

The eight analysis groups distinguish broad transport modes and separate improvements from maintenance, operation, and renewals activities:

[15] Activity class and work category are general and more detailed classifications respectively of the objectives and purpose of an investment phase. Definitions of activity classes and work categories have changed over time (see below).

- road improvements
- road maintenance, operation & renewals
- public transport improvements
- public transport services, maintenance, operation & renewals
- walking & cycling improvements
- walking & cycling maintenance, operation & renewals,
- road safety promotion, road policing & demand management
- investment management, planning & sector research.

Of the 1,806 activities included in the analysis, 88 (5%) had phases that fall into more than one of the eight analysis groups above.[16] For simplicity, in subsequent analyses broken down by analysis group, each activity was included in all relevant analysis groups if there was more than one for the activity.[17] Figure 5 summarises the total number of activities in each of the eight groups. Few activities in the maintenance, operation and renewals groups reflect the criteria from the Criteria list above as most such activities were classified as "baseline" activities and excluded from the analysis. In addition, we understand that between 2018 and 2021, walking and cycling maintenance, operation and renewals were funded by the maintenance, operation and renewals of local roads. In any case, most of our analysis below is focused on improvement activities. Most maintenance, operation and renewals activities are considered "baseline" activities less likely to be influenced by GPS policy priorities.

[16] This can be caused by activities that have multiple phases across more than one activity class or work category (eg, road improvements and public transport improvements phases), or by activities with individual phases that are split across two activity classes (eg, public transport improvements and public transport services).

[17] Where an activity is in two analysis groups because one of its phases has been split across two activity classes, it is not straightforward to divide the total cost of the activity across the two analysis groups. In such cases, we include the total cost of the activity in both analysis groups. This means that there is some double counting of funding across analysis groups

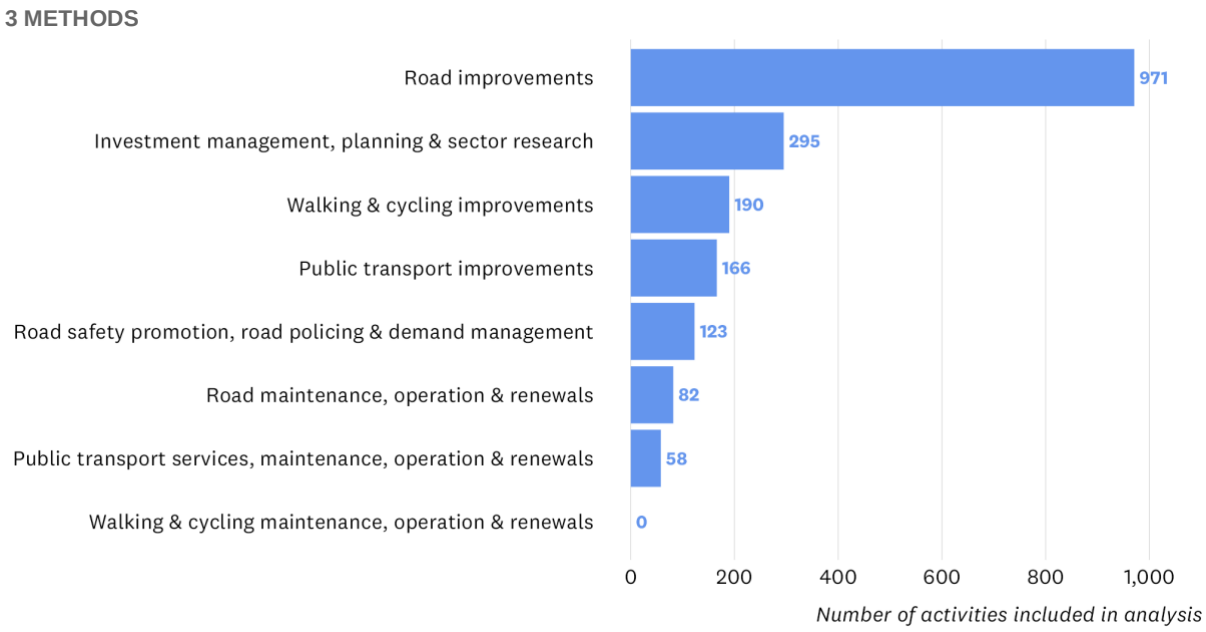

Figure 5 Number of activities included in the analysis by analysis group

3.4.4.2 Topic analysis

The NLTP dataset includes descriptive text relating to the purpose and objectives of each activity and phase. Figure 6 shows the proportion of activities in each of the analysis groups defined above where five key topics were detected (see Appendix 3, page , for details). For example, among activities in the “road improvements” group, safety was detected as a relevant topic for 70% of activities and walking for 13%. It is common for multiple topics to be detected in the descriptive text for an activity. Of the 1,806 activities included in this analysis, more than one of the five topics listed above was detected for 1,188 (66%). On the other hand, none of the five topics was detected for 271 (15%) activities, noting that no descriptive text was available for 108 activities. A further 67 fell into the “investment management, planning & sector research” analysis group.

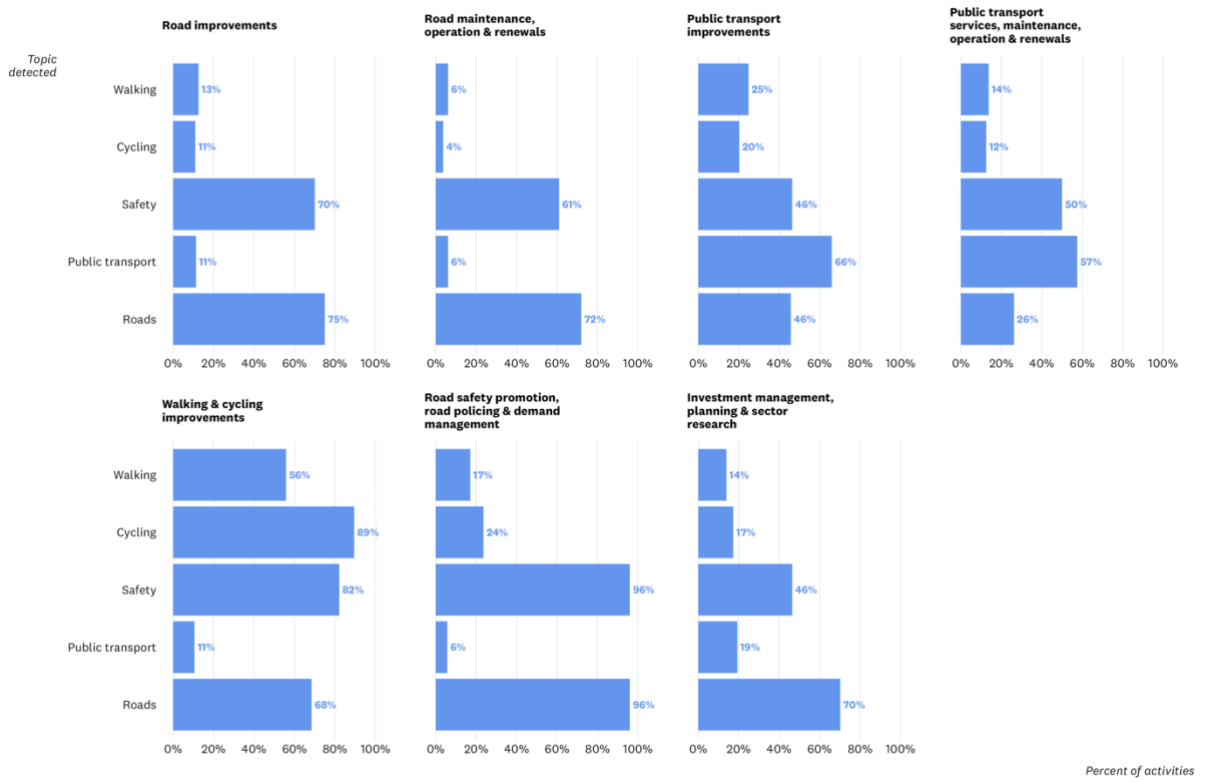

Figure 6 Topics detected among activities by analysis group

3.4.5 Analysis of actual expenditure data

Public data on annual actual transport expenditure was obtained from Waka Kotahi's website and was categorised for analysis. This gives information about actual annual expenditure, which may relate to ongoing projects that were approved and started in earlier GPS periods. However, this means that it provides limited information about the impacts of each GPS on funding decisions, given the significant time lag between funding decisions and actual expenditures.

Expenditure by Waka Kotahi and local authorities was combined, and some reported categories were combined to summarise actual expenditure, like the analysis groups described above. The categories that were defined are described in the Appendix.

3.5 Qualitative research objectives and approach

The qualitative research components of the evaluation are intended to uncover some of the key drivers of investment decision making and to explore perceptions of the extent the intentions of GPS 2018 are realised.

In total, twelve interviews were held with 14 stakeholders in June-July 2022. Of these, ten interviews were undertaken with 11 stakeholders with general insights into GPS 2018, comprising four stakeholders from Waka Kotahi and seven from external organisations (Automobile Association, Cycle Action Network, Living Streets Aotearoa, Local Government NZ, and Transporting NZ). In addition, two further interviews were held with three representatives from Auckland Transport and Waka Kotahi to explore two case studies of GPS 2018 investment (these case studies will be discussed in subsequent reporting and do not form part of this analysis).

Interviews focusing on general insights into GPS 2018 explored the following issues:

- general influence of GPS on transport investment and planning
- changes in investment mix towards the overarching priorities of GPS 2018
- key transport projects funded through GPS 2018 and the extent to which they reflect GPS 2018 priorities
- process shifts occurring through GPS 2018 implementation (eg, procurement and contracting)
- signals of GPS 2018 delivering on safety, access, environment, and value for money outcomes
- key shifts achieved by GPS 2018 overall, and challenges to achieving such shifts
- potential case studies of GPS 2018 implementation.

Case study interviews explored the following:

- overview of how the case study was developed and implemented
- alignment of case study with GPS 2018 objectives
- significance of the case study considering GPS 2018
- factors that enabled or hindered alignment with GPS 2018
- Value for Money assessments, benefits realisation and reporting of benefits
- lessons of the case study for future GPS implementation.

Qualitative findings were explored using thematic analysis approaches. Thematic analysis methods are used to comprehensively and systematically explore and map out emerging themes from the range of qualitative data. This follows a process of familiarisation with the interview data, generating initial codes, searching for themes, reviewing and mapping themes, defining and naming themes, and reporting.[18]

[18] Braun V, Clarke V. 2006. Using thematic analysis in psychology. Qual. Res. Psychol. 3, 77–101.

4 To what extent has GPS 2018 influenced changes in NLTF investments, implementation and early stage outcomes?

This section summarises our analysis of the data for investment activities that satisfy the conditions outlined in the Criteria list above. This analysis focuses on funding allocations and national benefit cost ratios (BCRs) and the extent to which these differ under GPS 2018 compared to GPS 2015 and 2012. For context, a brief analysis of actual expenditure is provided first. This detailed analysis is followed by reflections from qualitative interviews on areas of influence in GPS 2018 and key areas of impact.

4.1 Key themes

From investment data analysis and qualitative interviews, GPS 2018 was seen to have a range of areas of influence, in particular:

- GPS funding noticeably shifted towards public transport funding and, to some extent, walking and cycling improvements, aligning with the GPS' access, safety and environmental objectives.
- GPS 2018 signalled the need for a broader understanding of the impacts of land transport and of the land transport investments needed to address transport priorities and new challenges eg, the urgent need to reduce transport related emissions.
- Not surprisingly, the level of budget allocated to each activity class was described by several interviewees as the key change mechanism.
- BCRs for funded projects were typically well above one among approved projects for which BCRs were recorded in the data available.
- GPS 2018 was also a driver for a significant review of the investment decision making framework (IDMF) and approach, a new BCR methodology is now in place that will influence transport investment decisions in the future.
- Results from shifts in response to GPS 2018 are now seen in many transport planning and programmes.

Other areas of impact were seen as:

- within larger roading projects, greater attention to alternative and multimodal solutions, as required under GPS 2018
- increased attention to urban form and access to housing as part of a more integrated investment response
- increased investment in maintenance activity classes
- a new emphasis on safety investments.

However, the influence of GPS on transport investment is not linear and instead occurs through interrelationships of priorities between central and local governments. There is often

alignment with investment decision making, which is also driven by shared central and regional government objectives, particularly in Auckland.

Any individual GPS has limited ability to influence transport outcomes because of the ongoing influence of previous GPS, other funding avenues, and ongoing business as usual interventions.

4.2 Context: Actual expenditure by GPS period

Figure 7 and Figure 8 on the following pages show breakdowns of actual expenditure by type of activity based on Waka Kotahi data.[19] Infrastructure expenditure has been aggregated and includes the following categories of expenditure:

- Public transport: Infrastructure development
- Roads: Minor improvements, new roads and bridges, property purchases, and resilience improvements
- Walking & cycling: Walking facilities and cycling facilities.

Noting that actual expenditure in any given year or GPS period partly reflects funding decisions made in prior years or GPS periods, this shows:

- While actual dollar expenditure on roads related activities was higher during GPS 2018 than during GPS 2015 and 2012 (Figure 7), the proportion of expenditure on roads fell continuously during the GPS 2018 period (Figure 8).
- Actual expenditure on public transport activities grew during GPS 2018 (Figure 7), reflecting a continuation of a trend that appears to have started during GPS 2015 (and noting that expenditure fell in 2020 compared to 2019). This was due to increased expenditures on public transport infrastructure and services/information. In proportionate terms, the relative shift towards public transport activities accounts for most of the road expenditure reduction during GPS 2018 (Figure 8).
- There were also increases in expenditure on walking and cycling during GPS 2018, particularly in the 2020 financial year. This appears to be due to footpath maintenance becoming eligible for specific funding in 2018. The proportion of actual expenditure on walking and cycling has increased gradually over time, starting in the latter stages of GPS 2012 and continuing during GPS 2018 (Figure 8).

[19] Investment management expenditure is excluded from Figure 7. As shown in Figure 8, this is a small and relatively constant proportion of actual expenditure in each year.

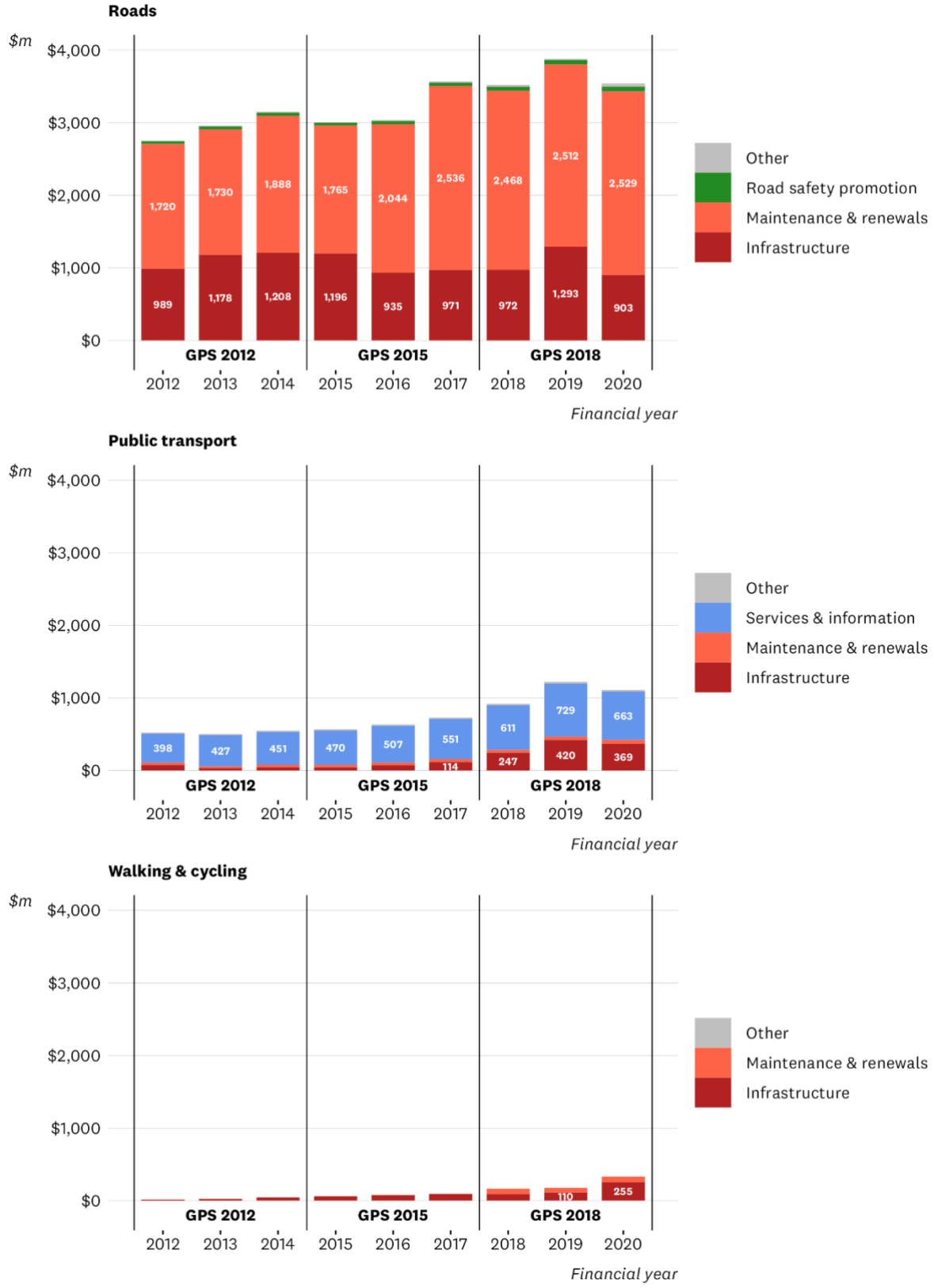

Figure 7 Actual expenditure on transport activities

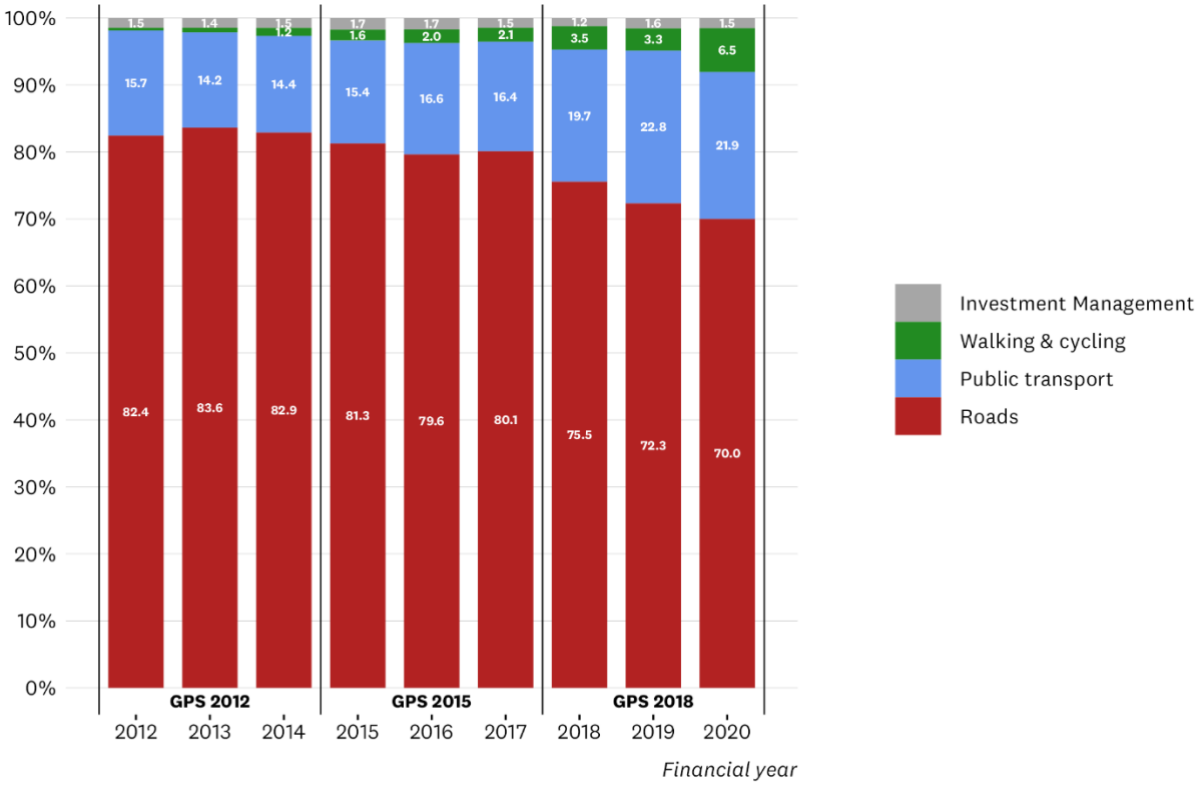

Figure 8 Distribution of actual expenditure on transport activities

4.3 NLTP activities & approvals: Overview of approved funding by GPS period

An overview of NLTP funding in each of the three GPS periods calculated from the NLTP and approvals data described above is shown in Figure 9.[20] Funding for investment activities in each three year GPS period is separated into baseline activities (as described above) and non baseline (investment) activities. In each three year period, baseline activities accounted for around half of the funding, and expenditure associated with activities first approved in prior GPS periods accounted for around one third of funding.

[20] Activities entirely funded from non NLTF sources (ie, Crown or debt funding) are excluded from these totals.

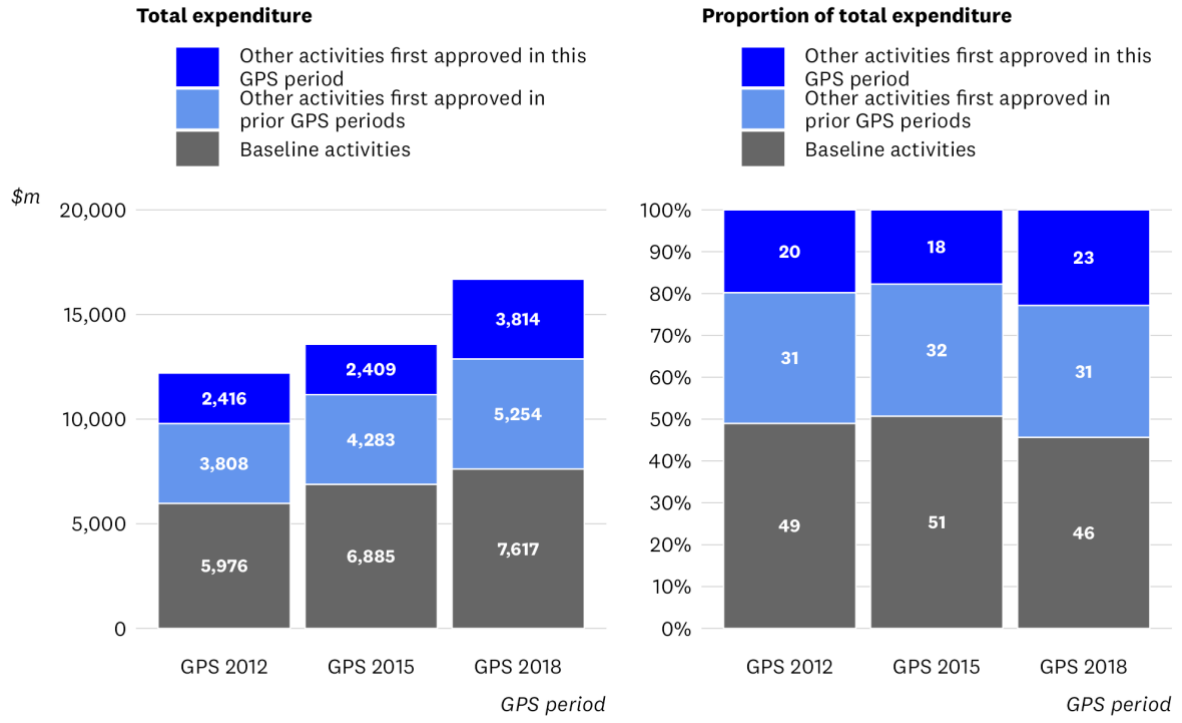

Figure 9 Breakdown of approved funding in each GPS period by type of activity and period of first approval

This illustrates the extent to which transport funding in any given GPS period is constrained by activities already in progress that were started in a prior GPS period and baseline activities. For example, in the three year GPS 2018 period, we estimate that about $3.8 billion out of $16.7 billion total approved funding (23%) was for non baseline activities first approved in the GPS 2018 period. A greater proportion of approved funding ($5.25 billion or 31%) was for non baseline activities that were first approved before GPS 2018 took effect. This highlights the limited ability of an individual GPS to influence transport investments in the three years it is in effect.

4.4 Trends in transport investment decision making

Figure 10 summarises the total cost associated with activities first approved in each GPS period in the eight analysis groups described above (noting that some activities fall into more than one analysis group). The costs shown reflect the total cost of all phases of relevant activities across all years. They are separated into costs for phases approved for funding in the same GPS period as the first phase of the activity (dark blue), and phases subsequently approved (light blue). Future expenditure for phases not yet approved (as of April 2022) with "probable" funding status is also shown (grey). This is considerably larger for activities first approved under GPS 2018 than in earlier periods, presumably because less time has elapsed for such funding to be approved.[21]

[21] The small amounts for maintenance, operation, and renewals in Figure 10 reflect the fact that most such expenditure was classified as “baseline” (as defined above) and was excluded from this analysis. In practice, such baseline activities make up a substantial proportion of actual expenditure in each GPS period (see Figure 9 above).

4 TO WHAT EXTENT HAS GPS 2018 INFLUENCED CHANGES IN NLTF INVESTMENTS, IMPLEMENTATION AND EARLY STAGE OUTCOMES?

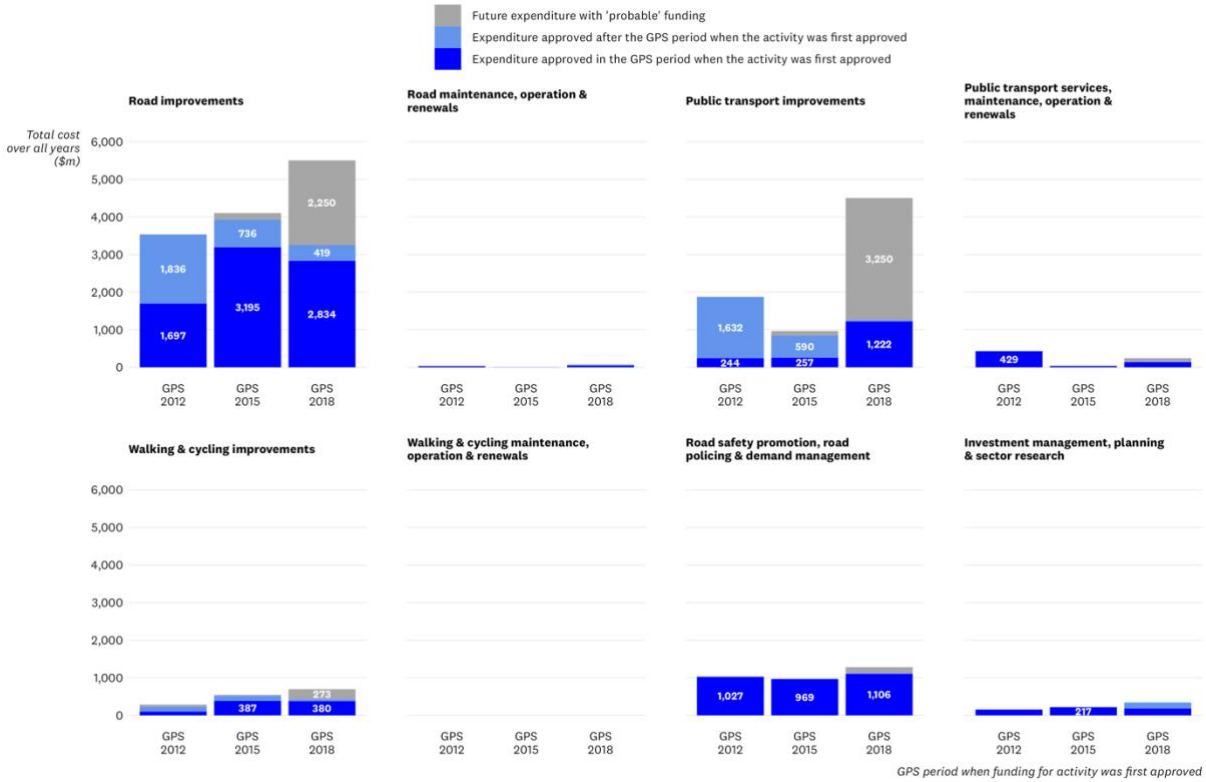

Figure 10 Total approved and planned expenditure for activities first approved in each GPS period by the analysis group. Costs associated with some activities are included in more than one group. Expenditure on baseline activities is excluded.

As explained above, the dollar amounts shown in Figure 10 do not reflect actual expenditure in each GPS period. Instead, these amounts aim to reflect the intent of funding decisions made in each period, including funds that may be spent in future. Actual funding will likely turn out differently from these plans for various reasons, but this analysis aims to evaluate changes in investment decision making driven by GPS 2018.

From Figure 10, it is apparent that:

- There is relatively little expenditure shown in the maintenance, operation and renewals groups due to most such activities being defined as “baseline” activities and excluded from this analysis.
- New funding for road improvements that have been approved was 17% lower under GPS 2018 than GPS 2015. Still, if probable future funding associated with activities first approved under GPS 2018 is included, total funding for road improvements is expected to continue to increase.
- New funding for public transport improvements that have been approved was 40% higher under GPS 2018 compared to GPS 2015 but 35% lower than under GPS 2012. Public transport improvement activities first approved under GPS 2018 also include a substantial amount of planned future funding, suggesting that public transport

investments will continue to grow after the GPS 2018 period due to decisions made in that period.[22]

- New funding for walking and cycling improvements that have been approved was slightly lower under GPS 2018 than under GPS 2015 but was substantially greater than under GPS 2012. Suppose all planned funding for walking and cycling improvements that are not yet approved but have "probable" funding status is subsequently approved. In that case, investment decisions made under GPS 2018 will reflect a gradual increase in such improvements over time (also note qualitative findings in Section 5 that indicate that councils were not necessarily prepared to respond to the additional investments available immediately).
- New approved funding for road safety promotion, road policing, and demand management was higher under GPS 2018 compared to GPS 2012 and 2015.

In addition to the above, it should be noted that rapid transit was introduced as a new activity class in GPS 2018. Data published by Waka Kotahi shows total approved funding for the rapid transit activity class of $63m in total from 2018/19 to 2020/21, of which $20m has been claimed. This compares to an expected funding range for rapid transit in GPS 2018 of between $150m and $760m for this period (cf, Figure 1).

Figure 11 shows the distribution of total costs across improvement activities and all other activities combined. The left panel shows only funding that has been approved (as of April 2022), ie, only the blue segments of Figure 11. The right panel also includes "probable" future funding, ie, the blue plus grey segments of Figure 11. This shows:

- The proportion of funding for road improvement activities first approved under GPS 2018 was lower than under GPS 2015 and was lower than under GPS 2012 if probable future funding is included.
- The proportion of funding for public transport improvement activities first approved under GPS 2018 was greater than under GPS 2015 and was greater than under GPS 2012 if probable future funding is included.
- The proportion of funding for walking and cycling improvement activities first approved under GPS 2018 was less than under GPS 2015 but greater than under GPS 2012.

We note that while some infrastructure investments that are primarily roading focused can include investments in walking and cycling facilities, the design of such facilities may not always be optimal for walking and cycling outcomes. As noted in the evaluation of the Urban Cycling Programme, for example, the requirement to integrate multi modal facilities within a roading project may result in new cycling infrastructure not being well integrated with the existing network plan.[23] Therefore, if the accompanying walking and cycling infrastructure developed is poorly designed or disconnected from existing networks, only marginal improvements in walking and cycling outcomes might be expected, if any. Note that the quality of investments under GPS 2018 is outside the scope of this review.

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[22] Around $2,075m (65%) of this planned future funding for public transport improvements is associated with the "Let's Get Wellington Moving" initiative which was first approved under GPS 2018 and is expected to run from 2019 to 2032, based on information in the 2018-21 NLTP snapshot.

[23] Blewden, M., Mackie, H., & MacArthur-Beadle, S. (2022a). Urban Cycleway Programme 2014-21: Lessons learnt and future direction [Report prepared by Mackie Research and Consulting for Waka Kotahi].

4 TO WHAT EXTENT HAS GPS 2018 INFLUENCED CHANGES IN NLTF INVESTMENTS, IMPLEMENTATION AND EARLY STAGE OUTCOMES?

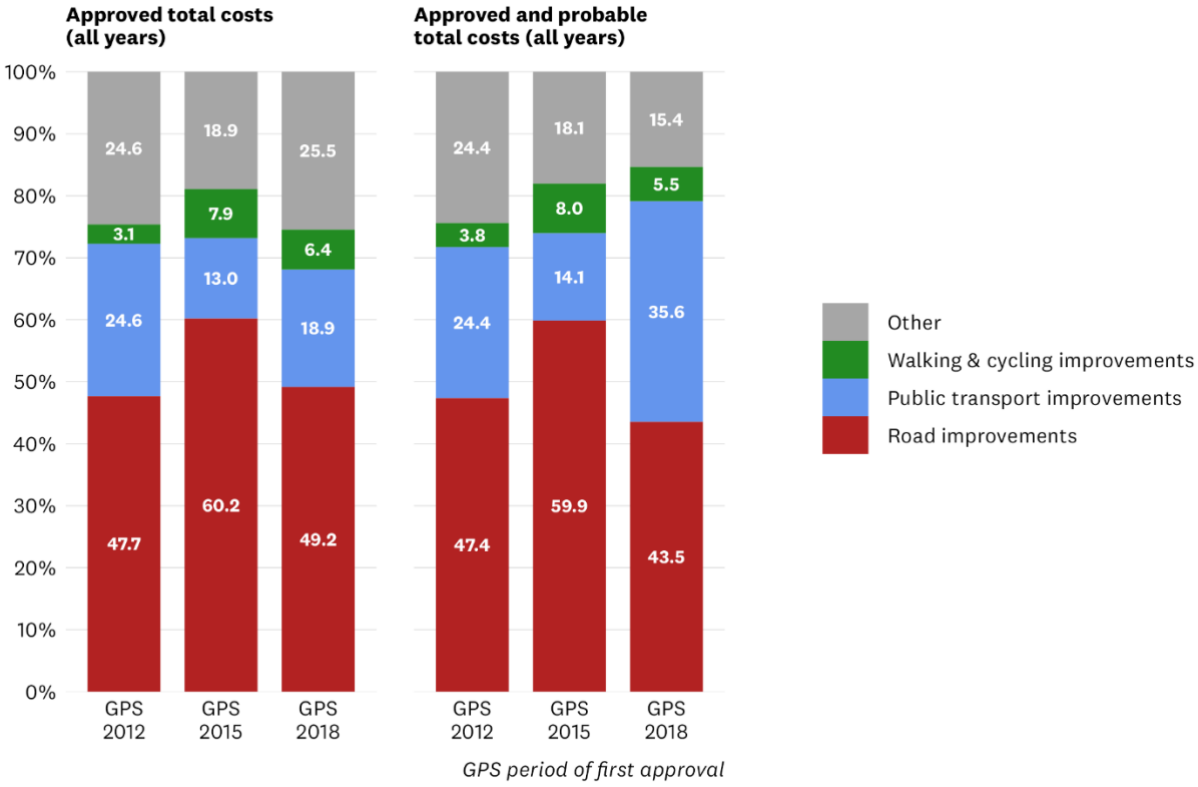

Figure 11 Distribution of total approved and planned expenditure for activities first approved in each GPS period by analysis group

4.5 Detailed breakdown of new funding decisions

Figure 12 further characterises the expenditure associated with activities approved in each GPS period by showing the total expenditure for each activity in the four largest groups. Given the substantial amount of funding for activities first approved under GPS 2018 that has not yet been approved, Figure 12 also shows probable future funding for such activities. Note, however, that for activities first approved under GPS 2012 and 2015, only funding that has been approved is shown.

The analysis shows that funding for these activities in each GPS period is usually characterised by a small number of relatively large investments, accompanied by many smaller investments. There were many more road improvements first approved in each GPS period than public transport or walking and cycling improvements. The pattern under GPS 2018 does not appear to be substantially different compared to earlier periods.

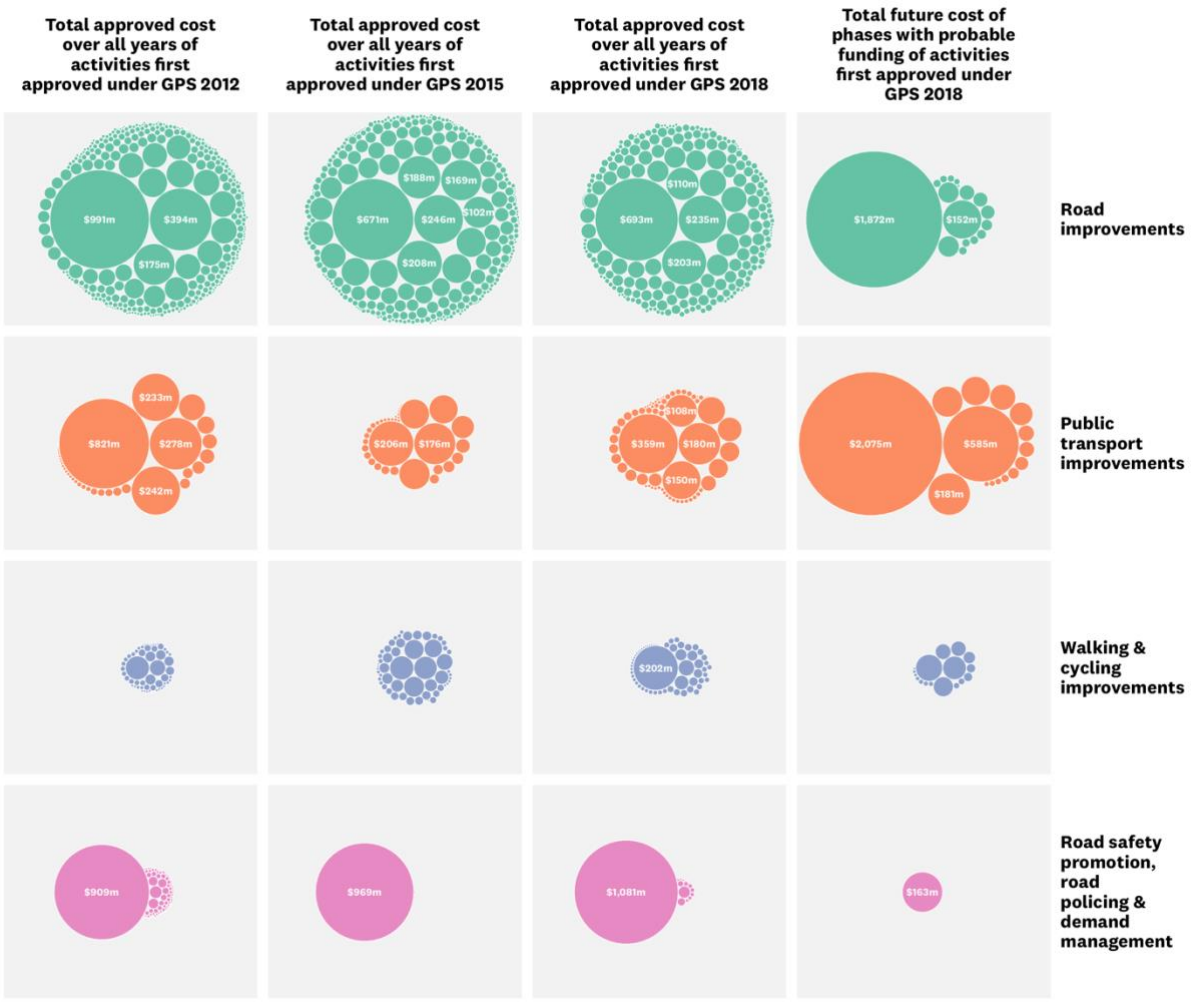

Figure 12 Distribution of total approved and planned expenditure over all years for activities first approved in each GPS period by the analysis group. Some activities are included in more than one group

Figure 13 on the next page illustrates this further by showing the size distribution of funding for improvement activities first approved in each GPS period. As in Figure 12 above, only approved funding (as of April 2022) is shown for activities first approved under GPS 2012 and 2015, while approved and future “probable” funding is shown for activities first approved under GPS 2018. GPS 2018 has shifted towards larger cost activities across all three improvement categories.

4 TO WHAT EXTENT HAS GPS 2018 INFLUENCED CHANGES IN NLTF INVESTMENTS, IMPLEMENTATION AND EARLY STAGE OUTCOMES?

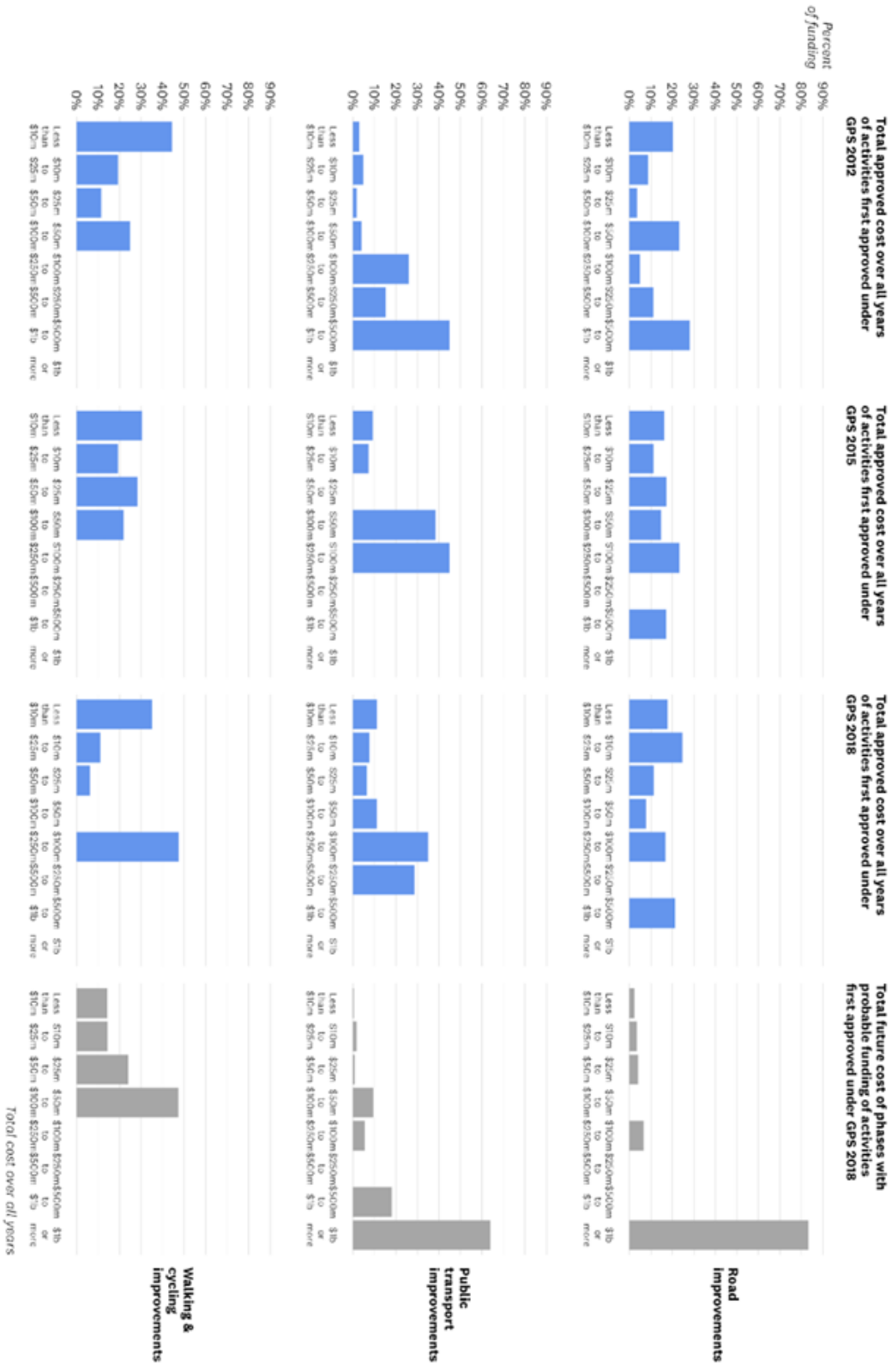

Figure 13 Distribution of funding for improvements activities first approved in each GPS period

4.6 Analysis of national BCRs

A national benefit cost ratio (BCR) is recorded for 580 (32%) activities included in this analysis.[24] For this subset of activities, the analysis described below compares BCRs for transport activities that were first approved under GPS 2012, 2015, and 2018.

The methodology used to estimate transport BCRs has changed over time. Therefore, changes in BCRs reported below may be affected by changes in methodology rather than changes in investment value. Hence, our commentary focuses on differences in BCRs across investments at each point rather than comparing changes over time.

Figure 14 on the next page shows the distribution and cost weighted average of national BCRs for improvement activities first approved under GPS 2012, 2015, and 2018.[25] Among activities first approved under GPS 2018, the weighted average BCRs for walking and cycling and public transport improvements were less than the weighted average BCRs for road improvements. However, the largest improvement activities tended to have lower BCRs. Again, different patterns are seen across types of improvements first approved in earlier GPS periods, with walking and cycling improvements having the highest weighted average BCR among activities first approved under GPS 2015 and public transport improvements having the highest weighted average under GPS 2012.

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[24] BCRs with a value of exactly 1.0 were excluded from this analysis as we understand that this is a default value that is often used when a BCR estimate is not yet available. In addition, the BCR appears to have changed over time for some activities that appear in more than one of the three NLTP extracts used in this analysis. This may reflect updates to the BCR analysis and changes to the scope of the project that changed the BCR. Ideally, the analysis of BCRs would use the estimate of the BCR for each activity that was available at the time the funding for an activity was first approved. However, national BCRs are recorded for only 54 activities in the NLTP 2012-15 extract and 3 activities in the NLTP 2015-18 extract, compared to 920 activities in the NLTP 2018-21 extract. Due to this data limitation, the analysis in this section is based on the *most recent* national BCR recorded for each activity, which in many cases is from the NLTP 2018-21 extract.

[25] Costs include those already approved (as of April 2022) and costs of phases not yet approved that have “probable” funding status.

4 TO WHAT EXTENT HAS GPS 2018 INFLUENCED CHANGES IN NLTF INVESTMENTS, IMPLEMENTATION AND EARLY STAGE OUTCOMES?

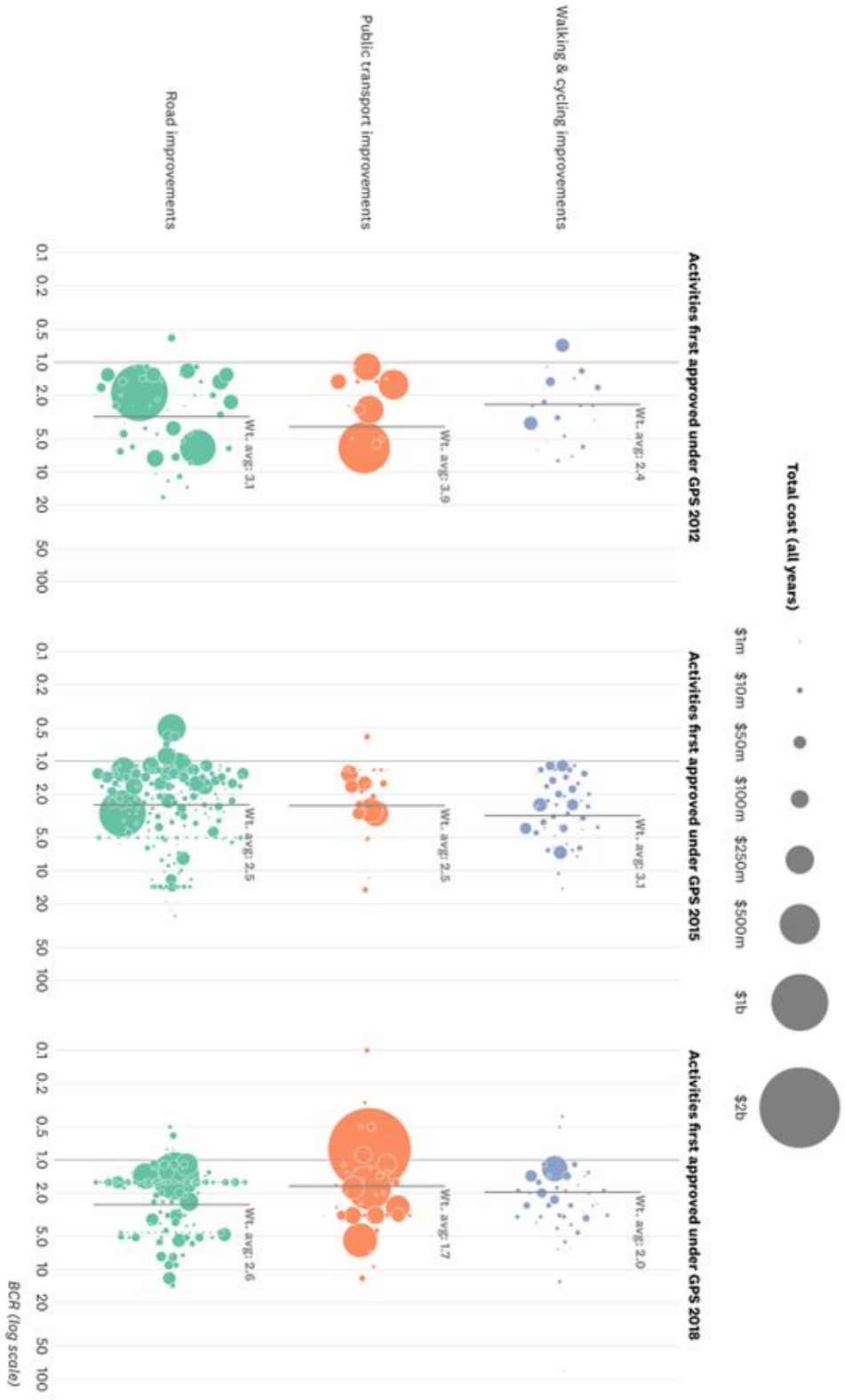

Figure 14 Expected national BCRs for activities by GPS period of first approval and analysis group (improvements activities only). Note some activities may be in more than one analysis group

All weighted average BCRs shown in Figure 14 above is greater than 1 (ie, estimated benefits exceed estimated costs) across all three types of activity in all three GPS periods. Still, a small number of activities with approved funding had BCRs of less than one. Figure 15 details the distribution of approved and probable future expenditure by type of improvements activity and GPS period of first approval. For example, the large proportion of public transport improvements expenditure with a BCR of less than 1 for activities first approved under GPS 2018 relates to the public transport components of the "Let's Get Wellington Moving" initiative (estimated BCR 0.8 in the 2018-21 NLTP). We note that most of this expenditure is probable future funding that has not yet been approved (as of April 2022). Similarly, the large proportion of road improvement expenditure for activities first approved under GPS 2018 that has no BCR recorded also relates to the road components of "Let's Get Wellington Moving", which is the most probable future funding.

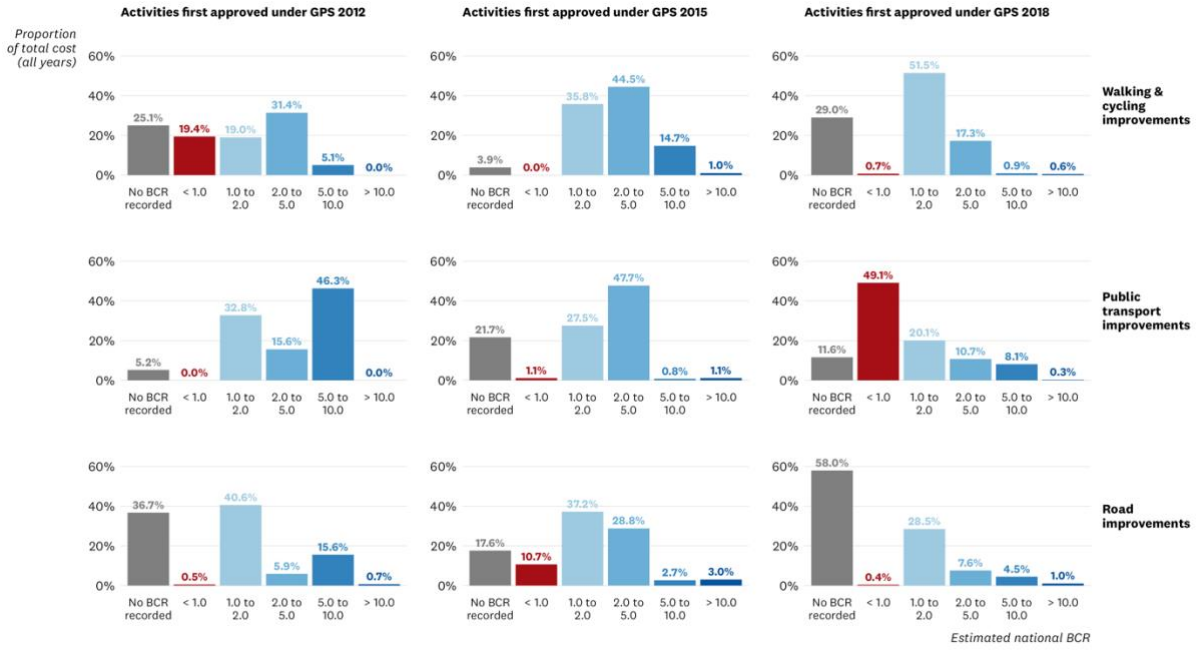

Figure 15 Distribution of total approved and probable funding across BCR ranges by GPS period of first approval and analysis group (improvements activities only). Expenditure associated with some activities may be in more than one analysis group.

Alignment of investments with GPS priorities

As noted above, BCRs are just one factor influencing investment decisions, and the degree of alignment with GPS priorities is another key consideration.[26] Figure 16 shows a breakdown of investment approvals by activity class under NLTP 2018-21 by priority ordering based on the combination of GPS alignment and BCR. The definitions of the six priorities are shown in Table 2.[27]

[26] For NLTP 2018/21, this was known as “GPS results alignment”. Earlier NLTPs used the similar concept of strategic fit in investment prioritisation.

[27] The percentages shown in Figure 16 are calculated from data provided by Waka Kotahi as part of the GPS 2018 annual reporting. Similar data is not available for GPS 2012 or 2015.

4 TO WHAT EXTENT HAS GPS 2018 INFLUENCED CHANGES IN NLTF INVESTMENTS, IMPLEMENTATION AND EARLY STAGE OUTCOMES?

Across all activity classes, 43% of approved investment expenditure was assessed as having one of the three highest priorities. In general, approvals within the walking and cycling and public transport activity classes tended to have higher priorities than approvals for local roads and state highway investments.

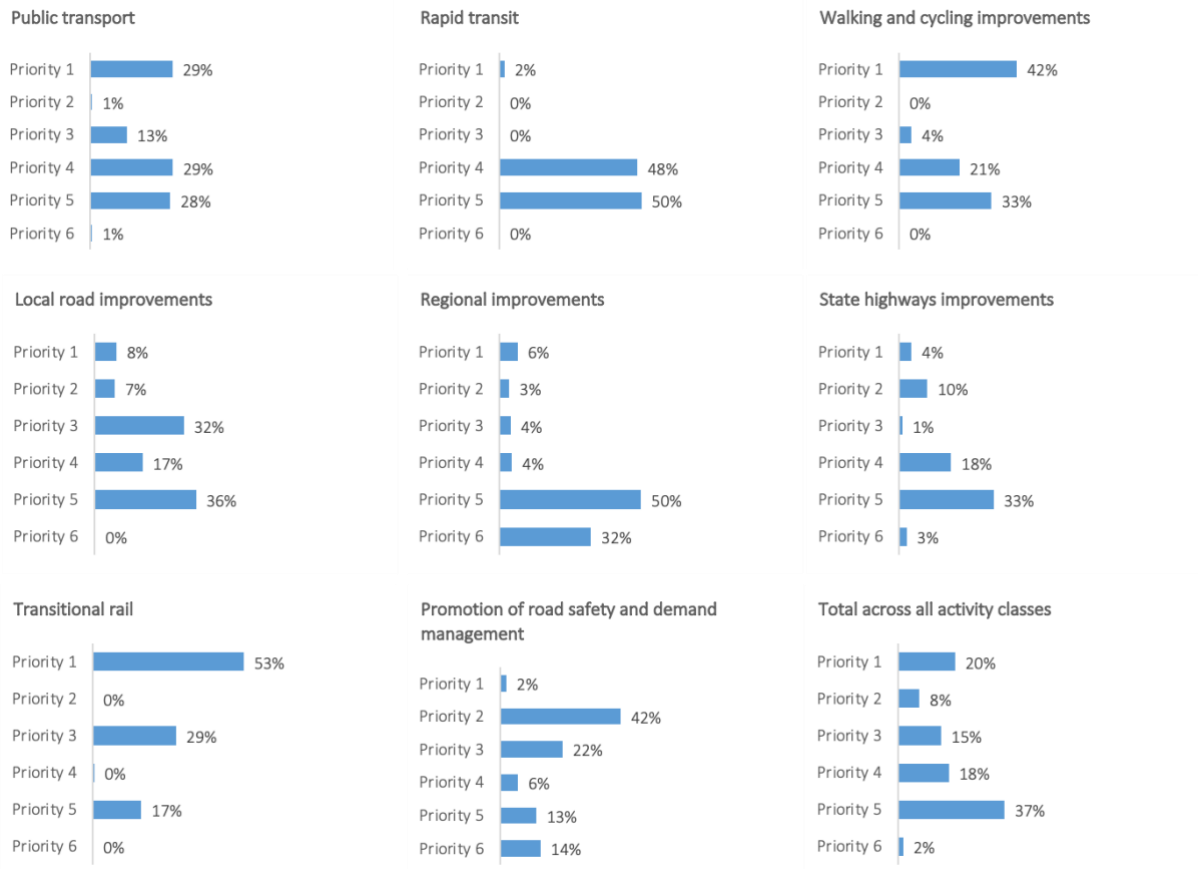

Figure 16 NLTP 2018-21 investment approvals (% of total expenditure in each activity class) by priority based on the degree of alignment with GPS priorities and BCR (1 = highest

Table 2 Definition of priority orders shown in Figure 16 (Waka Kotahi investment prioritisation framework)[28]

Priority	Results alignment	Cost-benefit appraisal
1	Very high	Low / Medium / High / Very High
2	Low / Medium / High	Very high (BCR 10+), PV EoL[29]
3	High	High (BCR 5-9.9)
4	High	Medium (BCR 3-4.9)
5	Medium	High (BCR 5-9.9)
6	High	Low (BCR 1-2.9)

4.8 Changing the transport conversation

Consistent with Waka Kotahi accounts[30] and the quantitative analysis undertaken for this evaluation, interviewees described GPS 2018 as signalling a broader approach to land transport investment than was evident previously. Identified shifts included an increased focus on alternative modes and greater consideration of social, environmental, and economic outcomes. In addition, sector stakeholders and government officials both recognised that greater attention was being given to urban form strategies, as part of a more integrated investment response, for example:

> [*GPS 2018] changed the conversation…[the] narrative is different around transport investment, it needs to support a better urban form which can support more housing…more density, shorter trips* (Sector stakeholder)

Sector stakeholders described the introduction of new activity classes. They recognised that GPS 2018 had signalled a greater focus on walking, cycling, rail, and rapid transit and a wider range of intended outcomes. Government officials described GPS 2018 as a catalyst for rethinking how land transport investments could be used to address transport priorities. For example, GPS 2018:

> *…signalled a very different conversation about the land transport system …particularly focused around mode shift, what it means to take mode neutral decisions … [what is the role government should] play in contributing to a low carbon system …supporting people to have choices beyond getting in their car* (Government official)
>
> *[GPS 2018 represented] a cultural shift in the way that we view and value transport infrastructure …much wider consideration of the benefits that could arise from this particular investment* (Government official)

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28 https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/archive/201821-nltp/2018-21-nltp-investment-assessment-framework-iaf/prioritisation-of-activities/

29 Present Value End of Life

30 https://www.nzta.govt.nz/planning-and-investment/funding-and-investing/investment-decision making-framework-review

4.9 Importance of budget allocation and increase in activity classes

Several interviewees identified the investment allocation to each activity class as a key determinant of the system response to any GPS, not surprisingly, funding requests tended to "follow the money". In this regard, allocations were described as "forcing" change through clearly signalling investment priorities:

> *GPS has strategic section at the front …funding information at the back …the only bit that people look at is the bit at the back* (Sector stakeholder)

> *Activity classes …kind of force change in a way that perhaps the strategic direction and priorities and objectives [don't]* (Government official)

GPS 2018 introduced additional funding and two new activity classes in alignment with broader transport outcomes. Some interviewees considered this a positive development. For example, previous underfunding in some classes had historically necessitated "backdoor" investment via other classes, reportedly common to walking, cycling, and public transport:

> *…work categories [were created so] bus lane projects [could] be funded from local road activity class …probably [the] same for cycle lanes …cycleways next to motorways [were] funded that out of the state highway improvement activity class* (Government Official)

> *as walking and cycling and public transport got more funding in their activity classes …finally we can fund these projects out of a more appropriate activity class* (Government Official)

However, the same official above suggested that with investment shifts, allocations to walking, cycling, and public transport classes were now being drawn upon for other activities:

> *…arguably the reverse [is now happening] …funding stuff out of public transport, walking, and cycling activity classes that should …be funded from state highways or local roads* (Government Official)

Some interviewees saw the increasing scope of investment as having the potential to undermine overall system performance, primarily because the investment was now spread over more classes. While agreeing with the need for a diversity of investment, a government official noted this risked excessive pressure on local authority capacity and capability as they sought to deliver an increasing range of services:

> *…maybe [you don't] get the highest level of impact that you may want when you're spread thin* (Government official)

Other concerns expressed about the increasing scope of investment were the potential to reduce the investment focus on existing assets and, through the increased investment to other modes, a reduction in the percentage of road user charges returned to motorised road users. According to one stakeholder, the investment system had previously been "fairly tidy" but "lost a lot of focus." One interviewee observed that with increased investment in other modes, the GPS influence was being redirected away "from the majority of users" and those "actually using and paying for the system".

The same interviewee above also attributed funding pressure to the increased investment in walking, cycling, and public transport. Current scope extended beyond the primary historical focus on the continuous programme, maintenance, and renewals:

> *…a huge amount of money trying to retrofit our streets …putting lots and lots of money into walking and cycling …all coming from that same pot …that causes the issues around achieving the outcomes of the GPS* (Government official)

Another official saw risk in the GPS becoming increasingly aspirational, reaching beyond what could feasibly be achieved through the change levers available via land transport investments alone. For example, reflecting on other key determinants of mode shift, this interviewee commented:

> *… we can't change the economic wellbeing of New Zealand …the unemployment rates …there is diminishing value in putting really big weighting on land use change when that's such a tiny proportion of our business to make an impact on* (Government official)

This position reflects the view of another official who saw the need for a more whole of system approach, which better integrated land transport investment with other change levers.

4.10 Impact of GPS 2018

4.10.1 Investment responses

Several interviewees were limited in distinguishing between investment planning, decision making, implementation, and outcomes shifts. This reflects the difficulty of attributing specific impacts to a specific GPS when the system is more typically experienced as a continuous complex process comprising successive, overlapping GPS. Nonetheless, several consistent themes emerged from interviewees' accounts of investment responses attributable to GPS 2018:

- An obvious diversion of investment away from state highway improvements, which was done deliberately to redirect funding away from several large urban highway projects that were largely developed and close to being implemented, and little notable shift in investment to local road improvement.
- Common recognition that GPS 2018 had signalled a greater focus on cycling, walking, public transport, and rapid transit investment.
- Within larger roading projects, greater attention to alternative and multi modal solutions is noted, for example, by adding walking, cycling, and public transport facilities to local roads.
- Increased attention to urban form and access to housing as part of a more integrated investment response.
- Some described increased investment to maintenance activity classes as an important catchup following previous underinvestment.
- A new emphasis on safety investments, including Road to Zero and safety improvements on the State Highway network.
- Maintenance investments mostly contribute to access and value for money outcomes.
- Resilience projects (eg, bridge replacements, seawalls) are typically funded under access. However, there was seen to be reduced investment in resilience overall, which was seen by some as potentially increasing strategic risk across the network.
- Review and revision of the Investment Decision Making Framework (IDMF, see later detail).

4.10.2 Environmental responses

Several government officials described how GPS 2018 had required new thinking about the contribution that land transport investments could make to emission reduction and environmental outcomes. One suggested the GPS had not led to any investments primarily addressing these outcomes, rather, the GPS had, more importantly, provided the strategic mandate and legitimacy for the investment system to have a greater environmental focus overall.

Another noted that maintenance investments provided a limited opportunity to contribute to environmental impacts, although State Highway projects could contribute, for example, through stormwater management and planting enhancements.

Beyond obvious investment responses under walking, cycling, and public transport, another official noted that other possibilities were generally of low value (eg, LED street light replacements) or implicated responses not historically anticipated under the NLTF, one

example discussed was the potential to drive change via the vehicle fleet through investment in electric vehicle charging infrastructure and the conversion of the heavy vehicle fleet to electric. They noted that footpath improvements had been signalled as appropriate via the NLTF and that this had lifted direct investment in walking.

4.10.3 Ongoing perceived outcomes

Several interviewees described later, or more recent, outcomes that they believed could be attributed to GPS 2018. These reports reflected the time lags across GPS, often referring to emerging activity pipelines or areas of focus within GPS 2021 proposals. Reports were also often at a higher level and are perhaps most useful for illustrating interviewees' understanding or perceptions of GPS 2018 impacts rather than necessarily being full or detailed descriptions.

A government official noted that the development of national and regional mode shift plans had been a direct outcome of the mode shift priorities in GPS 2018. The development of these plans was unprecedented, and the plans were considered to have been key to the more recent delivery of cycling and walking infrastructure in larger urban areas, and other initiatives such as the Northern Busway and better use of dedicated bus networks on both state highways and local roads.

Reflecting on the time needed to reorientate the delivery system in response to GPS 2018, several interviewees described an increased focus on walking, cycling, public transport, and rail initiatives within 2021-24 RLTPs. Consistent with these comments, one government official noted that some councils were not prepared to respond immediately to these shifts in 2018. Capacity and capability development were necessary first steps. Similarly, another official noted that GPS 2018 had supported renewed attention to passenger rail as a first step in the planning and delivery response.

> *…now starting to get people talking about passenger rail again on the main line …2018 [GPS] and the subsequent 2021 reinforcement [assisted] those conversations* (Government official)

GPS 2018 sent an important signal that future funding would depend on ensuring projects were focused towards these areas, leading to them being better prepared for GPS 2021.

Several interviewees described observable shifts towards a more integrated, programmatic approach, reflecting the emphasis in GPS 2018 towards joined up solutions. A common example gives increased attention to urban form, liveability, movement and place strategies within programmes such as "Let's Get Wellington Moving" and "Access for All" (Auckland). A government official also described ongoing work to support investment in demand management strategies and programmes of smaller connected activities that would deliver multiple outcomes.

> *…big shift in the last two GPS …away from projects 100% NLTF funded …more reliance upon local share funding, tricky stuff like taking away carparks to build cycleways* (Government official)

A sector stakeholder was encouraged by the more recent focus on reducing motor vehicle travel and recognition that this was a critical area for future transport investment. The Emission Reduction Plan had been a key driver of this. However, it was seen as a plan built upon the shifts signalled in GPS 2018.

- *[Under the ERP] …20% cut in VKT as a goal by 2035 …clear that for the first time, the Government understands that in the future we need to drive less to meet our climate and liveability goals* (Sector stakeholder)

Finally, others saw GPS 2018 as a prelude to the renewed commitment to Road to Zero and the current safer speed programme, GPS 2021 was noticeably stronger in its emphasis on road safety, although this may have also been due to Ministers looking to send stronger safety signals in 2021.

- *…[an] increased emphasis on safety …Road to Zero …proposals for setting safer speed limits* (Sector stakeholder)

4.10.4 More integrated investment response

As noted, GPS 2018 was a catalyst for new thinking about the role of the GPS and NLTF within a wider set of change levers and revenue sources. A government official reported that work had continued further defining more integrated, programmatic investment responses. Informed by this work, the Emissions Reduction Plan[31] identified the need for VKT reduction programmes within the next NLTP, GPS 2024 was also expected to continue the momentum towards a more joined up investment approach:

> *…that's the change that we're now trying to drive …how do we better think about what the best mix of interventions is for a place to deliver the outcomes that we're seeking, and we need to do that in a more delivery programme based approach than we have done in the past* (Government official)

> *[Ensuring] critical dependencies …[are] identified so value for money isn't squandered because there aren't those supporting mechanisms around managing demand through urban form and other measures* (Government official)

Note, however, that another official suggested that after the more aspirational GPS 2018, the land transport investment system now needed to move back towards a more feasible scope:

> *…probably [now need] to bring it back into what we can deliver against … [It's] great having ambitious statements of intent, but the funding that underpins that and activities that relate to that funding are very definitive, and the remit of what they can do is limited …from the [road controlling authorities'] perspective there are limitations on what the State Highway can do* (Government official)

4.10.5 New investment decision framework

Consistent with Waka Kotahi accounts[32], interviewees noted that GPS 2018 established an expectation of a significant review of the Investment Decision Making Framework (IDMF) and business case approach.[33] The review conducted in 2019 led to an updated IDMF,[34]

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31 Ministry for the Environment. 2022. Te hau mārohi ki anamata Towards a productive, sustainable and inclusive economy: Aotearoa New Zealand's first emissions reduction plan. Ministry for the Environment, 16 May 2022https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/

32 https://www.nzta.govt.nz/planning-and-investment/funding-and-investing/investment-decision making-framework-review/

33 Under the Strategic Priority Value for Money GPS 2018 stated that the appropriateness of current economic evaluation approaches should be prioritised to ensure they are fit for purpose – eg, account for the full range of costs and benefits.

34 This included updated investment policies, processes, tools, and guidance, including updates to the business case approach, criteria for prioritisation and assessment, and evaluation methodologies.

implemented in June 2020 in time for the 2021-24 NLTP (while also applying to new business cases commencing after 30 June 2020).

Government officials noted that limitations in the existing business case approach became increasingly apparent through GPS 2018. The shifts signalled reinforced the need for BCR analysis to include a wider range of values and be complimented with non monetised benefits. For example, it was noted that under the existing approach, safety projects that reduced speed generally struggled to achieve a sufficient BCR, as higher monetised benefits were attributed to reduced travel time and vehicle operating costs or conversely seeking high BCRs for small risk reductions at low cost that did not address the priorities of reducing fatal and serious injuries.

Reflecting on the new IDMF on current practice, a government official reported that a much broader range of criteria was now being used to assess value and benefits. A BCR was now only "one component of what we think about", greater attention was now given to strategic alignment and non financial impacts. This interviewee commented:

> *I think we're [now]…making much more deliberate choices about the way we deliver multiple outcomes, not just sort of charging off to pursue a single outcome…*
> (Government official)

4.11 Case study: Auckland RLTP

4.11.1 Alignment with GPS 2018

The Auckland Regional Land Transport Plan 2018-2028 was notable for its strong alignment with GPS 2018. From the outset, the plan notes its requirement to be consistent with the GPS and specifically acknowledges the four strategic priorities of safety, access, environment and value for money, and the accompanying objectives.

Specific details regarding challenges that Auckland faces around safety, accessibility, environment and value for money are noted alongside other challenges, such as growth and freight. These are further reflected in sections detailing plans to address these challenges and asset maintenance. Finally, specified measures and targets are adopted around each of the four strategic priorities.

The RLTP also reflects the context of the Auckland Plan, detailing the strategy for Auckland's growth over 30 years, the Auckland Transport Alignment Project (ATAP), the National Energy and Conservation Strategy 2017-22, Māori outcomes, and Auckland Transport Māori Responsiveness Plan.

4.11.2 Influence or alignment?

The RLTP could pick up a stronger emphasis on public and active transport, reflecting the priority of the GPS towards transport choice and access, and also aligned strongly with the environmental priority. However, interviewees for this case study noted that there had been strong policy directions in the region for some time, reflected in the intensification directions of the Unitary Plan, the region's growth and the City Rail Link.

Furthermore, the ATAP process preceded the RLTP and established a "government to government" agreement on key transport priorities for the region between the central and regional governments. GPS 2018 had been designed from the outset to reflect ATAP, which we understand is a relatively rare situation where a policy position (ATAP) is timed to occur with the GPS cycle. A key outcome of ATAP was the establishment of the regional fuel tax,

which significantly contributed to transport funding for the region and enabled additional investment in the transport priority areas.

> *The intent of ATAP was that it would be an agreement between Council and Government on how much funding was available and then where that funding should be aligned. It was intended to influence not only the RLTP but also the NLTP, the Auckland Plan and the GPS.*

Similarly, GPS 2018 enabled a significant increase in safety investment. However, this also reflected a longstanding concern with crashes, deaths and serious injuries, which had peaked in 2018.

The alignment of the RLTP with the value for money dimension of GPS 2018 was principally seen as occurring through its prioritisation process, which is intended to select the projects that best deliver outcomes from the investment available. This is supported by alliancing processes on key projects and procurement approaches that similarly seek efficiencies and a range of outcomes related to the RLTP priorities.

These developments suggest that the influence of GPS 2018 was a more complex relationship that reflected interactions between central and regional government over some time and reflected an alignment of priorities between Auckland Council and Government that both the GPS and the RLTP were able to adopt. They reflect evolving transport priorities, set in the context of international shifts in planning and urban design that focus on the intensification of cities, mixed use development, and a shift towards offering greater transport choice through public and active transport mode investment.

> *I wouldn't necessarily describe the GPS on its own as causative. It's more like it enables things that may already be there…*

The key funding shifts established by the RLTP were a larger proportion of funding being directed towards public transport, active modes and safety, with relatively less funding going to roading and corridor projects.

Together, the GPS and the RLTP provided an aligned direction and jointly agreed on policy objectives, which together provided funding signals to Waka Kothai to support investment in prioritised initiatives. For the most part, the view of interviewees was that these signals were subsequently acted upon in investment decisions.

4.11.3 Areas of tension between national and regional priorities

Interviewees noted that, at times, national priority projects could drive investment decision making and reduce funding available for regional initiatives. For Auckland transport planners, one key area of tension is an investment in maintenance and renewals, comprising 40% of the capital budget, where it was argued less is being invested compared to that signalled by asset management projections. Failure to invest in renewals in a timely manner generally increases the costs of renewals over time.

A challenge noted of the GPS process is the relatively short term funding signals that it sends, during a ten year RLTP process, and alongside a 30 year plan guiding the region's development. Some funding certainty was seen to be needed to enable the delivery of regional priorities and to overcome ongoing challenges of reprioritising the face of funding constraints.

Tensions also emerge in areas of housing growth, where active/public transport investment typically lags the construction of housing developments, whereas planners wish to see a greater front loading of these investments early in the development process.

Benefits realisation is an area under development, with the intention that over time, the benefits of key projects will be tracked and reported. It was also noted that BCRs tend to have a lower influence on RLTP prioritisation than previously, while they were included in the assessment methodology in 2018, they were not included in the 2021 assessment methodology, with delivery on prioritised outcomes holding greater influence.

4.11.4 Looking ahead

A lesson of the 2018 GPS was that it was delivered in an environment where there was in place an established groundswell of support for the investment direction proposed. If a GPS is incompatible with the goals of a region, it will be less likely to achieve its aims, as councils are unlikely to have projects in line for funding and will not wish to seek match funding through the NLTF. For a GPS to have a substantial effect, it "needs to fall onto relatively fertile ground." This requires a process of building a case for change that councils can take on board.

One area highlighted by interviewees as a potential area of GPS development is integrated spatial planning. There was seen to be value in future GPS signalling desired spatial outcomes and, in turn, enabling greater investment in transport planning that connects and supports outcomes in the economic, health, environmental, social and educational spheres. These could be supported by an "infrastructure alignment plan" with a broader scope than a "transport alignment plan." Such opportunities were seen to offer the potential for greater value for money from transport investment in the future.

5 What are the key factors that affect the efficiency and effectiveness of converting inputs to outputs and hence to outcomes?

5.1 Key themes

GPS 2018 was relatively disruptive compared to the previous GPS. GPS 2018, therefore, required a range of system changes and shifts in capacity and capability that are still in progress and are yet to fully bed in.

New priorities developed through GPS objectives, therefore, need to be sustained over time if the shift in investment and outcomes are to be realised. Feedback indicates the new GPS priorities required new mindsets and skillsets to implement the investment shifts signalled. One official believed this had contributed to some turnover in the government sector.

Some interviewees described an increasing scope of investment as creating funding pressures with the available resource now spread thinner, some also described this as potentially undermining the overall impact of the GPS. However, a benefit is that alongside increased investment in walking, cycling and public transport, there are now appropriate activity classes that align with a range of transport objectives.

Due to the change in government, GPS 2018 was finalised later in the planning cycle, meaning that apart from Auckland, there were few meaningful opportunities for RLTPs around New Zealand to respond. It was reported by some that many existing planned projects were redefined to fit new funding priorities rather than these projects changing substantially.

A range of broader factors that highlight the complexity of the transport system was seen to be either enabling or acting counter to GPS objectives, which can ultimately affect outcomes:

- Impact of rising fuel prices on behaviour change
- Impact of the COVID-19 pandemic on behaviour change (eg, public transport mode shift)
- Increasingly, transport related funding outside of the GPS and NLTP, such as through direct Crown funding. There was a view that such investment reflected the fact that the funding available from the NLTF was insufficient to address transport investment needs and the government's policy priorities

5.2 GPS disruption and continuity

The degree of stability in investment priorities over successive GPS was described by several interviewees as a factor impacting system efficiency. A sustained period of relative stability enabled system capacity and capability to be developed with confidence, leading to

momentum within the system. The reasonably rapid rollout of the Roads of National Significance (RoNS) programme, under earlier GPS, was cited as an example:

> *[One] GPS alone possibly can't do that much in [the short term] …maybe over [the longer term] it can if it's consistent…like the RoNS focus was very consistent over multiple GPS…[this] directed a huge proportion of NLTF investment into a set of projects* (Government official)

Reflecting on the above, several interviewees reported that the disruptive nature of GPS 2018 had resulted in some initial loss of system efficiency, primarily because of the level of system adaptation required. For example, some turnover in the government sector was attributed to GPS 2018, given the need for new mindsets and skillsets.

> *…people who [were] used to building new roads, they had to shift to managing a project that was achieving a safety outcome, or it was achieving a multimodal approach …[There was a] huge turnover in staff at our own organisation just because they weren't getting the big road building projects and they were required to do something different and either it wasn't a good fit for them, or we required new skills* (Government official)

On the demand side of the system, a government official noted that GPS 2018 had provided some discretion for officials to come up with the "right mix" of activities under the broad outcomes of safety and access. The degree of discretion was described as somewhat unprecedented, meaning that officials had limited historical precedents to guide their responses to the document. Interpreting and then articulating appropriate responses took time and careful deliberation, given the wide scope of activities potentially eligible for prioritisation:

> *…what did it mean to have a reduced focus on state highway improvements? What did it mean to have an increased focus on walking and cycling?* (Government official)

> *[We had to] figure out what were the priorities within the priorities …what [did] it meant to support mode shift [to define specific] aspects of access …otherwise, it's everything* (Government official)

Interviewees also described some stall in supply side momentum, as the market also sought to understand and then adjust to new priorities, for example:

> *In 2018 …the transport planning world [was turned] upside down …any efficiencies you might think that you've got…[went] out the window* (Government official)

> *You've got to change the industry's response …moving from large projects to small projects …it takes a lot of people's time to get their heads around it* (Government official)

Noting the investment data findings of an initial decline in walking and cycling funding, this may be due to some councils not being sufficiently advanced in their planning to take advantage of walking and cycling investment opportunities. This may also indicate the difficulty of turning a broad agenda for walking and cycling into reality.

> *…some Councils weren't ready for a funding boost in walking and cycling and public transport…[they] didn't have good projects ready to go* (Government official)

> *…massive change …has a ripple effect …it was only partway through the 2018-21 period that we started to get our feet under the table and get the pipeline moving* (Government official)

5.3 Relationship between GPS, NLTP, and RLTP

Interviewees noted that under standard practice, RLTPs are finalised following the release of the GPS, with timeframes enabling a strategic response at the regional level. However, due to the change of government following the October 2017 election, GPS 2018 was finalised relatively late in the RLTP and NLTP planning cycle. Because of this, and except for Auckland,[35] there had been limited time for meaningful responses within RLTPs. The time officials needed to interpret the GPS may have exacerbated timeframe pressure. For example, one official noted that while GPS 2018 had led to a critical discussion by officials, there had been limited time for this to influence RLTPs materially:

> [*This] essentially just means that there [was] no significant change in what's being invested in to align with the different focus of the GPS. You're just rebranding. Whereas given …the year that we ideally give Councils to write an RLTP that is aligned with the GPS, they will be much more strategic …about what activities they're bringing forward* (Government official)

Following the above, several interviews noted that many existing projects were defined or described to fit GPS 2018 priorities rather than projects changing substantially. One official, therefore, described the GPS as having had the most influence within the local planning of existing (rescoped) projects:

> *It is at the planning level where importance is identified …then finding a way to do it within the activity class structure* (Government official)

Other comments further illustrate the rescoping process:

> *Councils pick up the strategic priorities in the GPS …just relabel activities…already in their pipeline …eg, [rebrand] a separated cycle infrastructure [project] …from primarily a safety issue … [to an] access [project]* (Government official)

> *Everyone finds a new box that the same project can now tick …what if we do slightly wider shoulders to this motorway and say that we could potentially run buses on them in the future? Now it's a multimodal project…we can tick that GPS box even though we haven't …changed our project at all* (Government official)

One official observed that the rescoping and selective investment of specific local projects to fit national priorities could disrupt the overall coherence of RLTPs:

> *…RLTPs provide a cohesive region wide approach … [the investment system prioritises] bits under each activity class on a national basis …bits would get included, but then they don't get a cohesive [regional] whole* (Government official).

Another official noted that the three year cycle of the GPS was inconsistent with the longer term timeframes under which RLTP were planned and approved:

> *…reality is that the GPS and the levers that they want to pull for whatever reason at a political level change every three years …whether we like it or not, the strategic direction of a GPS is not much longer than three years ….at a regional level if you're saying we want our transport network to look like X in 15 years' time, you actually start planning those projects 10 years out* (Government official)

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[35] Due to the relatively late development of the RLTP.

Similarly, a government official described how the three year cycle could impact funding security and certainty, and therefore momentum, within the continuous programme:

> *…continuous programmes are there for a continuous reason …not necessarily something you want to stop and think about every three years …everything sort of hits a hiatus until the funding can be approved …deliverables [can] is deferred and delayed* (Government official)

One interviewee felt the GPS process should be more responsive to the regional strategic direction established at the RLTP level and the timing of regional activity management plans. The researchers understand that work is currently underway to enhance alignment between these respective planning inputs, to achieve a more standardized approach, and to balance bottom up and top down influence over regional investment decisions.

5.4 Impact of the continuous programme

Consistent with the quantitative analysis, several interviewees recognised that a relatively small proportion of the investment under each GPS was available for discretionary investment. Baseline commitments are significant, including the continuous programme,[36] debt repayments, existing funding approvals and activities from previous GPS, and investment to maintain existing levels of service.

As the land transport system increased in size faster than available funding, an increasing proportion of the NLTF was needed just to "keep the lights on." One interviewee noted that for rural road controlling authorities, most of the investment was via the continuous programme, thus limiting the strategic relevance and impact of the GPS for rural areas. For examples:

> *[In the context of a] huge rural roading network…the issues are not about getting people out of cars…the issues are all about replacing wooden bridges* (Government official)

> *the biggest issues… [in rural region] are roading infrastructure projects…not about putting people onto buses… [there are not] thousands of people to put onto bikes…when you have a very strong focus in that line… [you are] disenfranchising…that part of the country, you're taking away their ability to actually make progress in [their priority] areas* (Government official)

One sector interviewee noted the ongoing pressure that existing services face in the current economic environment and the pressure this will place on the continuous programme in the future:

> *Given the post COVID impact on PT patronage, the slow recovery and the impact on revenue from PT fares, sustaining PT services at current levels is not affordable. The future GPS will need to consider providing additional OPEX funding to continue maintaining existing services and introduce new services.* (Sector stakeholder)

Reflecting on the above, some interviewees saw recent Crown investments (outside of the GPS) in transport as indicative of the investment pressure.

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[36] "Continuous programme" is a term that was frequently used by interviewees. For the purposes of this report, continuous programme refers to a range of non discretionary funding commitments, such as maintenance programme and public transport services.

> *The NLTF [alone] can't do what we need the Land Transport system transformation to do* (Government official)

> *Increasingly… [it is] outside the GPS process and NLTF process that the Government has made its big calls on transport…City Rail Link…climate response fund* (Government official)

Looking into the future, one official suggested that future GPS could be increasingly focused on continuous programmes, with improvements increasingly funded via direct Crown investments.

> *…NLTF could be scaled back to being a fund that provides for maintenance and renewals…not building new motorways…there are still going to be areas where we have to spend money on infrastructure* (Government official)

Some officials also felt that the continuous programme, including maintenance, could be more explicitly aligned to GPS objectives, thus increasing the overall impact of the investment on desired outcomes. Our analysis suggests that around 45 to 50% of NLTP funding (from Waka Kotahi and local authorities combined) is committed to "baseline" activities such as maintenance and ongoing public transport services (see Figure 9, page). A further 30% is typically committed to activities started under a prior GPS, leaving only around 20-25% of the funding available to support new activities during a three year GPS period. However, the strategic focus was on system development and improvements. These officials reported that less attention had been paid historically as to how the continuous programme could be better used to lever change. For example, a recent analysis of maintenance investments confirmed an underperformance in contribution to outcomes relative to the proportionate size of the investment:

> *The GPS has probably not historically put an emphasis on existing assets may be as much as it would have the other more ribbon cutting orientated investments* (Government official)

> *[We focus less] on the bulk of our programmes, maintenance operations and renewals and public transport …we tend to miss that, there's not a lot of guidance on those programmes …from the GPS* (Government official)

However, officials also noted there were natural constraints on the extent to which maintenance investments could be tailored to enhance the contribution to broader GPS outcomes, with the contribution expected to continue to be most significant under access.

5.5 Relationship with RLTP

Several interviewees described system performance issues in the relationship between GPS 2018 and RLTPs. Issues raised included the politically determined three year timeframes of the GPS compared to the longer term planning timeframes required for RLTPs (as noted earlier), a perceived disconnect at times between regional and national priorities, and perceived inequities in GPS relevance and benefits delivered to urban and rural areas respectively. One interviewee illustrated these issues through the example of rural bridge replacements. While critical to regional resilience, national priorities were directing investment priorities elsewhere. However, this need "doesn't go away." The overall dynamic reported was "more money going to a few urban areas…less money in the rural areas."

...there was some feedback that sometimes the high priorities for [regions] weren't high priorities for [government] (Government official)

5.6 Social licence/community support

The impact of community opposition on momentum and outcomes in the delivery of cycling infrastructure is well documented.[37] For example, social license for the direction and priorities established under the GPS was identified by one interviewee as a factor particularly impacting investment momentum in walking and cycling investments that required the reallocation of existing road space:

There was an increased focus on walking and cycling, but we really struggled to invest at the rates that the Government and we would like to, and the reasons for that are kind of complex …the reasons ...often come back to community support, social licence (Government official)

This interviewee also noted that the national and regional mode shift planning triggered by GPS 2018 had also revealed the considerable current underfunding of cycling and walking relative to the pace and scale of transformative change that would be needed to meet mode shift targets.

Stakeholder support was raised by another group of interviewees with respect to their road user constituents. They noted that the high level, strategic nature of the GPS made it difficult to identify and report progress and outcomes that were tangible and meaningful for their constituent members. Yet grassroots stakeholders needed to see how their interests and contributions to change were reflected within and through the GPS system, should their support to the GPS be expected.

5.7 External change factors

Several interviewees observed that factors external to the land transport investment system could act as either enablers or constraints to desired GPS momentum and outcomes. Factors identified included the impact of rising fuel prices (eg, typically a positive safety impact due to reduced VKT), COVID (eg, loss of momentum in the uptake of public transport), and recent examples of major transport investments via direct Crown funding, outside the GPS and NLTP (eg, NZUP, Urban Cycleway Programme). Recent Crown investments were considered a clear indicator that, increasingly, the NLTF alone was insufficient to address critical transport investment needs:

…but often it's been Crown funding that's made the difference through …with the urban cycleways and then more recently the Crown stimulus COVID Response and Recovery Fund (Government official)

One sector interviewee noted that whilst the additional funding sources are encouraging, they also create complexity and make accessing and administering these difficult and time confusing resulting in a slower delivery of infrastructure projects.

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[37] Blewden, M., Mackie, H., & MacArthur-Beadle, S. (2022a). Urban Cycleway Programme 2014-21: Lessons learnt and future direction [Report prepared by Mackie Research and Consulting for Waka Kotahi].

5.8 Perceptions and experiences of the investment system

It was beyond the scope of the interview participants in this study to comment on the policy direction signalled by GPS 2018. Nonetheless, in discussing the impact of GPS 2018, participants inevitably commented on policy direction and the investment system overall. These reports are provided and discussed below as they give insight into the experience of stakeholders and may help to inform future action. For example, reports illustrate a range of understanding about the system, clearly reinforcing the importance of open and clear communications about how the system operates.

We also note that respondents in this evaluation reflected a range of different perspectives from within central and regional government and between different interests in the transport sectors, each with often diverging priorities with transport funding. This evaluation was able to acknowledge these perspectives and include them for consideration, but we did not seek to resolve nor validate them.

One sector stakeholder described the GPS and NLTF as a “predict and provide” model, which they believed tended to support the status quo or business as usual responses. In a similar vein, a government official described the investment model as a “bottom up, bid by bid” approach. In their experience, this tended to incentivize the investment in “things” and presented challenges in achieving a more “whole of system” response that more fully leverages the range of inputs and change levels needed to achieve the intended. For example, while urban development was not a primary lever available within the system, it was highly influential in shaping land transport outcomes. Similarly, the focus on investing in infrastructure and services made it difficult to define and generate investment momentum in demand management strategies.

Interviewees made a range of observations about the process of finite investment resources being allocated to discrete activity classes, this reflects that any GPS is ultimately a decision about where investments are prioritised, and this will often be contested. The prioritisation and allocation process is clearly a factor that can shape stakeholders’ perceptions of and support for investment decisions made.

Several stakeholders reflected on the investment decision making process, for example questioning the quality of the analysis and the weighting of evidence used to inform decisions. They raised questions about how BCR analysis was or was not being used in decision making. Such comments may be reflective of how the changes to the IDMF are impacting decision making and how different stakeholders are experiencing these shifts. They again reinforce the importance of regularly communicating the basis of decisions made and the range of factors considered.

> *…saying this investment in Kiwi Rail is an investment in road safety, it’s a highly indirect …[a] small benefit compared to what you could get for that same amount of money put into direct road safety investment* (Sector stakeholder)

> *…some big road projects barely had [positive BCR] …yet cycling and walking projects can have high BCR but [don’t’] get political buy in or [don’t] get funded …[the] measure should be used consistently* (Sector stakeholder)

Some comments illustrated different views and understanding about policy direction and current strategy. The importance of maintaining an open system, which gives access to the evidence and strategic basis driving investment decisions, is again indicated.

> *...if the goal is to make our road safer and people on our roads safer, and we're looking at a dollar spend basis, are we better to be focusing on particularly expensive cycling developments or do NZTA and the agencies guided by GPS need to be …just making some hard decisions about spending that money on road maintenance and really achieving some improvements to the state highway network* (Sector stakeholder)

> *…[need to be a greater focus on] …road and design conditions, engineering, maintenance, driver awareness of fatigue, impact of mental health, anxiety, training, and skills …[there is] no consideration to drivers building their own awareness and taking responsibility [under Road to Zero]* (Sector stakeholder)

Other comments may be read as supportive of the broader view of transport investment priorities signalled by GPS 2018 while also advocating for further expansion. For example, one interviewee supported the safety focus but felt a more explicit focus on the safety of all road users would support a wider suite of safety investments. For example, in addition to "driver" focused initiatives such as median barriers and roundabouts, other valid safety investments would include enhancing personal safety in public transport, reducing traffic volumes, and reducing VKT. In another example, which broadly supported the access priority, an interviewee advocated for a more explicit focus on accessibility and the prioritisation of investments that enhanced access and reduced the need for mobility (eg, enhancing online services, car share, neighbourhood workspaces).

Several sector interviewees sought a greater level of accountability for multiple GPS priority outcomes within the investment system. One felt that while the direction of GPS was clearly signalled, system responses tended to be filtered through business as usual mindsets, practice bias, and existing momentum. As illustrated in the quote below, they believed this could lead to investment decisions at odds with GPS intent. They signal a need for balancing a range of outcomes in decision making regarding GPS priorities and broader government policy directions, such as emissions reductions.

> *A big highway could be objectively safer than the parallel route, but the second order effects are that it incentivises more driving which has knock on effects elsewhere in the network* (Sector stakeholder)

Further comments from this same interviewee illustrate how different stakeholders may view and understand investment decisions differently. Referring to a cycling and walking project which also required significant investment in seawall infrastructure, this stakeholder saw the seawall investment as diverting cycling and walking funding away from direct cycling and walking outcomes. However, from an investment planning perspective, the investment was likely to have been assessed as meeting multiple outcomes under safety, mode shift, access, and resilience, respectively.

> *…half the budget [of cycling and walking infrastructure] …swallowed by removing demolition materials …a huge chunk of the budget [to] pay for a seawall* (Sector stakeholder)

Another sector stakeholder believed that the investment system was more aspirational than mandatory, in their view, lacking the ability to force meaningful change:

> *[It was] explicitly stated that there was going to be a significant increase in the level of ambition for delivering Land Transport free of death and serious injury …we just can't say that's been met* (Sector stakeholder)

> *…just need to get into action …go back [in time] …the words might look different, but there's no change …road safety, modal share, use of public transport, it has been around since the mid 90s …if you stood back and said what the real substantive changes or shifts are…apart from environment, there aren't any* (Sector stakeholder)

5.9 Future GPS system stability

Reflecting on the disruptive nature of GPS 2018, several interviewees believed there might be greater stability in the investment direction signalled by future GPS. A range of factors was suggested as likely to contribute to this.

- A foundation laid by GPS 2018 that supports future GPS priority setting and building on the momentum established in 2018. Each GPS sets a ten year strategy, and while refreshed every three years, a broadly consistent framework will support system stability and direction.
- The Transport Outcomes Framework[38] and definition of the core long term outcomes sought by the transport sector, the GPS is then able to signal the funding levers for achieving the longer term outcomes.
- Future focused, 30 year strategic planning recently begun by Waka Kotahi.[39]
- The new IDMF and a broader range of criteria used to inform investment decisions.
- Longer term policy stability and alignment required on land transport investment responses to climate change and emissions reductions, which is expected to deliver further alignment of GPS with broader policy settings.
- Increasing fiscal constraint, and within this, greater clarity of fiscal priorities.

5.10 Case study: Te Huia train service

5.10.1 Alignment with GPS 2018

Te Huia is a commuter train service connecting Hamilton with Auckland on weekdays and Saturdays. The service had been advocated for some time and was supported by alignment with GPS 2018.

The project was led by Waikato Regional Council, which was an approved organisation for receiving NLTP funded via Waka Kotahi and delivered by KiwiRail. Te Huia train service business case was approved by Waka Kotahi in December 2018, six months following the publication of GPS 2018.

Te Huia is significant for offering a transitional rail model, signalled in GPS 2018, which could potentially herald a new interregional rail approach. A "transitional rail activity class" was signalled in GPS 2018 to enable some beneficial passenger rail projects to progress, including interregional commuter rail services. The unambiguous support given by GPS 2018 in this space was a key factor in the business case approval.

Other key factors that supported the business case approval were its strategic fit, alignment with transport access and choice, and access to social and economic opportunities,

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38 https://www.transport.govt.nz/area-of-interest/strategy-and-direction/transport-outcomes-framework/

39 https://www.nzta.govt.nz/planning-and-investment/planning/30-year-plan/

particularly through fostering interregional rail. Environmental benefits could also be identified through reduced vehicle emissions.

The project offered a service innovation with delivery in a rapid timeframe, with a launch in early 2021. This could bring the delivery of the service forward by many years, compared to the construction of a high speed rail link between Auckland and Hamilton.

The five year cost of Te Huia, at $97 million, was far lower than the estimated $16 billion required to establish a high speed rail link. These positives, however, were undermined by the age of the stock (extended to last another five years), the relatively low frequency of the service, and the travel time of the journey, at 2.5 hours, undermining its value as a commuter service. These contributed to a relatively low BCR.

5.10.2 Implementation

The service was launched in April 2021, stood up in a remarkably short 13 months, and was implemented as a five year trial service (coinciding with the life of the carriages) with a review period planned after two years by Waka Kotahi. The rolling stock consists of substantially refurbished carriages, which were nevertheless still some 50 years old at the time the service was launched.

Te Huia was implemented very rapidly. However, doing so posed a range of constraints that limited its implementation, including integrated ticketing, limitations on disability access, options for station interchanges, and integration with Auckland Metro services.

From customer feedback surveys, Te Huia appears to offer strong reliability, customer service and price but performs less well on frequency and speed of the connection.[40] The service was initially intended as a connection service from Hamilton to Auckland but scheduling also allows for Auckland to Hamilton returns with an overnight stay. Despite its commuter target, the service has uncovered a latent demand for weekend travel and travel by *SuperGold* Card users, and the current price point is proving attractive for many.

5.10.3 Looking to the future

Te Huia was purposefully funded as a trial service. It is critical to explore the learning from the service and the lessons it offers for future interregional rail policy and planning over longer term horizons. In part, a key value of Te Huia is exploring what the service heralds for the future and what a suitable interregional service could and should look like.

The implementation of Te Huia to date reveals that there are potentially other customer groups, with other outcomes possible from such a service. The five year time horizon of the trial provides the opportunity to test who are the customer groups, their value drivers (such as frequency, reliability, level of amenity, value for money and speed) and what they are seeking from an interregional rail proposition, and the different solutions that could be offered.

Notably, procuring new rolling stock is a five year process. The two year review will, therefore, likely pose questions of if and how to extend the current stock and what could or should replace the existing stock. It is also worth noting that the safety standards of the

[40] Waikato Regional Council. 2022. Te Huia Customer Satisfaction Survey 2022. Report to Waikato Regional Council Te Huia Train Service Subcommittee.

existing stock are very different to modern carriages, and the extent to which these should be continued further is an open question.

The two year review will help uncover these and other lessons from the first two years and benefits realisation in such areas as emissions saved, patronage, accessibility and other indicators.

Te Huia has further highlighted that there is a gap in interregional rail policy and the challenges of multiple councils working together on this issue. Each council has their own boundaries, structures and constituents that do not always align with a national or interregional model.

Finally, Te Huia reveals a tension between the tactical three year time horizon of the GPS and the longer term planning needs. It is challenging to deliver infrastructure projects in a short timeframe with the degree of planning required. Simple considerations of stock procurement extend well beyond the remit of any one GPS. There is also a need for longer term outcomes planning and specification, within which strategic decisions on such areas as interregional rail can be made and implemented.

6 Overall conclusions and reflections for the future

6.1 Key findings

This evaluation finds that attributing influence to any one GPS is complex and challenging, particularly as direction setting, objectives, and outcomes are tempered by the legacy of previous GPS and the interplay of national and regional priorities. Beyond influencing investment decisions, we conclude that GPS influence and outcomes are ongoing and less able to be directly attributed in the short term.

This evaluation has highlighted, however, that there is value in exploring the opportunities, challenges, and successes of each GPS, as a long term intervention rather than as a short term initiative and how the transport system and the outcomes it produces are steadily unfolding. This suggests more of a system level monitoring and evaluation approach in the future that tracks and determines the contributory role of each GPS to outcomes.

Returning to the original objectives of the evaluation, we find that in broad terms:

- Budget allocations to activity classes are a key change mechanism.
- To some extent, GPS 2018 investments are showing movement towards their intended results, particularly in the changes in the mix of investments towards safety, access, mode shift, public transport and active modes. Investment shifts are now flowing through to delivery, but broader outcomes of GPS 2018 are yet to be determined.
- The signals within GPS 2018 were picked up in investment decision making by Waka Kotahi and broadly matched the GPS direction across all activity classes except rapid transit, but the timing of the GPS limited its influence/alignment in RLTPs outside of Auckland.
- GPS 2018 was a catalyst for a broader understanding of land transport and the land transport investments needed to address transport priorities. The process that unfolds, particularly at a regional level, maybe more of alignment than direct influence.
- The disruptive nature of GPS 2018 required shifts in demand and supply side system capability and capacity that are still in progress as new skills and mindsets are required to give effect to GPS priorities. The continuity of direction in GPS 2021 will continue to build system momentum and should enhance visibility of the contribution of the GPS towards intended outcomes.
- Within each GPS, relatively small proportions of funds are available for discretionary investment. Increasing costs of maintaining the growing system could place constraints in the future on funding for new initiatives.

6.2 Strengths and limitations

This evaluation was able to comprehensively review investment decision making and test for their alignment with GPS 2018. In doing so, we were able to explore the significant array of data in a unique way. The quantitative data analysis was complemented by qualitative insights that gave context and a deeper understanding of the opportunities and challenges of GPS influence and contribution.

The scope and availability of data for this evaluation meant that the quantitative analysis was only able to focus on how funding was spent, not on the efficiency and effectiveness of

spending. Exploring efficiency and effectiveness will require a more granular analysis of key aspects of implementation and drawing on benefits realisation analysis and ex-post investment reviews, which are not yet well embedded in the transport system.

Stakeholders identified broad impacts from GPS 2018 when reflecting on the complexities and timeframes of the investment process. However, they were often unable to provide more detailed or specific analyses.

As noted earlier, there was a broad heterogeneity of respondents, reflecting different perspectives of central and regional government and sectors with often diverging priorities with transport funding. This evaluation could bring these different perspectives to bear but did not seek to resolve nor validate them.

6.3 Reflections for Value for Money Framework

In 2019 a new VfM assessment model was developed by Te Manatū Waka, which is in the process of being introduced to the sector.[41] The model is intended to support greater emphasis on transparent investment decision making, consistency in assessment approaches, and enhanced reporting on the outcomes achieved by investments.

The model acknowledges that cost benefit analysis isn't always feasible and that wider considerations beyond the benefit cost ratio (BCR) should inform transport investment appraisals. It indicates that decision makers should consider the full range of benefits and costs over the whole life of investments and be cognisant of possible future changes and uncertainty so that investments are made in options that perform across a wide range of possible scenarios.

As summarised in Figure 17, when appraising potential VfM of proposed transport investments, the model prompts analysts and decision makers to consider whether:

- strategic government policy has been translated into identified investment impacts/outcomes
- business requirements (technical, operational, and functional) are systematically applied to translate outcomes into output solutions
- value indicators (including BCRs and non monetised benefits, based on Waka Kotahi guidelines) indicate the investment is a good use of funds
- the benefits gap factor (a check against optimism bias, informed by an agency's past performance in successfully delivering benefits) suggests outcomes are achievable, and
- there is sufficient capacity and capability to deliver, given the complexity of the investment.

Different implementation tools apply for each of the five above elements. The GPS is particularly well suited towards identifying the outcomes sought from transport investment, but the VfM model also flows through into a range of other areas of activity, including RLTPs (outcomes), procurement (business requirements), IDMF (business requirements), monetised and non monetised benefits (value indicators) and benefits realisation reviews (benefits realisation).

[41] Ministry of Transport. 2019. Value for Money Framework Review: Implementation Plan. Wellington: Ministry of Transport.

Figure 17 Te Manatū Waka Value for Money assessment model

The model is in the process of application to the sector and was not implemented for GPS 2018 implementation. At the time of data collection, it was too soon for the model to be explored comprehensively for the purposes of this evaluation. Interviewees, in response to questions on value for money, did not explicitly reference the Value for Money Framework. This might be expected, given the framework is in the early stages of use and implementation.

Some interviews indicated that, in line with our investment analysis, a BCR of at least one continued to be the primary criterion for GPS 2018. However, consideration was also given to strategic fit criteria. The interviews also indicated that the approach and methods to be used for benefits realisation is still a work in progress and that there has been limited implementation to date. This is likely to be an ongoing challenge for the alignment of future GPS implementation with the VfM model. Analysis of realised benefits is necessary to complete the feedback loop shown in Figure 17.

6.4 Potential directions forward for future GPS

A key finding from this evaluation is the tension between using the GPS as a tool for transformative change and, at the same time, having sufficient consistency between successive GPS to build delivery momentum. The longstanding priorities established in earlier GPS sustained initiatives such as the RoNS programme over an extended period. Similarly, if the shifts envisaged by GPS 2018 are to be maintained, then future GPS need to reflect and build on these directions as GPS 2021 has already done. It is also acknowledged that change brings with it initial impacts on service efficiency as they adapt to new priorities.

A further challenge for GPS in the future will be aligning transport investment with broader policy settings. For example, the need for significant and sustained emissions reductions, which in our cities may mean fewer people driving, driving less often, and taking up other transport options.

Alignment with broader government policy settings will also support consistency in GPS and subsequent transport investment and planning. However, it is acknowledged that the GPS reflects the priorities of the government of the day and that change will likely occur.

Investment priorities are clearly an important driver of decision making and implementation. However, an investment model alone will be limited in achieving the transformations needed. It seems apparent that future GPS will increasingly look to enhance the integration between the investment levers available through the GPS and other change levels such as regulation, targets, pricing, land reform, and spatial planning.

Stakeholder discussions explored the impact that the GPS has had in investment planning and implementation, and where these could be identified, some discussion is included. However, these were less evident in the short time period since GPS 2018 was published. For the future, it would be useful to explore the range of projects that eventuated from GPS investments and any monitoring of benefits realisation that was undertaken to provide a clearer picture of GPS impact and transport system outcomes.

Discussions also highlighted the centrality of the continuous programme in transport investment. This included the need for ongoing and additional resources to meet escalating cost increases and the opportunity to strengthen the linkage between policy objectives and "baseline" expenditure such as routine maintenance. As fiscal resources become more constrained, we can expect to see greater attention being given to innovative uses of core expenditure.

6.5 Reflections on transport investment data analysis

The NLTP extracts and funding decisions data used for this analysis are a rich source of information about transport investment decisions, as illustrated by the results presented above. It would be possible to use this data to develop regular reporting of new funding decisions and significant changes to existing funding to give better visibility of how funding is tracked versus GPS policy priorities. This could enable an ongoing evaluation of funding allocation as a complement to or substitute for standalone evaluations of individual GPS such as the present evaluation.

An ongoing evaluation at an annual or quarterly frequency can reflect realistic characteristics of the transport investment process, such as:

- the "moving target" nature of GPS policy priorities
- time lags that occur between policy changes and funding decisions due to the need to design and develop investments that are a good fit for policy objectives, and
- inertia created by past funding decisions for investments that can take many years to progress to completion.

The transport investment data focused on the approved decisions (because of their link to delivering desired outcomes) and not those not approved, which were out of scope. There may well be value in future studies exploring to look at the characteristics of those proposed but declined investments against those that were funded to check for consistency and rigour in the investment process and to assess if the most beneficial investments and those most likely to achieve GPS outcomes were selected.

Further analysis and reporting of transport investment data could also be facilitated by some improvements to the data itself. These changes involve improving the consistency and clarity of the investment data rather than collecting substantial amounts of additional data. Based

on our experience of working with the NLTP snapshot and funding approvals data from TIO, the following improvements could be useful:

- Create documentation for the fields in the data, including what is measured, where the data is obtained from, how frequently it is updated, any revisions to the data or definition over time, and any data quality limitations.
- Apply minimum standards for the quality of all data recorded in the NLTP extracts to improve the consistency of information.
- Develop a consistent way of categorising the type and objectives of projects that are independent of GPS policy priorities and create guidelines for applying these categories in practice.
- This could involve creating a relatively large set of narrow categories that can be aggregated as needed.
- The introduction of new categories that overlap with existing categories should be avoided.
- A separate set of reporting categories could be developed that are linked to the base categories if needed, eg, to report investments related to policy priorities like “road to zero” that can span multiple types of activity.
- If feasible, historic activities could be coded to a consistent set of categories to facilitate analysis of trends over time.
- Publish a combined set of funding approvals data reflecting the aggregation of the existing monthly extracts.
- Publish detailed NLTP and funding approvals data, including information about individual investment activities, as publicly accessible datasets outside TIO to facilitate greater use and analysis of this data. Given the evolving nature of this data over time, this would ideally be as a set of monthly or quarterly snapshots with historic snapshots retained rather than only the latest data. Providing a set of consistent snapshots would enable an analysis of changes in funding decisions over time.
- Clearly distinguish budgeted expenditure from actual expenditure in the NLTP extracts. Our understanding is that the current extracts include budgeted expenditure for future years and actual expenditure for past years. Ideally, the past budgeted expenditure would be retained and reported separately from the actual expenditure for each investment phase so that actual and budgeted expenditure can be easily compared.
    - Review and clean the BCR data to remove indicators of missing values (eg, 0 or 99) and clearly distinguish where a default BCR value has been used or if the BCR value is an initial or final estimate.

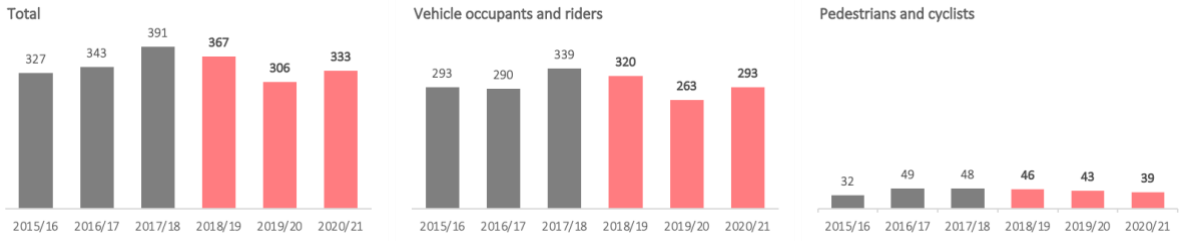
Appendix 1 Trends observed in GPS 2018 outcomes monitoring

The data in this appendix detail trends over time in a selection of key GPS related outcomes, by way of context and for information purposes.

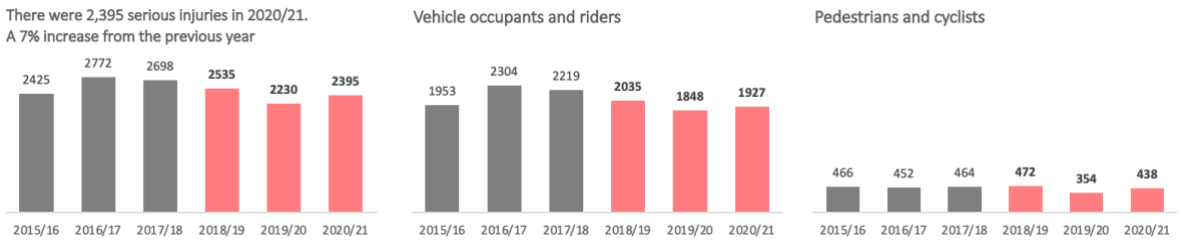
Overall, these figures indicate:

- A general decline in deaths and serious injuries since 2018/19 compared to the previous three years, but with some variations, noting that transport activity levels in 2019/20 and 2020/21 were impacted by COVID lockdowns.
- Faster growth in the network of walking and cycling facilities since 2018/19 compared to the previous three years, some of which may be a legacy of earlier funding decisions
- A general reduction since 2018/19 in the percentage of the population with access to frequent public transport services in Auckland, but growth in Christchurch and general stability in Wellington
- Overall growth in cycling counts year on year since 2015/16
- Continuation of a gradual decline in the proportion of children who travel to and from school using active modes since 2015/16
- Ongoing increases in road maintenance costs since 2015/16
- Increasing distance per capita travelled in single occupancy vehicles since 2015/16 in main urban areas but reducing in Christchurch
- Increasing land related greenhouse gas emissions since 2016, overall and per capita.

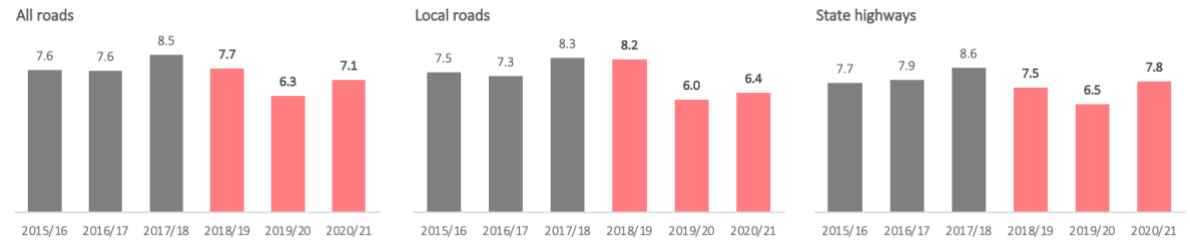
Annual road deaths



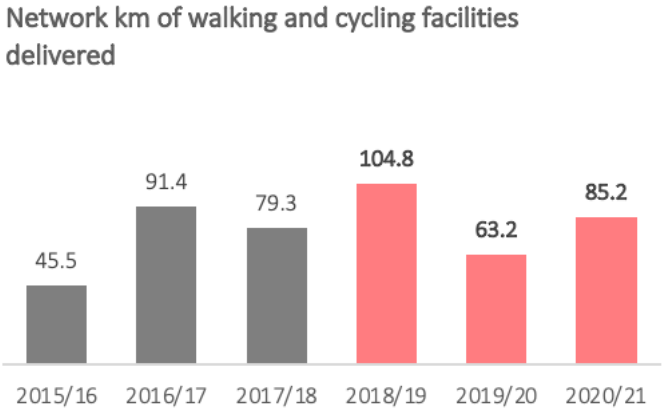
Annual road serious injuries



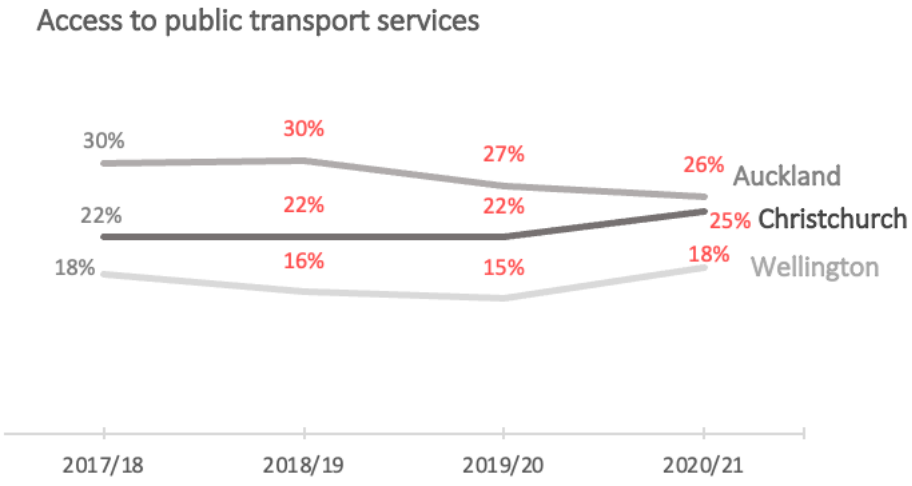
Annual road deaths per billion vehicle kilometres travelled



Network kilometres of walking and cycling facilities delivered

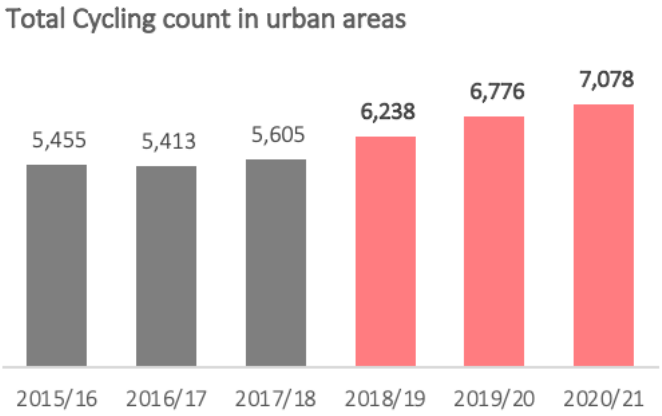


Percent of population with access to frequent public transport services

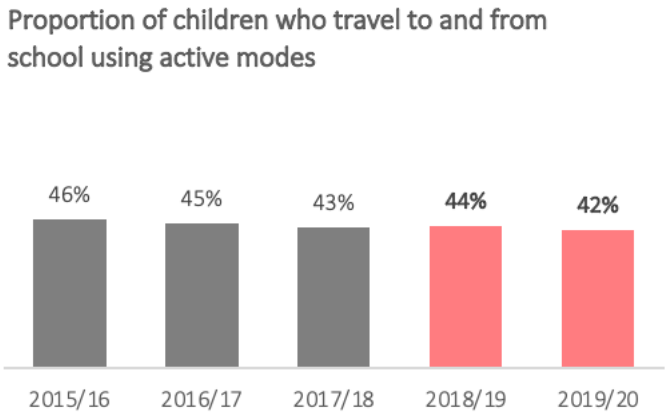


APPENDIX 1 TRENDS OBSERVED IN GPS 2018 OUTCOMES MONITORING

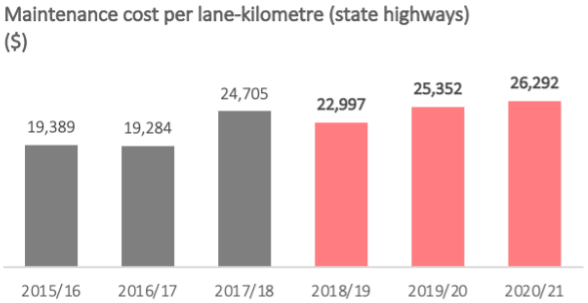
Cycling count

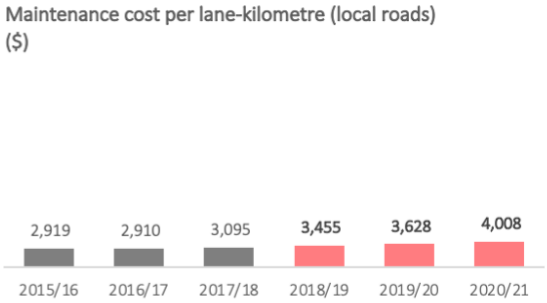


Proportion of children who travel to and from school using active modes

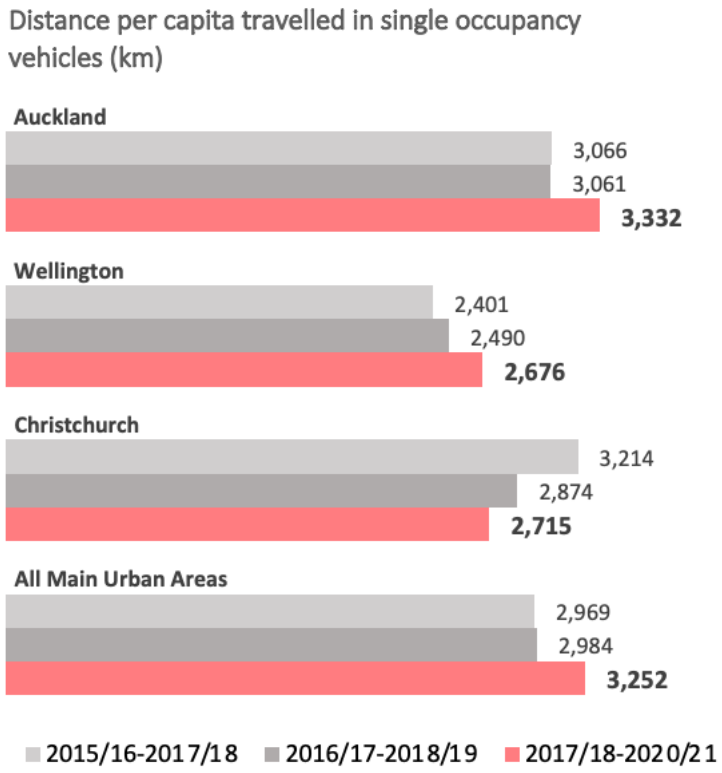


Road maintenance costs

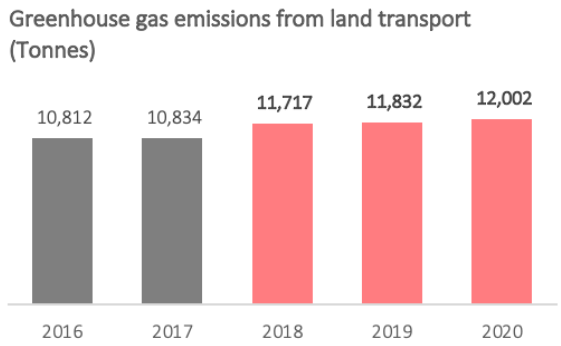


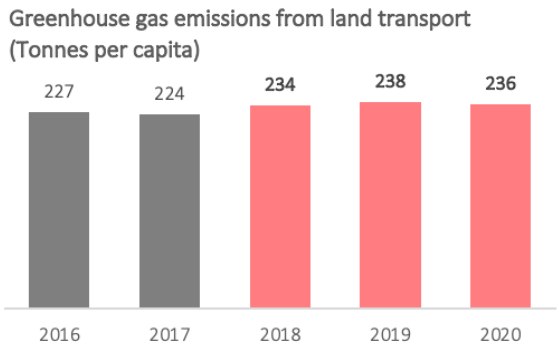


Distance per capita travelled in single occupancy vehicles



Greenhouse gas emissions from land transport





APPENDIX 2 CRITERIA SELECTION

Appendix 2 Criteria selection

This evaluation uses a defined set of criteria (aspects of performance) to provide an explicit basis for making robust and transparent judgements from the evidence. The criteria are aligned with the GPS 2018 short term results and final reporting measures established by Te Manatū Waka for GPS 2018.[42] However, they differ from the GPS 2018 short term results in three important ways: 1) criteria are distinct from indicators in that they describe relevant impacts without specifying how they should be measured, 2) the criteria used in this evaluation relate to expected impacts of GPS 2018 at the point in time that the evaluation was conducted, 3) the criteria focus on a subset of GPS 2018 impacts that were feasible to evaluate from available data.

Also note that for most indicators used in this evaluation, targets had not been set to specify the expected extent of changes in investment decisions over 2018-21. For future GPS, targets would assist with monitoring and evaluating change over time.

Table 3 is provided for transparency to show the relationship between the GPS 2018 short term results, the evaluation criteria, the quantitative and qualitative evidence used to address each criterion, and to highlight data gaps that limited the evaluation's focus on impacts.

The first column of Table 3 shows the GPS 2018 short term results, organised under the key priority areas of safety, access, environment, and value for money. The second column translates these short term results into evaluation criteria: positive statements describing the expected impacts of GPS 2018 in 2022.

The third column sets out GPS 2018 indicators and the extent to which they were able to inform the evaluation. In detailed planning for the evaluation with Te Manatū Waka and Waka Kotahi, a wide range of data was reviewed for its potential to inform the evaluation. GPS 2018 established many quantitative reporting measures. However, only some of these measures were relevant to the evaluation criteria, were supported by available data, and were of sufficient quality to have confidence that sound conclusions could be reached. The proposed sources of quantitative evidence also take into consideration the smaller set of reporting measures established for GPS 2021.[43] Following feedback from Te Manatū Waka and Waka Kotahi, we refined the indicator set to those that are measurable, reportable and relevant to this evaluation, noting where indicators may be useful for future monitoring but are not currently available.

Sources of quantitative evidence were differentiated into direct measures and supporting measures for the reasons explained above. Measures in *italics* required analysis of transport investment data to be provided by Waka Kotahi. These are detailed in Table 3 on the pages that follow.

- Measures highlighted yellow cannot be reported due to a lack of data.
- Measures that are underlined can only be reported for some or all years between 2018/19 to 2020/21 but not for other periods, so there is no baseline to compare outcomes under GPS 2018 against.
- Measures with a dashed underline are reported for aggregated periods that do not exactly align with GPS periods.

The fourth column summarises lines of enquiry that were explored through qualitative interviews.

The final column indicates our level of confidence in the evidence to enable a well informed conclusion to be reached. Our analysis focuses on criteria where there is an **adequate** level of

[42] https://www.transport.govt.nz/assets/Uploads/Report/Final-GPS-2018-measures.pdf

[43] https://www.transport.govt.nz/assets/Uploads/Paper/GPS2021.pdf

confidence in the evidence and excludes criteria where the evidence is inadequate to support a judgement or where there is no evidence available. (A 4th rating level, "high confidence," was initially defined but was found not to apply to any of the evidence).

- **Adequate**: Our judgement is more likely than not to be accurate, given the available evidence.
- **Inadequate**: We cannot confidently reach a conclusion from the available evidence.
- **No evidence available**.

The upshot of this criteria selection process is that the evaluation focuses on the following GPS 2018 outcomes, drawing on quantitative analysis of committed forward expenditure and qualitative analysis:

- increased transport investment mix toward safety oriented investments
- increased investment in a better integrated transport network, including public transport, walking and cycling and improved land use planning that aims to support improved throughput and access in metropolitan areas
- increased focus of transport investment to promote active transport and public transport via improved infrastructure, better connections, and improved safety
- increased investment in and delivery of transport projects that seek to promote the uptake of active travel modes to support environmental and public health objectives
- increased rigour and transparency of transport investment appraisals.

Table 3 GPS 2018 evaluative criteria

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
Priority 1: Safety				
1 Renewed strategic focus to have the greatest impact on reducing death and serious injury	Renewed strategic focus to have the greatest impact on reducing death and serious injury	*Analysis of shifts in transport investment mix toward safety oriented investments* Measure 29C. Investment aligned to GPS priorities (assessed strategic case benefits) Measure 29D. Projected benefits for implementation activities at time of funding approval Measure 2A. Total road deaths and serious injuries	To what extent has the strategic focus shifted toward safety improvements?	Adequate, based on investment analysis and qualitative feedback
2 State highways and local roads are safer for everyone 3 Cycling and walking are safer	Increased investment in and delivery of projects that make state highways and local roads safer for everyone and that make cycling and walking safer	Measure 2C. % of state highway and local road networks modified to align with safe and appropriate speed Measure 2D. $ investment in state highway improvements, local road improvements Measure 3B. Network kilometres of walking and cycling facilities delivered Measure 3C. $ investment in walking and cycling *$ investment in state highway, local road, walking and cycling improvements by degree of alignment with GPS safety priorities* Measure 2A & 2B. Road deaths and serious injuries and road crash hospitalisations by road type and mode Measure 3A. Pedestrian and cyclist injuries	To what extent do you see increased investment in making state highways and local roads safer? To what extent do you see increased investment in making cycling and walking safer? What's changing/shifting in these investment categories? Are they meeting the intentions of the GPS?	Adequate, based on investment analysis and qualitative feedback Unable to attribute to outcomes at this point

[44] The level of confidence in the evidence is not "how confident are we that the GPS had a positive impact?" but rather "how confident are we that the evidence is good enough to let us judge?"

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
4 Effective enforcement activity to promote safe behaviour by road users 5 Safer road use through appropriate education and promotion activities and regulatory changes	Increased focus on *effective* enforcement activity and *appropriate* education and promotion activities to promote safe behaviour and road use by road users	Measure 4E. Dedicated road policing staff Measure 4F. $ investment in road policing Measure 5A. % of road safety advertising campaigns that meet or exceed their agreed success criteria Measure 5B. % of road safety education programmes meeting targets for access to road safety information Measure 5E. $ investment in promotion of road safety and demand management	To what extent do you see shifts in types of enforcement activity toward effective enforcement and appropriate education and promotion activities that encourage safe behaviour by road users? What's changing/shifting in terms of enforcement activity, education and promotion? Overall, what has enabled or challenged these shifts in Safety outcomes towards what was intended by GPS 2018?	Inadequate to assess "effective" or "appropriate" based on data available
Priorities 2-4: Access				
6 A more accessible and better integrated transport network including public transport walking and cycling 7 Improved land use and transport planning to create more liveable cities 8 Improved throughput of people and goods in metropolitan areas 9 Improved transport access to new and existing housing, including provision of public transport services	Increased investment in a better integrated transport network, including public transport, walking and cycling and improved land use planning that aims to support improved throughput and access in metropolitan areas	Measure 6H. $ investment in: public transport, rapid transit, transitional rail Measure 3C. $ investment in walking and cycling Measure 6A. % of population with access to frequent public transport services Measure 6D. Access to jobs Measure 6E. Access to essential services Measure 6G. % of people unable to make a beneficial land transport journey Measure 7A. % of recently built residential dwellings with access to public transport services and active mode Measure 7C. % of urban networks with speed limit of 40 km/h or below	To what extent are you seeing increased investment in a better integrated transport network, including public transport, walking and cycling? What's changing/shifting in this investment category, and why? To what extent are you seeing improved land use and planning to support transport accessibility? What's changing/shifting in terms of transport and land use planning?	Adequate, based on investment analysis and qualitative feedback

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
		Measure 9A. $ investment in providing public transport for new housing in metropolitan and high growth urban areas Measure 6B. Mode share – people Measure 6C. Mode share – freight Measure 6F. Number of passenger boardings using urban public transport services Measure 8A. Utilisation of key movement corridors for people and freight		
10 Nationally important transport connections are maintained or improved to support areas of growth, changes in population, freight and tourism, and to promote safety	Adequate and appropriate investment in and maintenance of nationally important transport connections to support areas of growth, changes in population, freight and tourism and to promote safety	Measure 10B. % of key national and regional networks that meet One Network Road Classification (ONRC) customer levels of service for Safety, Resilience/access, Travel time reliability		No data available
11 Enhanced testing and deployment of intelligent transport systems and other technologies to make the best use of existing networks	Transport investment and delivery include testing and deployment of intelligent transport systems and other technologies to make the best use of existing networks	Measure 11A: Number of technology trials undertaken and implemented Measure 11B: $ investment in intelligent systems and other technologies, and level of research and evaluations in these	To what extent are you seeing testing and deployment of intelligent transport systems and other new technologies as part of transport investments?	Adequate to assess shifts in planning and sector research investment
12 Regional networks (including key regional freight routes) are safer, better connected and more resilient	Adequate and appropriate transport investment designed to improve and maintain the safety,	Measure 12A. Lane kilometres of improved regional roading Measure 12B. % of routes of most economic and social importance that have viable alternative routes		Adequate, based on investment analysis and qualitative feedback on planning and priorities

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
13 Improved transport connections (including local roads, public transport and active modes) on key regional tourist routes to make these routes safer for all	connectedness, and resilience of regional transport networks	Measure 2C. % of state highway and local road networks modified to align with safe and appropriate speed Measure 13A. % of national cycling tourist routes completed Measure 13C. % of Te Araroa at a roadside without a path Measure 13E. $ investment in tourist routes for walking and cycling Measure 13B. Use of cycling tourist routes		
14 A reduction in overall single occupant private vehicle travel in urban areas 15 Improved good quality, fit for purpose walking and cycling infrastructure 16 Improved real and perceived safety for both pedestrians and cyclists 17 Increased proportion of journeys made using public transport and active modes of travel (including children travelling to and from school) 18 Expanded and better connected walking and cycling networks both in urban and rural areas	Increased focus of transport investment in ways that aim to promote active transport and public transport via improved infrastructure, better connections, and improved safety	Measure 3B. Network kilometres of walking and cycling facilities delivered Measure 3C. $ investment in walking and cycling Measure 16A. Perceived safety of walking and cycling *Mix of objectives of walking and cycling investments planned and delivered* Measure 14A. Distance per capita travelled in single occupancy vehicles Measure 15A. Cycling count in urban areas Measure 15B. Walking count in urban areas Measure 17A. Mode share for how children travel to/from school Measure 2A & 2B. Road deaths and serious injuries and road crash hospitalisations by road type and mode Measure 3A. Pedestrian and cyclist injuries Measure 6B. Mode share – people Measure 6F. Number of passenger boardings using urban public transport services		Substantial outcomes data available, but unable to make attribution to outcomes from GPS,

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
19 Public transport is more accessible and affordable, especially for those reliant on it to reach social and economic opportunities (including people with disabilities, low income people, and *SuperGold* card holders) 20 Specialised services provide better access to transport for people (including people with disabilities) unable to drive themselves or use scheduled public transport	Increased focus of transport investment on accessibility and affordability of transport services, including for vulnerable and disabled people	Measure 6E. Access to essential services Measure 6G. % of people unable to make a beneficial land transport journey Measure 19A. % of household spending on transport Measure 19B. *SuperGold* boardings	To what extent have accessibility and affordability of public transport and other specialised services been a factor in transport decision making? Are the needs of vulnerable and disabled people reflected in transport investment decisions? Overall, what has enabled or challenged these shifts in Access outcomes towards what was intended by GPS 2018?	Adequate, based on investment analysis and qualitative feedback on planning and priorities, limited data for vulnerable populations
21 Improved resilience on routes where disruptions pose the highest economic and social costs 22 Improved targeting of resilience risk and vulnerabilities through the use of an integrated whole of system approach, which may include investment in non transport infrastructure when this has clear transport benefits 23 When disruption to the network occurs, impacts of disruption are reduced at the parts of the network	Increased investment in and delivery of transport projects that improve resilience and optimise the response to any disruptions	Measure 21A. Kilometres of road and rail infrastructure susceptible to coastal inundation with sea level rise Measure 12B. % of routes of most economic and social importance that have viable alternative routes	To what extent is resilience a consideration in transport investment decision making? How is resilience considered, and is this sufficient?	Inadequate for this evaluation

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
that have the most economic and social importance				
Priority 5: Environment				
24 Reduced greenhouse gas emissions from land transport using a whole of system approach	Increased focus in transport investment decision making on reducing greenhouse gas emissions using a whole of system approach	Measure 24B. $ investment in greenhouse gas emission reduction measures *Proportion of transport projects invested in and delivered that include greenhouse gas reduction as an objective* Measure 24A. Tonnes of greenhouse gases emitted per year from land transport	To what extent are greenhouse gas emissions a consideration in transport investment decision making? How are emissions considered?	No data available
25 Reduced significant harmful effects of land transport related noise 26 Reduced significant harmful effects of land related air pollution 27 Reduced significant negative effects on water quality and biodiversity from construction and ongoing use of transport infrastructure	Increased investment in and delivery of transport projects that seek to reduce harmful external effects on noise, air pollution, water quality and biodiversity	Measure 27B. $ investment in stormwater quality management, biodiversity management practices Measure 27A. Tonnes of selected contaminants discharged from the land transport network into sensitive water bodies	To what extent are noise, air pollution, water quality and biodiversity a consideration in transport investment decision making? How are these factors considered?	No data available
28 Increased uptake of active travel modes such as walking and cycling to support environmental and public health objectives	Increased investment in and delivery of transport projects that seek to promote uptake of active travel modes to support environmental and public health objectives	Measure 3B. Network kilometres of walking and cycling facilities delivered Measure 3C. $ investment in walking and cycling Measure 6B. Mode share – people	To what extent is uptake of active modes a consideration in transport investment decision making? How is active mode uptake considered? Overall, what has enabled or challenged these shifts in	Adequate, based on investment analysis and qualitative feedback on planning and priorities

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
			Environment outcomes towards what was intended by GPS 2018?	
Priority 6: Value for money				
29 A more rigorous and transparent investment appraisal system	Increased rigour and transparency of transport investment appraisals	Measure 29A. $ investment in investment management Measure 29B. Total cost of managing the funding allocation system as a % of the National Land Transport Programme expenditure Measure 29C. Investment aligned to GPS priorities (assessed strategic case benefits) Measure 29D. Projected benefits for implementation activities at time of funding approval Measure 29F. Reporting of the assessment used in investment decisions Measure 29G. $ investment in activities with a benefit cost ratio of less than one	Thinking of the outcomes we can see from GPS 2018 to date, and in the context of other challenges we have faced, how do you see GPS 2018 delivering value for money overall? What have been the key areas of value achieved, and where has it fallen short? What have been the key shifts that GPS 2018 has enabled overall? What have been the biggest challenges to GPS 2018 succeeding in its goals?	Adequate, based on investment analysis and qualitative feedback on planning and priorities
30 Enhanced reporting, monitoring and evaluation of GPS 2018 investment	Increased focus on reporting, monitoring and evaluation of GPS 2018 investment	*Proportion of GPS monitoring measures for which data is available* *Coverage of GPS monitoring measures vs GPS priorities*		Adequate, based on investment analysis and qualitative feedback on planning and priorities
31 Better integrated transport research across government	Better integrated transport research across government	Measure 31A. % alignment of funded research to the NZ Transport Research Strategy		No data available
32 More effective and efficient investment from innovation in systems,	Transport investment makes better use of innovation in systems,			No data available

GPS 2018 short term result(s)	Evaluation criteria (expected impact of GPS 2018 in 2022)	Quantitative evidence	Qualitative evidence	Level of confidence in the evidence, based on criterion[44]
standards, procurement and technology	standards, procurement and technology			
33 Improved returns from maintenance	Transport investment seeks improved returns from maintenance	Measure 33B. Maintenance cost per lane kilometre delivered for state highways and local roads Measure 33A. $ investment in: State highway maintenance, Local road maintenance		No data available

Appendix 3 Investment data analysis

Baseline activities

Table 4 shows how TIO template types were used to classify phases as baseline or non baseline activities based on advice from Waka Kotahi.

Table 4 Classification of phases as baseline activities based on TIO template types

	Template type	Template description
Baseline activities	BC_EMERGENCY	Emergency 2015-18
	BC_MAINT	Maintenance Operations and Renewals 2015-18
	BC_PT	Public Transport 2015-18
	BC_RSP	Road Safety Promotion 2015-18
	BC_RTC_COSTS	RLTP Management 2015-18
	CC_MAINT	Maintenance programme 2018-21
	CC_PT	Public Transport 2018-21
	CC_RLTP_MGMT	RLTP Management 2018-21
	CC_RSP	Road Safety Promotion 2018-21
	DC_MAINT	Maintenance, operations and renewals 2021-24
	DC_PT	Public transport existing services 2021-24
	DC_RLTP_MGMT	RLTP Management 2021-24
	DC_RSP	Road Safety Promotion 2021-24
	EMERGENCY	Emergency Works
	MAINT_NS	Maintenance 2009/12
	PREVENTIVE_NS	Preventive Maintenance
	PT_NS	Public Transport Programme 2009/12
	RLTP_NS	Regional Authority Administration 2009/12
	SL_EMERGENCY	Emergency works 2012/15
	SL_MAINT	Maintenance Operations and Renewals 2012/15
	SL_PREVENTIVE	Preventive maintenance 2012/15
	SL_PT	Public Transport 2012/15

	Template type	Template description
Baseline activities	BC_EMERGENCY	Emergency 2015-18
	BC_MAINT	Maintenance Operations and Renewals 2015-18
	BC_PT	Public Transport 2015-18
	BC_RSP	Road Safety Promotion 2015-18
	BC_RTC_COSTS	RLTP Management 2015-18
	CC_MAINT	Maintenance programme 2018-21
	CC_PT	Public Transport 2018-21
	CC_RLTP_MGMT	RLTP Management 2018-21
	CC_RSP	Road Safety Promotion 2018-21
	DC_MAINT	Maintenance, operations and renewals 2021-24
	DC_PT	Public transport existing services 2021-24
	DC_RLTP_MGMT	RLTP Management 2021-24
	DC_RSP	Road Safety Promotion 2021-24
	EMERGENCY	Emergency Works
	MAINT_NS	Maintenance 2009/12
	PREVENTIVE_NS	Preventive Maintenance
	PT_NS	Public Transport Programme 2009/12
	RLTP_NS	Regional Authority Administration 2009/12
	SL_EMERGENCY	Emergency works 2012/15
	SL_MAINT	Maintenance Operations and Renewals 2012/15
	SL_PREVENTIVE	Preventive maintenance 2012/15
	SL_PT	Public Transport 2012/15
Non **baseline activities**	BC_MINORIMP	Minor Improvements 2015-18
	CC_LCLR	Low cost / low risk improvements 2018-21
	CC_PROGBCASE	Programme Business Case 2018-21
	CC_RESILIENCE	Resilience Improvements 2018-21
	CC_STRATEGIC_CASE	Strategic Case 2018-21
	CFA	Community focused activities
	CFA_NS	Community Programmes 2009/12

APPENDIX 3 INVESTMENT DATA ANALYSIS

	Template type	Template description
Baseline activities	BC_EMERGENCY	Emergency 2015-18
	BC_MAINT	Maintenance Operations and Renewals 2015-18
	BC_PT	Public Transport 2015-18
	BC_RSP	Road Safety Promotion 2015-18
	BC_RTC_COSTS	RLTP Management 2015-18
	CC_MAINT	Maintenance programme 2018-21
	CC_PT	Public Transport 2018-21
	CC_RLTP_MGMT	RLTP Management 2018-21
	CC_RSP	Road Safety Promotion 2018-21
	DC_MAINT	Maintenance, operations and renewals 2021-24
	DC_PT	Public transport existing services 2021-24
	DC_RLTP_MGMT	RLTP Management 2021-24
	DC_RSP	Road Safety Promotion 2021-24
	EMERGENCY	Emergency Works
	MAINT_NS	Maintenance 2009/12
	PREVENTIVE_NS	Preventive Maintenance
	PT_NS	Public Transport Programme 2009/12
	RLTP_NS	Regional Authority Administration 2009/12
	SL_EMERGENCY	Emergency works 2012/15
	SL_MAINT	Maintenance Operations and Renewals 2012/15
	SL_PREVENTIVE	Preventive maintenance 2012/15
	SL_PT	Public Transport 2012/15
	COMPLEX	Complex Project
	COMPLEX_NS	Complex Project 2009/12
	DC_AMP	Activity Management Plan 2021-24
	DC_IMPROVEMENT	Improvement activity 2021-24
	DC_LCLR	Low cost / low risk improvements 2021-24
	DC_PROGBCASE	Programme Business Case 2021-24
	DC_TRANSMODEL	Transport Model 2021-24

	Template type	Template description
Baseline activities	BC_EMERGENCY	Emergency 2015-18
	BC_MAINT	Maintenance Operations and Renewals 2015-18
	BC_PT	Public Transport 2015-18
	BC_RSP	Road Safety Promotion 2015-18
	BC_RTC_COSTS	RLTP Management 2015-18
	CC_MAINT	Maintenance programme 2018-21
	CC_PT	Public Transport 2018-21
	CC_RLTP_MGMT	RLTP Management 2018-21
	CC_RSP	Road Safety Promotion 2018-21
	DC_MAINT	Maintenance, operations and renewals 2021-24
	DC_PT	Public transport existing services 2021-24
	DC_RLTP_MGMT	RLTP Management 2021-24
	DC_RSP	Road Safety Promotion 2021-24
	EMERGENCY	Emergency Works
	MAINT_NS	Maintenance 2009/12
	PREVENTIVE_NS	Preventive Maintenance
	PT_NS	Public Transport Programme 2009/12
	RLTP_NS	Regional Authority Administration 2009/12
	SL_EMERGENCY	Emergency works 2012/15
	SL_MAINT	Maintenance Operations and Renewals 2012/15
	SL_PREVENTIVE	Preventive maintenance 2012/15
	SL_PT	Public Transport 2012/15
	FEASIBILITY	Feasibility or Strategic study
	FEASIBILITY2	Studies and strategy/plan development
	GENERIC	Generic Project
	GENERIC_NS	Generic Project 2009/12
	MINORIMP_NS	Minor improvements 2009/12
	SL_LARGE	Large Projects 2012/15
	SL_MINORIMP	Minor Improvements 2012/15

APPENDIX 3 INVESTMENT DATA ANALYSIS

	Template type	Template description
Baseline activities	BC_EMERGENCY	Emergency 2015-18
	BC_MAINT	Maintenance Operations and Renewals 2015-18
	BC_PT	Public Transport 2015-18
	BC_RSP	Road Safety Promotion 2015-18
	BC_RTC_COSTS	RLTP Management 2015-18
	CC_MAINT	Maintenance programme 2018-21
	CC_PT	Public Transport 2018-21
	CC_RLTP_MGMT	RLTP Management 2018-21
	CC_RSP	Road Safety Promotion 2018-21
	DC_MAINT	Maintenance, operations and renewals 2021-24
	DC_PT	Public transport existing services 2021-24
	DC_RLTP_MGMT	RLTP Management 2021-24
	DC_RSP	Road Safety Promotion 2021-24
	EMERGENCY	Emergency Works
	MAINT_NS	Maintenance 2009/12
	PREVENTIVE_NS	Preventive Maintenance
	PT_NS	Public Transport Programme 2009/12
	RLTP_NS	Regional Authority Administration 2009/12
	SL_EMERGENCY	Emergency works 2012/15
	SL_MAINT	Maintenance Operations and Renewals 2012/15
	SL_PREVENTIVE	Preventive maintenance 2012/15
	SL_PT	Public Transport 2012/15
	SL_SMALL	Small Projects 2012/15
	SL_STUDY	Studies 2012/15
	STANDARD	Standard Project

Topic analysis for investment activities

Overview

National Land Transport Programme (NLTP) data obtained from Waka Kotahi's Transport Investment Online (TIO) system includes various descriptive text fields for transport investment activities and phases within activities. This descriptive text contains information

about the objectives and expected benefits of the investment (among other things). Given the large number of activities in the NLTP, a manual review of this descriptive text is not possible, so automated methods were applied to extract summary information.

The combined descriptive text for each investment activity was analysed using a natural language processing (NLP) algorithm. The aim was to identify potential categories of impacts of transport investments that are not always reflected in activity class or work category classifications. For example, an activity may primarily deliver road improvements and so is classified in a road related activity class, but it may also deliver some improved walking or cycling facilities as part of the project. In addition, text analysis can pick up crosscutting impacts such as “safety” that may be relevant for many investments. The results of this analysis can therefore be used to understand the extent to which impacts of transport investments may extend beyond existing activity class or work category classifications.

Examples

The following examples illustrate the potential for NLP analysis to extract information from descriptive text about activities.

The following description is for an activity that was classed as a road improvement based on activity class and work category but was also included in the cycling, safety, and public transport topics based on the NLP analysis of this text (bold text added to highlight the cycling and public transport features):

> To improve/enhance the road network in line with the CTSP. Annex Road, Birmingham Drive, Wrights Road and Matipo Street are key links in the Middleton Business area and provide access from Blenheim Road and Lincoln Road to the commercial and industrial uses that are located within the area.
>
> - To improve the transport network in line with the CTSP. The CTSP shows the Birmingham to Matipo link (minor arterial route) forms part of the strategic road network, so the route upgrade should be designed to cater for the additional demands on the link because of the Wigram-Magdala Link and maximise journey efficiency and reliability. This will ensure residential and business growth is facilitated in the southwest.
> - Wrights Road (Main distributor) and Annex Road should be designed appropriately for the road hierarchy classification.
> - Freight movements in the immediate area (all links) should be catered for through appropriate design, and conflict between access movements for freight and through movements for general traffic needs to be managed. There is also a freight hub identified in the area, so provision for that function (which is somewhat existing) should be made.
> - **Accommodate the Major Cycleways that route on Annex Road and across Wrights Road. Provide cycle facilities on Birmingham Road and Matipo Street (local cycle routes in the CTSP) and ensure that cycling can be accommodated on Wrights Road.**
> - **Provide bus stops for the existing bus routes and ensure new/future bus routes can be accommodated.**

Based solely on the descriptive text captured in the TIO data, it also appears that, in some cases, the activity class and work category do not reflect the main intent of the activity. For

example, the following descriptive text was provided for an activity in the walking & cycling improvements group (based on its activity class and work category) that appears to relate to road improvements and where the walking and cycling topics were not detected (noting that the provided descriptive text is very brief):

> General roading improvement projects, including bridge widening, passing lanes, and intersection improvements on State Highways throughout the BOP region. Road improvements, including possible realignment, widening, intersection sight improvements, and storm damage slip repair mitigation.

The following activity was classified as a road improvement based on its activity class and work category, but the roads topic was not detected by the NLP analysis, which may reflect a classification error:

> Replace aging timber structure with a new single span structure. To repair a failing restricted bridge that provides sole access to $18,000,000 rural farming land over rail. Failing restricted bridge providing sole access to land valued at $18,000,000 over the North Island Main Trunk Railway.

Limitations

This analysis is limited to identifying potential secondary impacts of transport investments. It cannot determine the extent of those impacts or the quality of the outcomes that were delivered in practice. Understanding the extent and quality of secondary impacts would require a more detailed manual review of investment activities, possibly including an ex-post evaluation of what was delivered. The analysis also depends on the clarity and comprehensiveness of the descriptive text recorded in the NLTP extracts for each activity. Some classification errors do occur, particularly where the descriptive text provided is very brief or uses technical jargon. Despite these limitations, text analysis is a useful way to understand the potential secondary impacts of transport investments and identify activities for further manual analysis if necessary.

Defining descriptive text for activities

Text information in the following fields from the TIO NLTP extracts was combined to create "context text" for each activity (not all fields were available for all activities). Where information in these fields differed across phases of activity, information from all phases was combined to create a single block of context text for each activity.

- Activity description
- Transport problems
- Primary benefit
- Project background
- Project objective
- Phase scope

Topic detection

The "context text" for each activity was analysed using the BART-LARGE-MNLI pretrained NLP model.[45] This model was originally developed by Facebook and can estimate the

[45] https://huggingface.co/facebook/bart-large-mnli

probability that a block of English text relates to a given topic, such as “cycling”.[46] The BART-LARGE-MNLI model was trained using the Multi-Gentre Natural Language Inference (MultiNLI) dataset.[47] This dataset is a collection of 433,000 pairs of sentences that have been classified as a positive entailment (ie, one sentence implies the other), a negative entailment (one sentence contradicts the other), or neural (the sentences are unrelated).

Analysis of this training data allows the NLP model to estimate the probability that two blocks of text relate to similar concepts. When used for topic detection, the NLP model does not simply check for the presence or absence of the topic keyword in the context text. Rather, the NLP model uses a semantic understanding of the English language derived from the training data to determine whether the context text relates to a topic expressed by a keyword, even if that keyword itself is not included in the text.

Given that transport activities may be described in various ways, a set of topic keywords were checked for each activity (Table 5). The NLP model returns the probability that the context text for each activity relates to the topic implied by each of the 13 keywords. The highest probability across all keywords in each of the five topics was used as the probability that the context text related to that topic. If the estimated probability of the context text for an activity relating to a topic was greater than 0.5, the activity was assigned to that topic. It is possible for an activity to belong to more than one topic, depending on the estimated probabilities across all keywords.

Table 5 Topics and keywords used in the topic analysis

Topic	Topic keywords
Walking	walking, pedestrians
Cycling	cycling, bicycles
Roads	roads, highways, driving, cars
Public transport	trains, railways, buses, ferries
Safety	safety

Results of topic analysis

Figure 18 illustrates the results of this analysis by showing the estimated probability of each of the five topics for activities in three improvements groups based on activity class and work categories assigned to NLTP activities. In general, high probabilities (greater than 0.5) are estimated for the topic(s) like the analysis group, eg, the roads topic was detected with high probability for most road improvement activities and walking and cycling topics were detected for most walking and cycling improvement activities. The safety topic was also frequently detected for roads and walking and cycling improvements, but less so for public transport improvements.

It is also apparent that analysis groups do not always capture the full objectives or intent of each activity, as topics unrelated to the analysis group were detected with high probability for

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46 Topic detection is done using a method known as zero-shot sequence classification. For an overview, see https://joeddav.github.io/blog/2020/05/29/ZSL.html.

47 https://huggingface.co/datasets/multi_nli

some activities (eg, walking and cycling topics for road improvements). These results are also affected by some classification errors, eg, some of the road improvement activities where the roads topic was detected with low probability may be incorrect.

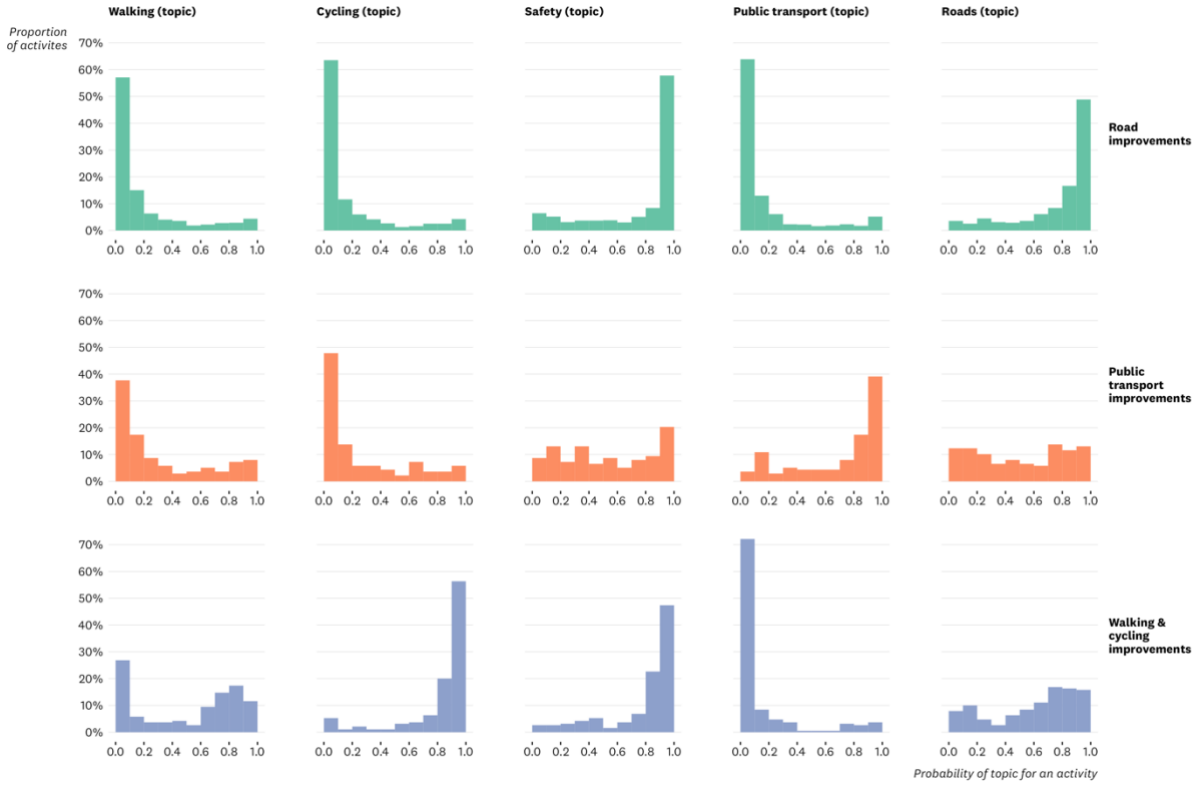

Figure 18 Results of automated topic analysis applied to transport projects in the analysis dataset

Despite the limitations noted above, a manual review of the topics detected for a sample of activities suggested that the NLP topic detection worked very well. A random sample of 50 activities was manually reviewed, and of these, 78% were judged to be classified correctly across all five topics described above. Given the available descriptive text, 18% had one error and four correct topics, and 4% had more than one error.

Definition of analysis groups

Table 6 gives details of how activities in the NLTP extracts were assigned to the eight analysis groups used in the analysis (or excluded). Activities were assigned to analysis groups based on the combination of funding source, activity class, and work category.

Table 6 Analysis groups definitions

Analysis group	Funding source	Activity class	Work category
ACTIVITIES EXCLUDED FROM ANALYSIS	(blank)	(blank)	(blank)
	(blank)	External funding	Road improvements
	AC 31 - Canterbury earthquake fund	External funding	Emergency works
	AC 31 - Crown funding for Napier - Gisborne SH	External funding	Road improvements
	Debt Funding - Auckland Accelerated Programme	Debt Funding	Property purchase (State highways)
	Debt Funding - Auckland Accelerated Programme	Debt Funding	Road improvements
	Debt Funding - Canterbury earthquake fund	Debt Funding	Emergency works
	Debt Funding - Housing Infrastructure Fund	Debt Funding	Advance property purchase
	Debt Funding - Housing Infrastructure Fund	Debt Funding	New roads
	Debt Funding - Housing Infrastructure Fund	Debt Funding	Property purchase (local roads)
	Debt Funding - Housing Infrastructure Fund	Debt Funding	Road improvements
	External funding - CAS Operational Support	External funding	Management of the funding allocation system
	External funding - CAS Operational Support	External funding	Programme management

Analysis group	Funding source	Activity class	Work category
	External funding - Community Connect programme	External funding	(blank)
	External funding - COVID-19 funding	External funding	Bus services
	External funding - COVID-19 funding	External funding	Cycling facilities
	External funding - COVID-19 funding	External funding	Financial grants
	External funding - COVID-19 funding	External funding	New roads
	External funding - COVID-19 funding	External funding	Passenger ferry services
	External funding - COVID-19 funding	External funding	Passenger rail services
	External funding - COVID-19 funding	External funding	Passenger transport facilities operations and maintenance
	External funding - COVID-19 funding	External funding	Passenger transport infrastructure
	External funding - COVID-19 funding	External funding	Public transport facilities operations and maintenance
	External funding - COVID-19 funding	External funding	Public transport improvements, major renewals and minor improvements
	External funding - COVID-19 funding	External funding	Public transport information operations and maintenance
	External funding - COVID-19 funding	External funding	Public transport information supply, operations and maintenance
	External funding - COVID-19 funding	External funding	Public transport infrastructure and major renewals
	External funding - COVID-19 Recovery and Response Fund (CIP)	External funding	(blank)

Analysis group	Funding source	Activity class	Work category
	External funding - COVID-19 Recovery and Response Fund (CIP)	External funding	Property purchase (State highways)
	External funding - COVID-19 Recovery and Response Fund (CIP)	External funding	Replacement of bridges and other structures
	External funding - COVID-19 Recovery and Response Fund (CIP)	External funding	Road improvements
	External funding - Crown funding for Napier - Gisborne SH	External funding	Road improvements
	External funding - Cycling Education	External funding	Promotion, education and advertising
	External funding - Infrastructure Fund (Capital Investment Package)	External funding	Cycling facilities
	External funding - Infrastructure Fund (Capital Investment Package)	External funding	New roads
	External funding - Infrastructure Fund (Capital Investment Package)	External funding	Property purchase (State highways)
	External funding - Infrastructure Fund (Capital Investment Package)	External funding	Road improvements
	External funding - Kaikoura Earthquake Fund	External funding	Emergency works
	External funding - Kaikoura Earthquake Fund	External funding	Financial grants
	External funding - Provincial Growth Fund	External funding	Cycling facilities
	External funding - Provincial Growth Fund	External funding	Emergency works
	External funding - Provincial Growth Fund	External funding	Management of the funding allocation system

Analysis group	Funding source	Activity class	Work category
	External funding - Provincial Growth Fund	External funding	Programme management
	External funding - Provincial Growth Fund	External funding	Property purchase (State highways)
	External funding - Provincial Growth Fund	External funding	Road improvements
	External funding - Regional Accelerated Programme	External funding	New roads
	External funding - Regional Accelerated Programme	External funding	Property purchase (State highways)
	External funding - Regional Accelerated Programme	External funding	Replacement of bridges and other structures
	External funding - Regional Accelerated Programme	External funding	Road improvements
	External funding - Regional Investment Opportunities	External funding	Resilience improvements
	External funding - Regional Investment Opportunities	External funding	Road improvements
	External funding - *Supergold* card	External funding	*SuperGold* trip payments
	External funding - Urban Cycling Programme	External funding	Cycling facilities
	NLTF	(blank)	(blank)
	NLTF	(blank)	Minor improvements
	NLTF	(blank)	Sea freight infrastructure
	NLTF	Coastal shipping	Sea freight infrastructure

Analysis group	Funding source	Activity class	Work category
	NLTF	Public transport	*SuperGold* trip payments
	NLTF	Public transport services	SuperGold trip payments
Investment management, planning & sector research	NLTF	(blank)	Activity management planning
	NLTF	(blank)	Activity management planning improvement
	NLTF	Investment management (incl. Transport Planning)	Activity management planning improvement
	NLTF	Investment management (incl. Transport Planning)	Management of the funding allocation system
	NLTF	Investment management (incl. Transport Planning)	Programme Business Case Development
	NLTF	Investment management (incl. Transport Planning)	Regional land transport planning management
	NLTF	Investment management (incl. Transport Planning)	Sector research
	NLTF	Investment management (incl. Transport Planning)	Transport model development
	NLTF	Management of the funding allocation system	Programme management
	NLTF	Sector training and research	Sector research
	NLTF	Sector training and research	Sector training

Analysis group	Funding source	Activity class	Work category
	NLTF	Transport planning	Activity management planning
	NLTF	Transport planning	Programme Business Case Development
	NLTF	Transport planning	Programme management
	NLTF	Transport planning	Regional land transport planning management
	NLTF	Transport planning	Sector research
	NLTF	Transport planning	Studies and strategies
Public transport improvements	NLTF	(blank)	Low cost / low risk public transport improvements
	NLTF	(blank)	Public transport improvements, major renewals and minor improvements
	NLTF	(blank)	Rapid Transit Infrastructure
	NLTF	(blank)	Transitional Rail Infrastructure
	NLTF	Public transport	Low cost / low risk public transport improvements
	NLTF	Public transport	Public transport improvements, major renewals and minor improvements
	NLTF	Public transport	Public transport infrastructure and major renewals
	NLTF	Public transport infrastructure	(blank)
	NLTF	Public transport infrastructure	Low cost / low risk public transport improvements
	NLTF	Public transport infrastructure	Passenger transport infrastructure

Analysis group	Funding source	Activity class	Work category
	NLTF	Public transport infrastructure	Property purchase (State highways)
	NLTF	Public transport infrastructure	Public transport infrastructure and major renewals
	NLTF	Public transport infrastructure	Rapid Transit Infrastructure
	NLTF	Public transport infrastructure	Transitional Rail Infrastructure
	NLTF	Public transport services	Low cost / low risk public transport improvements
	NLTF	Public transport services	Passenger transport infrastructure
	NLTF	Rail network	(blank)
	NLTF	Rapid Transit	Rapid Transit Infrastructure
	NLTF	Transitional Rail	Transitional Rail Infrastructure
Public transport services, maintenance, operation & renewals	NLTF	(blank)	Public transport facilities operations and maintenance
	NLTF	Public transport	(blank)
	NLTF	Public transport	Bus services
	NLTF	Public transport	Passenger ferry services
	NLTF	Public transport	Passenger rail services
	NLTF	Public transport	Public transport facilities operations and maintenance
	NLTF	Public transport	Public transport information supply, operations and maintenance

Analysis group	Funding source	Activity class	Work category
	NLTF	Public transport	Total mobility operations
	NLTF	Public transport	Total mobility wheelchair hoist use payments
	NLTF	Public transport	Travel demand management
	NLTF	Public transport	Wheelchair hoists
	NLTF	Public transport infrastructure	Passenger transport facilities operations and maintenance
	NLTF	Public transport infrastructure	Public transport facilities operations and maintenance
	NLTF	Public transport services	(blank)
	NLTF	Public transport services	Bus services
	NLTF	Public transport services	Demand management
	NLTF	Public transport services	Passenger ferry services
	NLTF	Public transport services	Passenger rail services
	NLTF	Public transport services	Passenger transport facilities operations and maintenance
	NLTF	Public transport services	Public transport information operations and maintenance
	NLTF	Public transport services	Total mobility operations
	NLTF	Public transport services	Total mobility wheelchair hoist use payments
	NLTF	Public transport services	Wheelchair hoists

Analysis group	Funding source	Activity class	Work category
Road improvements	NLTF	(blank)	New traffic management facilities
	NLTF	(blank)	Property purchase (local roads)
	NLTF	(blank)	Property purchase (State highways)
	NLTF	(blank)	Road improvements
	NLTF	Local road improvements	Advance property purchase
	NLTF	Local road improvements	Low cost / low risk improvements
	NLTF	Local road improvements	Minor improvements
	NLTF	Local road improvements	New roads
	NLTF	Local road improvements	New traffic management facilities
	NLTF	Local road improvements	Property purchase (local roads)
	NLTF	Local road improvements	Replacement of bridges and other structures
	NLTF	Local road improvements	Resilience improvements
	NLTF	Local road improvements	Road improvements
	NLTF	Local road improvements	Seal extension
	NLTF	New & improved infrastructure for local roads	Advance property purchase
	NLTF	New & improved infrastructure for local roads	Minor improvements

Analysis group	Funding source	Activity class	Work category
	NLTF	New & improved infrastructure for local roads	New roads
	NLTF	New & improved infrastructure for local roads	New traffic management facilities
	NLTF	New & improved infrastructure for local roads	Property purchase (local roads)
	NLTF	New & improved infrastructure for local roads	Replacement of bridges and other structures
	NLTF	New & improved infrastructure for local roads	Resilience improvements
	NLTF	New & improved infrastructure for local roads	Road improvements
	NLTF	New & improved infrastructure for local roads	Seal extension
	NLTF	New & improved infrastructure for State highways	Minor improvements
	NLTF	New & improved infrastructure for State highways	New roads
	NLTF	New & improved infrastructure for State highways	New traffic management facilities
	NLTF	New & improved infrastructure for State highways	Property purchase (State highways)
	NLTF	New & improved infrastructure for State highways	Replacement of bridges and other structures

Analysis group	Funding source	Activity class	Work category
	NLTF	New & improved infrastructure for State highways	Resilience improvements
	NLTF	New & improved infrastructure for State highways	Road improvements
	NLTF	New & improved infrastructure for State highways	Seal extension
	NLTF	Regional Improvements	Low cost / low risk improvements
	NLTF	Regional Improvements	Minor improvements
	NLTF	Regional Improvements	New roads
	NLTF	Regional Improvements	New traffic management facilities
	NLTF	Regional Improvements	Property purchase (State highways)
	NLTF	Regional Improvements	Replacement of bridges and other structures
	NLTF	Regional Improvements	Resilience improvements
	NLTF	Regional Improvements	Road improvements
	NLTF	Regional Improvements	Seal extension
	NLTF	Renewal of local roads	Associated improvements
	NLTF	Renewal of State highways	Associated improvements
	NLTF	Road to Zero	Low cost / low risk improvements
	NLTF	Road to Zero	New traffic management facilities

Analysis group	Funding source	Activity class	Work category
	NLTF	Road to Zero	Property purchase (local roads)
	NLTF	Road to Zero	Property purchase (State highways)
	NLTF	Road to Zero	Road improvements
	NLTF	State highway improvements	Low cost / low risk improvements
	NLTF	State highway improvements	Minor improvements
	NLTF	State highway improvements	New roads
	NLTF	State highway improvements	New traffic management facilities
	NLTF	State highway improvements	Property purchase (State highways)
	NLTF	State highway improvements	Replacement of bridges and other structures
	NLTF	State highway improvements	Resilience improvements
	NLTF	State highway improvements	Road improvements
	NLTF	State highway improvements	Seal extension
Road maintenance, operation & renewals	NLTF	Local road maintenance	(blank)
	NLTF	Local road maintenance	Drainage renewals
	NLTF	Local road maintenance	Emergency works
	NLTF	Local road maintenance	Environmental maintenance
	NLTF	Local road maintenance	Environmental renewals

Analysis group	Funding source	Activity class	Work category
	NLTF	Local road maintenance	Financial grants
	NLTF	Local road maintenance	Level crossing warning devices
	NLTF	Local road maintenance	Minor events
	NLTF	Local road maintenance	Network and asset management
	NLTF	Local road maintenance	Operational traffic management
	NLTF	Local road maintenance	Preventive maintenance
	NLTF	Local road maintenance	Routine drainage maintenance
	NLTF	Local road maintenance	Sealed pavement maintenance
	NLTF	Local road maintenance	Sealed road pavement rehabilitation
	NLTF	Local road maintenance	Sealed road resurfacing
	NLTF	Local road maintenance	Structures component replacements
	NLTF	Local road maintenance	Structures maintenance
	NLTF	Local road maintenance	Traffic services maintenance
	NLTF	Local road maintenance	Traffic services renewals
	NLTF	Local road maintenance	Unsealed pavement maintenance
	NLTF	Local road maintenance	Unsealed road metalling
	NLTF	Maintenance and operation of local roads	(blank)

Analysis group	Funding source	Activity class	Work category
	NLTF	Maintenance and operation of local roads	Drainage renewals
	NLTF	Maintenance and operation of local roads	Emergency works
	NLTF	Maintenance and operation of local roads	Environmental maintenance
	NLTF	Maintenance and operation of local roads	Environmental renewals
	NLTF	Maintenance and operation of local roads	Financial grants
	NLTF	Maintenance and operation of local roads	Level crossing warning devices
	NLTF	Maintenance and operation of local roads	Minor events
	NLTF	Maintenance and operation of local roads	Network and asset management
	NLTF	Maintenance and operation of local roads	Operational traffic management
	NLTF	Maintenance and operation of local roads	Preventive maintenance
	NLTF	Maintenance and operation of local roads	Routine drainage maintenance
	NLTF	Maintenance and operation of local roads	Sealed pavement maintenance

Analysis group	Funding source	Activity class	Work category
	NLTF	Maintenance and operation of local roads	Sealed road pavement rehabilitation
	NLTF	Maintenance and operation of local roads	Sealed road resurfacing
	NLTF	Maintenance and operation of local roads	Structures component replacements
	NLTF	Maintenance and operation of local roads	Structures maintenance
	NLTF	Maintenance and operation of local roads	Traffic services maintenance
	NLTF	Maintenance and operation of local roads	Traffic services renewals
	NLTF	Maintenance and operation of local roads	Unsealed pavement maintenance
	NLTF	Maintenance and operation of local roads	Unsealed road metalling
	NLTF	Maintenance and operation of State highways	(blank)
	NLTF	Maintenance and operation of State highways	Drainage renewals
	NLTF	Maintenance and operation of State highways	Emergency works
	NLTF	Maintenance and operation of State highways	Environmental maintenance

Analysis group	Funding source	Activity class	Work category
	NLTF	Maintenance and operation of State highways	Environmental renewals
	NLTF	Maintenance and operation of State highways	Level crossing warning devices
	NLTF	Maintenance and operation of State highways	Minor events
	NLTF	Maintenance and operation of State highways	Network and asset management
	NLTF	Maintenance and operation of State highways	Operational traffic management
	NLTF	Maintenance and operation of State highways	Preventive maintenance
	NLTF	Maintenance and operation of State highways	Property management (State highways)
	NLTF	Maintenance and operation of State highways	Routine drainage maintenance
	NLTF	Maintenance and operation of State highways	Sealed pavement maintenance
	NLTF	Maintenance and operation of State highways	Sealed road pavement rehabilitation
	NLTF	Maintenance and operation of State highways	Sealed road resurfacing
	NLTF	Maintenance and operation of State highways	Structures component replacements

Analysis group	Funding source	Activity class	Work category
	NLTF	Maintenance and operation of State highways	Structures maintenance
	NLTF	Maintenance and operation of State highways	Traffic services maintenance
	NLTF	Maintenance and operation of State highways	Traffic services renewals
	NLTF	Maintenance and operation of State highways	Unsealed pavement maintenance
	NLTF	Maintenance and operation of State highways	Unsealed road metalling
	NLTF	Renewal of local roads	Drainage renewals
	NLTF	Renewal of local roads	Environmental renewals
	NLTF	Renewal of local roads	Preventive maintenance
	NLTF	Renewal of local roads	Sealed road pavement rehabilitation
	NLTF	Renewal of local roads	Sealed road resurfacing
	NLTF	Renewal of local roads	Structures component replacements
	NLTF	Renewal of local roads	Traffic services renewals
	NLTF	Renewal of local roads	Unsealed road metalling
	NLTF	Renewal of State highways	Drainage renewals
	NLTF	Renewal of State highways	Environmental renewals

Analysis group	Funding source	Activity class	Work category
	NLTF	Renewal of State highways	Preventive maintenance
	NLTF	Renewal of State highways	Sealed road pavement rehabilitation
	NLTF	Renewal of State highways	Sealed road resurfacing
	NLTF	Renewal of State highways	Structures component replacements
	NLTF	Renewal of State highways	Traffic services renewals
	NLTF	Renewal of State highways	Unsealed road metalling
	NLTF	State highway maintenance	(blank)
	NLTF	State highway maintenance	Drainage renewals
	NLTF	State highway maintenance	Emergency works
	NLTF	State highway maintenance	Environmental maintenance
	NLTF	State highway maintenance	Environmental renewals
	NLTF	State highway maintenance	Level crossing warning devices
	NLTF	State highway maintenance	Minor events
	NLTF	State highway maintenance	Network and asset management
	NLTF	State highway maintenance	Operational traffic management
	NLTF	State highway maintenance	Preventive maintenance
	NLTF	State highway maintenance	Property management (State highways)
	NLTF	State highway maintenance	Routine drainage maintenance

Analysis group	Funding source	Activity class	Work category
	NLTF	State highway maintenance	Sealed pavement maintenance
	NLTF	State highway maintenance	Sealed road pavement rehabilitation
	NLTF	State highway maintenance	Sealed road resurfacing
	NLTF	State highway maintenance	Structures component replacements
	NLTF	State highway maintenance	Structures maintenance
	NLTF	State highway maintenance	Traffic services maintenance
	NLTF	State highway maintenance	Traffic services renewals
	NLTF	State highway maintenance	Unsealed pavement maintenance
	NLTF	State highway maintenance	Unsealed road metalling
Road safety promotion, road policing & demand management	NLTF	(blank)	Promotion, education and advertising
	NLTF	(blank)	Road policing
	NLTF	Local road improvements	Travel demand management
	NLTF	New & improved infrastructure for local roads	Demand management
	NLTF	New & improved infrastructure for State highways	Demand management
	NLTF	Promotion of road safety and demand management	Promotion, education and advertising

Analysis group	Funding source	Activity class	Work category
	NLTF	Promotion of road safety and demand management	Travel demand management
	NLTF	Road policing	Road policing
	NLTF	Road safety promotion	Demand management
	NLTF	Road safety promotion	Promotion, education and advertising
	NLTF	Road safety promotion	Travel demand management
	NLTF	Road to Zero	Activity management planning improvement
	NLTF	Road to Zero	Promotion, education and advertising
	NLTF	Road to Zero	Road policing
	NLTF	State highway improvements	Travel demand management
Walking & cycling improvements	NLTF	Walking and cycling	Cycling facilities
	NLTF	Walking and cycling	Demand management
	NLTF	Walking and cycling	Minor improvements
	NLTF	Walking and cycling	Property purchase (State highways)
	NLTF	Walking and cycling	Walking facilities
	NLTF	Walking and cycling improvements	Cycling facilities
	NLTF	Walking and cycling improvements	Low cost / low risk improvements

Analysis group	Funding source	Activity class	Work category
	NLTF	Walking and cycling improvements	Minor improvements
	NLTF	Walking and cycling improvements	Property purchase (State highways)
	NLTF	Walking and cycling improvements	Travel demand management
	NLTF	Walking and cycling improvements	Walking facilities
Walking & cycling maintenance, operation & renewals	NLTF	Local road maintenance	Cycle path maintenance
	NLTF	Local road maintenance	Footpath maintenance
	NLTF	Maintenance and operation of local roads	Cycle path maintenance
	NLTF	Maintenance and operation of local roads	Footpath maintenance
	NLTF	Maintenance and operation of State highways	Cycle path maintenance
	NLTF	Maintenance and operation of State highways	Footpath maintenance
	NLTF	State highway maintenance	Cycle path maintenance
	NLTF	State highway maintenance	Footpath maintenance

Grouping of actual expenditure data

Data on actual transport expenditure by year and category obtained from Waka Kotahi's website was re-categorised as follows for analysis:

Expenditure type	Work category	Analysis category
Investment management	n/a	Investment management
Road safety promotion	n/a	Roads: Road safety promotion
Public transport	Administration – General	PT: Other
	PT administration & management	PT: Other
	PT information	PT: Services & information
	PT infrastructure development	PT: Infrastructure
	PT infrastructure maintenance & renewals	PT: Maintenance & renewals
	PT services	PT: Services & information
	SuperGold Card	PT: Other
	Total Mobility	PT: Other
Roads	Administration – General	Roads: Other
	Bridges & structures replacement	Roads: Maintenance & renewals
	Minor improvements	Roads: Infrastructure
	New roads & bridges	Roads: Infrastructure
	Professional services	Roads: Other
	Property purchase	Roads: Infrastructure
	Resilience improvements	Roads: Infrastructure
	Road reconstruction	Roads: Maintenance & renewals
	Traffic management	Roads: Other
Maintenance & renewals	Administration – General	Roads: Maintenance & renewals
	Corridor	Roads: Maintenance & renewals
	Cycling facilities	Walking & cycling: Maintenance & renewals
	Emergency reinstatement	Roads: Maintenance & renewals

Expenditure type	Work category	Analysis category
	Environment & drainage	Roads: Maintenance & renewals
	Financial grants & stimulus	Roads: Maintenance & renewals
	Footpath	Walking & cycling: Maintenance & renewals
	Network & property management	Roads: Maintenance & renewals
	Pavement & seal	Roads: Maintenance & renewals
	Structures	Roads: Maintenance & renewals
Walking & cycling	Cycling facilities	Walking & cycling: Infrastructure
	Walking facilities	Walking & cycling: Infrastructure
	Emergency reinstatement	Walking & cycling: Maintenance & renewals
	Administration – General	Walking & cycling: Other

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