



ROAD TO ZERO SPEED AND INFRASTRUCTURE PROGRAMME BUSINESS CASE

WAKA KOTAHI NZ TRANSPORT AGENCY

27 JANUARY 2021

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Glossary of terms

Acronym / Terminology	Description
ABS	Anti-lock Braking Systems
ACC	The Accident Compensation Corporation
APM	Area Programme Manager
ATP	Audio Tactile Profiled
BCR	Benefit Cost Ratio
Benefit	A Specific, Measurable, Achievable, Realistic and Timebound metric that demonstrates the successful delivery of the Programme or Project.
CFO	Chief Financial Officer
DCE	Deputy Chief Executive
Deliverable	An output within a particular phase of a project lifecycle. This output could be a report, decision, cost estimate etc. A Feasibility Report is an example of a deliverable. The installation of a median barrier is also a deliverable.
DSI	Death and Serious Injury
E&P	Engagement and Partnerships Waka Kotahi business group
ECI	Early Contractor Involvement
EEM	Economic Evaluation Manual
ELT	Executive Leadership Team
GM	General Manager
GPS	Government Policy Statement
IAF	Investment Assessment Framework
IILM	Integrated Intervention Logic Model. This is used to calculate potential savings in DSIs through a combination of interventions, working in tandem, across all parts of the transport system.
Intervention	This follows the 'Standard Safety Intervention' definition where an intervention is a method to improve the existing built infrastructure. A project may contain one or multiple interventions. A rural roundabout is an example of a standard safety intervention at an intersection. Shoulder widening is an example SSI for a corridor.
IQA	Independent Quality Assurance
IRR	Infrastructure Risk Rating
KPI	Key Performance Indicator
LCLR	Low Cost Low Risk
MOT	Ministry of Transport
NLTP	National Land Transport Programme (NLTP 1: 2021-24, NLTP: 2 2024-27, NLTP 3: 2027-30)

Acronym / Terminology	Description
OECD	Organisation for Economic Co-operation and Development
ONRC	One Network Road Classification. This is a classification system which divides New Zealand's roads into six categories based on how busy they are, whether they connect to important destinations or are the only route available.
OPPP	Operational Policy, Planning and Performance Waka Kotahi business group
Outcome	A result or consequence of completing phases or projects. A reduction in DSIs is an outcome of the completion of a SIP project.
PBC	Programme Business Case
Phase	A phase is a collection of activities that are dependent upon one another. Typically, a phase will run one after another. A single phase will have one organisation or agency responsible for delivery. It facilitates the advance or delay to project delivery. Examples include Feasibility or Construction.
PLA	Price Level Adjustment
Programme	A collection of projects to deliver a desired strategic outcome such as Safe Network Programme
Project Lifecycle	A sequential list of phases through which a project progresses – a full end-to-end description of all the phases in which a project can reside.
P3M3	Portfolio, Programme and Project management approach
RASCI model	Responsible, Accountable, Supporting, Consulted and Informed model
RCA	Road Controlling Authority. An RCA is responsible for the management of sections of road. For local roads, local councils are the RCA and for State Highways Waka Kotahi is the RCA.
RIAWS	Rural Intersection Advanced Warning Sign
RLTP	Regional Land Transport Plan
Road Safety Outcomes Framework	A proposed framework to measure outcomes, through intervention indicators, safety performance indicators and outcome indicators
RS	Regulatory Services Waka Kotahi business group
RTC	Regional Transport Committees
Safe System	An internationally proven approach to road safety
SELT	Speed Executive Leadership Team sub-committee
SH&E	Safety, Health and Environment team
SIP	Speed and Infrastructure Programme
SME	Subject Matter Expert
SNP	Safe Network Programme
SNP Project	A distinct set of activities to deliver an output that is cost and time bound. An SNP project means the primary outcome of the project is safety and it is eligible for consideration or approved as part of the Safe Network Programme scope. An SNP project may be a speed or infrastructure change.
SRA	Safe Roads Alliance

Acronym / Terminology	Description
SSBC / SSBC Lite	Single Stage Business Case / Single Stage Business Case Lite
SSI	Standard Safety Intervention
SST	Safe System Transformation
Sub-programme	A collection of projects that can be grouped together such as State Highways, Local Road or Speed Management.
TEFAR	Targeted Enhanced Funding Assistance Rates
TS	Transport Services Waka Kotahi business group
TSG	Transport Services Group
Vision Zero	The vision of <i>Road to Zero</i> , of a New Zealand where no one is killed or seriously injured in road crashes
VKT	Vehicle Kilometres Travelled
WKIP	Waka Kotahi Investment Proposal

Note: This Speed and Infrastructure Programme Business Case should be read in conjunction with a suite of wider *Road to Zero* documents, including:

- [Road to Zero: New Zealand's Road Safety Strategy for 2020-2030](#)
- [Road to Zero: Initial Action Plan for 2020-2022](#)
- [Road Safety Strategy: Updated Cabinet Paper and Consultation Document for Cross-Party Consultation](#)

Executive summary

Introduction

This Programme Business Case (PBC) outlines the case for investment in the Waka Kotahi NZ Transport Agency (Waka Kotahi) Speed and Infrastructure Programme (SIP) to help progress New Zealand's road safety strategy – *Road to Zero* 2030.

It is estimated that the Speed and Infrastructure Programme (SIP) will contribute around half of all the Death and Serious Injury (DSI) savings required to meet the *Road to Zero* Strategy target of a 40 percent reduction in DSIs by 2030.

The recommendations of this PBC is for the Waka Kotahi Board to:

- **Endorse** the *Road to Zero* Speed and Infrastructure Programme Business Case 2021-2030 and approve the next steps to implementation.
- **Endorse** the recommended Speed and Infrastructure Programme 2021-2030 for local roads and state highways which will contribute to the overall *Road to Zero* target of 40 percent reduction in deaths and serious injuries at a cost of \$4.96 billion with a benefit cost ratio of 2.1 to 2.3 and deliver:
 - 17,286 km of road corridor speed only interventions
 - 854 km of corridor treated with median barriers including supporting measures
 - 4,448 km of road corridor safety improvements (wide centreline, roadside barriers, rumble strips)
 - 760 safe system intersection improvements (roundabouts or raised safety platforms)
 - 957 intersection safety improvements (speed zones, turning bays, improved visibility, and removal of right turn movement).
- **Note** that the recommended Speed and Infrastructure Programme 2021-2030 will deliver 535 DSI savings which is short of the target 635. The programme has been developed in response to the strategic modelling and incorporates extensive consultation with local representatives and Road Controlling Authorities to “ground-truth” and present a deliverable programme. All efforts will be made to further develop the programme and pursue opportunities to achieve the necessary outcome / target or better as implementation progresses.
- **Allocate** \$1.1 billion funding for the first three years of the Speed and Infrastructure Programme, subject to the outcome of the 2021-24 National Land Transport Fund decision in coming months.
- **Note** that whilst the proposed funding levels in the Waka Kotahi Investment Proposal 2021-31 support the ten year Speed and Infrastructure Programme, there is a shortfall in the draft funding allocation for the first three years of the programme which could impact on delivery of the programme and achievement of the *Road to Zero* targets by 2030.

This PBC builds on the current 2018-21 Safe Network Programme (SNP)¹ and seeks Waka Kotahi Board support for changes to the management and implementation of the 2021-24 SIP based on lessons learnt over the current National Land Transport Programme period.

¹ The SNP aims to achieve 151 fewer deaths (227 remaining) and 1,120 fewer serious injuries (1,680) by the year 2030, a 40 percent reduction on current projected deaths and serious injuries. Modelling suggests that a business as usual approach will only reduce deaths and serious injuries by about 10 percent by 2030.

Strategic Context

The SIP forms a key part of New Zealand's road safety strategy, *Road to Zero 2030*, which was developed by the Ministry of Transport (MOT) and endorsed by Cabinet in December 2019. The strategy adopts a Vision Zero position:

“Our vision is a New Zealand where no one is killed or seriously injured in road crashes. This means that no death or serious injury while travelling on our roads is acceptable.”

In April 2018, Cabinet provided its agreement to commence the development of a new national road safety strategy to address New Zealand's poor road safety record^{2,3}. As part of developing the *Road to Zero* Strategy several scenarios were considered, including the development of target DSI reduction options ranging from 30 percent to 60 percent (from a 2018 baseline).

In May 2019, the MOT submitted a briefing to Ministers detailing each of these target options for consideration. Achieving the 40 percent target was selected by Cabinet. In December 2019, the government launched *Road to Zero: New Zealand's road safety strategy 2020-2030*.

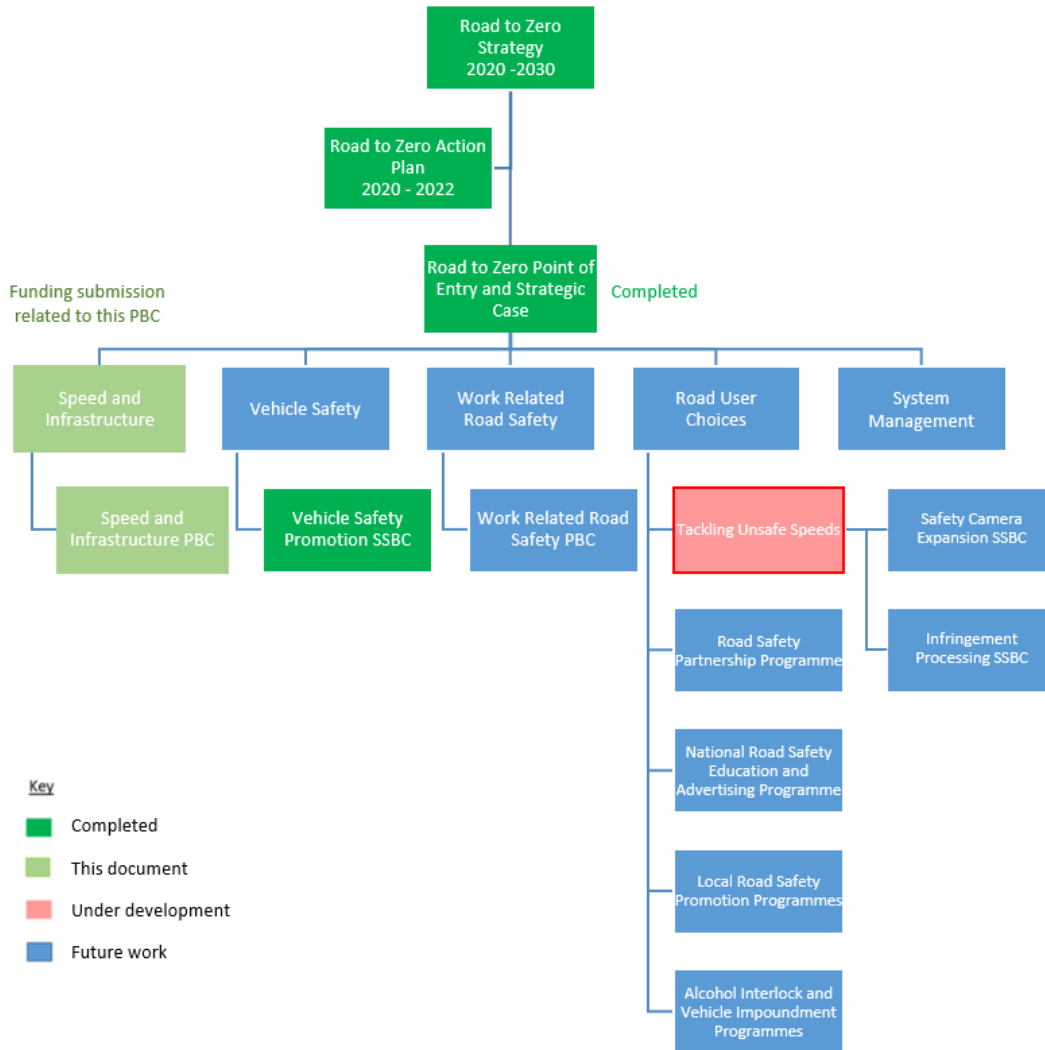
A *Road to Zero* Strategic Case was developed in July 2020 and supports the development of a series of business cases and/or investment programmes to address the problems identified in the *Road to Zero* Strategy and achieve the desired reduction in harm to communities.

Speed and Infrastructure is one of *Road to Zero's* five focus areas. This PBC seeks approval and funding to deliver the SIP, but also provides the overarching strategic case and context for investment in the other four focus areas (Vehicle Safety, Work Related Safety, Road User Choices and System Management). Figure 1 provides an overview of the work that has been completed to date and work that is underway or planned to secure investment and progress each of the five *Road to Zero* focus areas.

² <https://www.transport.govt.nz/assets/Uploads/Our-Work/Documents/REDACTED-Improving-Road-Safety-in-New-Zealand-Redacted.pdf>

³ <https://www.beehive.govt.nz/release/no-loss-life-acceptable>

Figure 1 Road to Zero Implementation Overview



The Current Safe Network Programme (2018-21 NLTP)

In 2018, \$1.05 billion was endorsed by the Waka Kotahi board to implement safety improvements. This included \$532 million for safety improvements on state highways and \$515 million for local roads. A further \$146 million was identified for state highways and \$259 million for local roads in the 2018-21 NLTP, resulting in a total potential programme of \$1.4 billion. The current programme is forecasting approximately \$1 billion to be spent across state highways and local roads by the end of the current 2018-21 NLTP period.

The SNP was developed under the previous government’s Safer Journeys strategy (2010-2020) and is on track to prevent 160 DSI’s each year. This compares to the target reduction of 636 DSI’s year required to meet the 40 percent reduction by 2030 (76 fewer people killed, and 560 fewer people seriously injured per year).

Problem Statements

The following problems relating to the SIP were discussed at a workshop held in July 2020 with Waka Kotahi representatives. The first problem statement reflects the road safety issues and *Road to Zero* approach. The second problem statement relates to the challenges of delivering a large and complex programme of works and is based on lessons that have been learnt from the 2018-21 NLTP period.

1. *The road network in New Zealand was largely designed and is still operated outside the bounds of human injury tolerance, resulting in unacceptable levels of harm for our community.*

2. *The planning, investment and delivery of road safety improvements does not effectively support the delivery of large programmes of improvements with a high number of capital works, this limits our ability to continuously improve customers' safety in a timely manner and on a large scale.*

Benefits

The key benefits identified for the SIP PBC include:

1. A reduction in death and serious injury crashes where speed and infrastructure are identified as a contributing factor
2. Timely delivery of safety improvements

The primary and most important benefit is the lives saved and the reduction in serious injuries to road users by creating a safer transport network.

Investment Objectives and Key Performance Indicators

The Investment Objectives relating to Speed and Infrastructure are outlined below as well as the supporting Key Performance Indicators.

The Key Performance Indicators measure investment efforts, and the impact of these efforts on system performance and reducing DSIs.

1. A reduction in death and serious injury crashes where speed and infrastructure are identified as a contributing factor
 - i. Percentage of Vehicle Kilometres Travelled (VKT) on roads with speed limit above 80km/h that have a median barrier
 - ii. Number head-on and run-off-road DSIs
 - iii. Number of DSIs where the speed limit does not align with safe and appropriate speed
 - iv. Percentage of road network where speed limits align with safe and appropriate speed
2. Timely delivery of safety improvements
 - i. Kilometres of the network treated with median barriers
 - ii. Kilometres of the network treated with reduced speed limits

Programme Development and Assessment

To achieve the target of a 40 percent reduction in DSI's by 2030, the SIP was developed and assessed using the following iterations of the programme:

- Ten-year Strategic Model (2021-30) that was used to inform the *Road to Zero* Strategy
- Ten-year Strategic Implementation Programme (2021-30) that outlines the scale of investment required over the next ten years to meet the *Road to Zero* outcomes
- SIP Delivery Programme – the activities planned for inclusion in the 2021-24 NLTP is created that details the packages of projects that will be started in the 2021-24 period, based on GPS prioritisation and the available funding in the activity class.

The Strategic Model was developed at a high level to provide indicative estimates, and ground-truthing was required to establish the exact nature of interventions, costs and safety benefits for each element within the ten-year Strategic Implementation Programme (2021-30) and the SIP Delivery Programme (2021-24).

Management Case

The Management Case outlines how Waka Kotahi will work with partners and streamline current processes to deliver a significant reduction in DSI's and value for money. The Management Case of this PBC considers improvements to the following areas of the *Road to Zero* SIP:

- **Portfolio, Programme, Project Management Approach:** this approach is a management maturity model that looks at the whole system and not just at the processes
- **Portfolio Governance:** streamline the current governance approach and decision making to support the scale and pace of programme delivery required to meet the *Road to Zero* outcomes
- **Communication and Engagement:** Develop an engagement and communications package to raise awareness of the wider *Road to Zero* approach and why it is needed
- **Local Road Partnerships:** It is important that Waka Kotahi listens to the needs of local authorities and recognises that they each have different needs for assistance. The SIP team's role is to support councils in co-design of programmes with technical and programme level support, testing for safe system alignment through to delivery.
- **Investment Approvals:** Packaging applications will help to save time and improve efficiency, whilst maintaining transparency and independent accountability.
- **Risks, Constraints and Dependencies**

Next Steps

Following Waka Kotahi Board approval, packages of projects within the SIP Delivery Programme 2021-24 will be further developed and funding will be sought to progress and implement each package of safety improvements on the state highway and local road network.

The key objective is to secure programme funding for the SIP Delivery Programme 2021-24, and to confirm that this funding is available from the start of the 2021-24 NLTP period (1 July 2021).

Introduction

This Programme Business Case (PBC) outlines the case for investment in the Waka Kotahi NZ Transport Agency (Waka Kotahi) Speed and Infrastructure Programme (SIP) to help progress New Zealand's road safety strategy – *Road to Zero 2030*.

The safety of a road's design and the speed that vehicles travel on it influence both the risk of a crash and the survival rate. By improving the safety of New Zealand roads, streets, and footpaths, and setting and maintaining safe and appropriate travel speeds, lives can be saved, and injuries can be prevented.

Long stretches of New Zealand's road network consists of narrow, unseparated two-way roads lined with roadside hazards such as fences, ditches, and trees. In towns and cities, high volumes of people walk, bike, and use mobility scooters and wheelchairs, travelling alongside fast-moving vehicles with no separation.

The SIP recognises the importance of tackling infrastructure and travel speeds together. Roads and streets can be engineered up to support existing or higher travel speeds, or speeds lowered to reflect the context and risk of streets and surrounding environments. It is estimated that the Speed and Infrastructure Programme (SIP) will contribute around half of all the Death and Serious Injury (DSI) savings required to meet the *Road to Zero* Strategy target of a 40 percent reduction in DSIs by 2030.

The recommendations of this PBC is for the Waka Kotahi Board to:

- **Endorse** the *Road to Zero* Speed and Infrastructure Programme Business Case 2021-2030 and approve the next steps to implementation.
- **Endorse** the recommended Speed and Infrastructure Programme 2021-2030 for local roads and state highways which will contribute to the overall *Road to Zero* target of 40 percent reduction in deaths and serious injuries at a cost of \$4.96 billion with a benefit cost ratio of 2.1 to 2.3 and deliver:
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- **Note** that the recommended Speed and Infrastructure Programme 2021-2030 will deliver 535 DSI savings which is short of the target 635. The programme has been developed in response to the strategic modelling and incorporates extensive consultation with local representatives and Road Controlling Authorities to “ground-truth” and present a deliverable programme. All efforts will be made to further develop the programme and pursue opportunities to achieve the necessary outcome / target or better as implementation progresses.
- **Allocate** \$1.1 billion funding for the first three years of the Speed and Infrastructure Programme, subject to the outcome of the 2021-24 National Land Transport Fund decision in coming months.
- **Note** that whilst the proposed funding levels in the Waka Kotahi Investment Proposal 2021-31 support the ten-year Speed and Infrastructure Programme, there is a shortfall in the draft funding allocation for the first three years of the programme which could impact on delivery of the programme and achievement of the *Road to Zero* targets by 2030.

This PBC builds on the current 2018-21 Safe Network Programme (SNP)⁴ and seeks Waka Kotahi Board support for changes to the management and implementation of the 2021-24 SIP based on lessons learnt over the current National Land Transport Programme period. These changes are required to enable Waka Kotahi and local authority partners to deliver at the scale and pace required to achieve the desired *Road to Zero* outcomes and implement road safety improvements across the roading network.

This SIP PBC will be supported by further business cases and investment proposals to set out the key interventions that Waka Kotahi and partners will deliver to support progress within each of the five focus areas⁵.

Key Success Factors

The ability of Waka Kotahi to deliver the level of DSI reductions outlined in *Road to Zero* - approximately half of the 40 percent DSI reduction target from the SIP - within activity class limits, is dependent on a number of key considerations outlined below.

Funding Certainty

Approval of the SIP Strategic Implementation Programme (2021-2030) is critical to provide funding certainty to reflect the intent of the government to reduce harm to New Zealand communities and to drive delivery momentum. A funded and approved programme will enable Waka Kotahi and local authority partners to build towards the level of investment required across the ten-year programme to achieve the desired *Road to Zero* outcomes.

Alongside funding certainty, there is a need to accelerate Waka Kotahi approval processes at an individual project and programme level. This will help provide certainty to the wider sector in terms of the scale of the forward work programme. This PBC recommends that a packaged approach to SSI applications is used, and efficiencies gained through the delegated authorities to receive investment information at Steering Group meetings, rather than also then going to the Delegations Committee in addition. This would reduce the time for applications to go through the approval process whilst keeping Waka Kotahi business rules in place. The management case details this approach.

Sector Capacity

To reach the ten-year *Road to Zero* investment levels will require the SIP to build momentum towards a large NLTP 2 and 3 delivery programme: assuming a lower activity class level for *Road to Zero* in NLTP 1. This will likely stretch the current capacity of the sector (approximately \$300 million to \$350 million per annum). It is recognised that funding certainty over the ten-year period would likely provide sufficient time and certainty for the sector to increase resource capability/capacity and increase the attractiveness of this type/scale of work.

Resourced Relationship Management Approach in Partnership with Local Authorities

The local authority programme is a significant contributor to the DSI outcome. The level of support that Waka Kotahi needs to provide local authority partners to plan, develop, design, and deliver the local road programme is high, in particular:

- The approach suggested by safe system is different from traditional practice
- COVID-19 has severely affected the revenue available for the local road programme
- The capacity and capability of local authorities is not consistent across the country.

⁴ The SNP aims to achieve 151 fewer deaths (227 remaining) and 1,120 fewer serious injuries (1,680) by the year 2030, a 40 percent reduction on current projected deaths and serious injuries. Modelling suggests that a business as usual approach will only reduce deaths and serious injuries by about 10 percent by 2030.

⁵ Five focus areas: Infrastructure improvements and speed management (this PBC); Vehicle safety; Work-related road safety; Road user choices; System management.

Integrated Speed and Infrastructure Programme

The SIP recognises the importance of addressing infrastructure and travel speeds together. To enable an integrated approach, it is key that the planning and development of the three-year NLTP programmes are developed and approved early. This enables planning, design and public consultation and engagement activities to be undertaken in the preceding NLTP period, enabling construction to be distributed over the full three-year NLTP period. The SIP is delivered as a continuous programme with planning and development of projects undertaken at the same time as delivery of other projects. It is also important to note that the implementation of individual safety projects can span several NLTP periods.

It is important that the programme composition within each NLTP period enables the implementation of a range of interventions to be delivered in a timely manner. The 2021-24 implementation programme has been prioritised based on available activity class funding for NLTP 1. It consists of a range of interventions including large scale transformational projects.

Alternative Approach

Overall, whilst the proposed funding levels in the draft 2021-24 Waka Kotahi Investment Proposal support the ten-year Speed and Infrastructure Programme, current indications are that funding for the first three years will fall short of required funding levels. This will have a significant impact on the ability of the Speed and Infrastructure Programme to contribute towards the 40 percent DSI reduction outcome with current estimates indicating that this could be reduced to 30 percent.

The programme would need to ramp up in the subsequent NLTP periods, however, this does create greater risk in achieving delivery by the 2030 target date as well as losing the opportunity for early wins.

This PBC has been developed based on available activity class funding for NLTP 1. It is recognised that additional investment in NLTP 1 would greatly reduce the risk of under delivery, as the delivery risk is spread over time, there is also a lost opportunity to save more DSI's in the early years of the programme.

Without additional investment in NLTP 1, increased funding over and above that currently identified in the Waka Kotahi Investment Proposal will be needed in NLTP 2 and 3 to meet the SIP output and outcome expectations as identified in the *Road to Zero* Strategy.

All efforts will be made to further develop the programme and pursue opportunities to achieve the necessary outcome / target or better as implementation progresses, through for instance, prioritising Primary Safe System physical interventions such as median barriers and roundabouts as well as developing innovative design and implementation approaches that enable more efficient progress.

Document Structure

The remainder of this document is structured as follows:

Section One - provides the strategic context for investment in road safety in New Zealand and documents the problems, benefits and investment objectives related to the five focus areas identified in *Road to Zero*.

Section Two - sets out the case for investment in the SIP. It summarises the specific problems, benefits and investment objectives related to this focus area.

Section Three - details the work that has been undertaken to develop the *Road to Zero* DSI target and the expected contributions of each focus area.

Section Four - summarises the recommended ten-year strategic SIP for state highways and local roads and details the SIP Delivery Programme (2021-24 NLTP period).

Section Five - documents the Financial, Commercial and Management Cases and details how the SIP will be administered by Waka Kotahi. The Management Case identifies improvements to the way in which SIP projects are packaged, assessed, and implemented by Waka Kotahi and Road Controlling Authorities.

Partners and Key Stakeholders

This PBC has been developed by Waka Kotahi at the same time as several parallel processes such as the development of the 2021-2024 Speed and Infrastructure Programme. The recommended SIP has been co-designed with partners, including programme development and consultation and engagement with Road Controlling Authorities (RCA’s) and road user representative organisations.

Stakeholders from a range of organisations have an interest in the expected outcomes from this SIP PBC or can influence the investment proposal and the *Road to Zero* outcomes. These are listed in Table 1.

Table 1 Key Stakeholders

Stakeholders	Focus Areas
Road Controlling Authorities	Road controlling authorities are responsible for operating and co-investing alongside Waka Kotahi in the local road network, including safety improvements
NZ Police	The NZ Police are responsible for enforcing the law, including speed limits
Ministry of Transport	The MOT is responsible for advising the government on transport policy
Road User Representative Organisations	This includes the Automobile Association (AA), the Road Transport Forum, Cycling Action Network, Living Streets Aotearoa, Safe and Sustainable Transport Association and the Motorcycle Safety Advisory Council who are responsible for promoting the interests of the road transport industry and road users

Section one: *Road to Zero*

This section provides the strategic context for investment in road safety in New Zealand and documents the problems, benefits and investment objectives related to the focus areas identified in *Road to Zero*.

Alignment to existing strategies

Government Policy Statement (GPS)

The Government Policy Statement on Land Transport (GPS) sets out the government's priorities for expenditure from the National Land Transport Fund (NLTF) over the next ten years. It sets out how funding is allocated between activities such as road safety policing, state highway improvements, local and regional roads, and public transport⁶. The GPS is reviewed and updated every three years. The Government Policy Statement on Land Transport (GPS 2021)⁷ has been published. From July 2021, the GPS 2021 will take effect and replace the current GPS 2018, though building and consolidating on the GPS 2018 priorities.

The GPS 2021 provides the government's direction and guidance to those who are planning, assessing, and making decisions on investment from the NLTF. It sets out the government's strategic priorities and commitments for land transport investment considering a range of policies and strategies including *Road to Zero 2030*. Safety is identified as one of the government's four strategic priorities in the GPS 2021, as shown in Figure 2. Regarding the safety priority, the GPS 2021 states that:

"We need to create a transport system in both urban and regional areas that protects people. This priority gives effect to, but is not limited to, the Road to Zero: the 2020-2030 road safety strategy (Road to Zero)."

"The primary focus of this priority is to develop a transport system that advances New Zealand's vision that no-one is killed or seriously injured while travelling. New Zealand roads will be made substantially safer."

The objectives of this PBC align to the GPS 2021 through the focus on safety and reducing harm on New Zealand roads. The objectives also contribute to the GPS priorities of inclusive access, economic prosperity and resilience and security.

Implementing the *Road to Zero (2020-2030) Strategy* and the initial Action Plan (2020-2022) are identified as government commitments within the GPS 2021 with an initial expectation of \$10 billion of investment to support these commitments. As a further step to support this, the GPS 2021 has included a new *Road to Zero* activity class for investment targeted towards those interventions identified as being key to achieving the target of a 40 percent reduction in DSI's by 2030. This target was informed by an Integrated Intervention Logic Model (IILM) as detailed further in Section 3 of this PBC⁸.

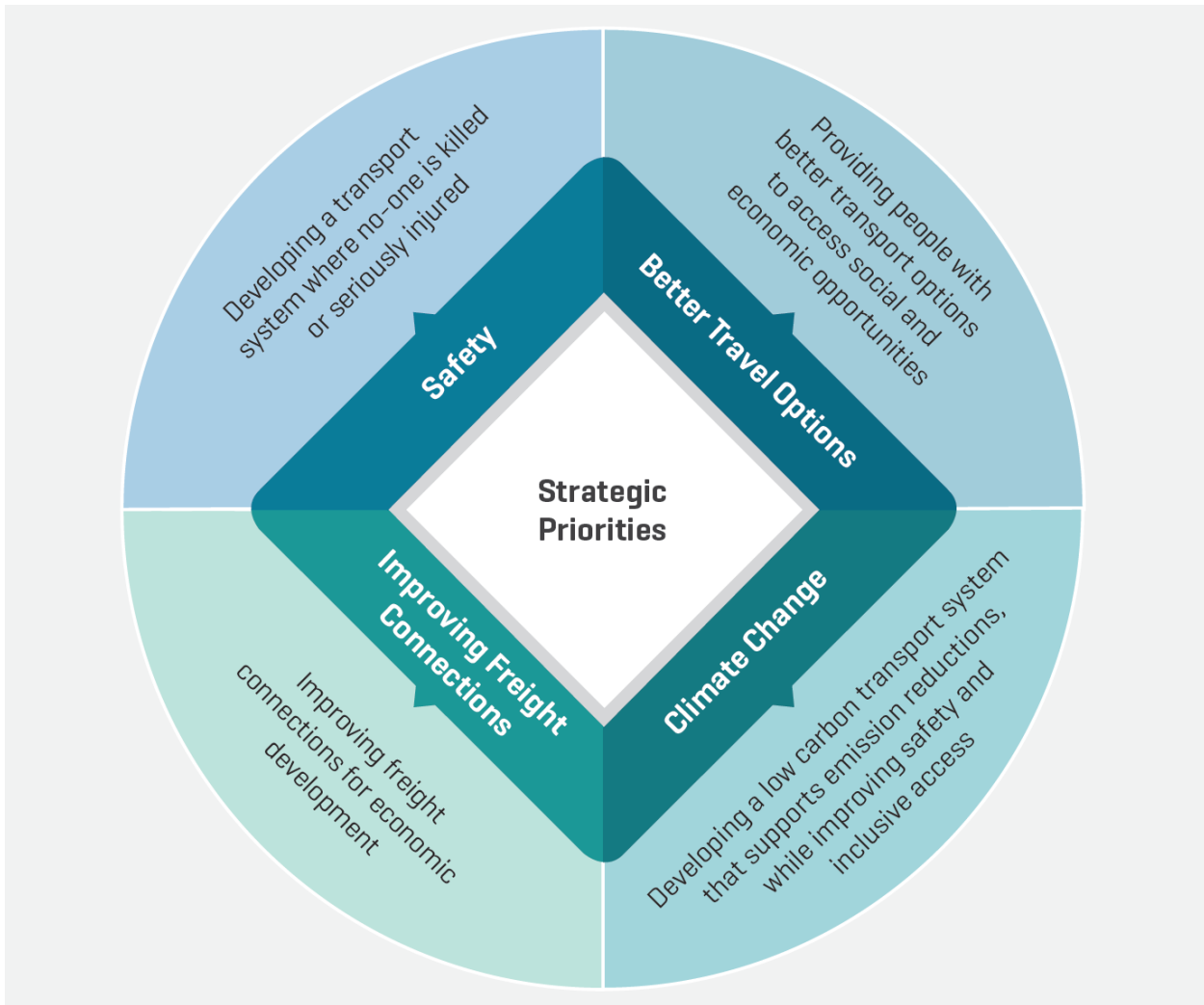
The 40 percent reduction in DSI's by 2030 is based on 3,178 DSI's recorded in 2018. Steady progress towards the target would mean approximately 750 fewer deaths and 5,600 fewer serious injuries over the next ten years.

⁶ <https://www.transport.govt.nz/multi-modal/keystrategiesandplans/gpsonlandtransportfunding/>

⁷ <https://www.transport.govt.nz/multi-modal/keystrategiesandplans/gpsonlandtransportfunding/gps-2021/>

⁸ The Integrated Intervention Logic Model - The IILM is used to calculate potential savings in DSIs through a combination of interventions, working in tandem, across all parts of the transport system. The IILM is described in more detail in **Section 3**.

Figure 2 Strategic Direction of the GPS 2021



Transport Outcomes Framework

The Transport Outcomes Framework outlines what the government is hoping to achieve through the transport system. *Road to Zero* is a whole-of-sector strategy that contributes to the aspirations of the government's Transport Outcomes Framework⁹, with strong alignment to the objectives of the Healthy and Safe People outcome.

Healthy and Safe People is one of five core outcomes that the government is seeking to achieve through the transport system, by helping to protect people from transport-related injuries and harmful pollution and by making active travel an attractive option. The transport system can either benefit or harm people's health, depending on how it is designed, developed, and used. The Transport Outcomes Framework shown in Figure 3 acknowledges that New Zealand's transport system needs to be safer in the future, particularly land transport.

⁹ <https://www.transport.govt.nz/multi-modal/keystrategiesandplans/transport-outcomes-framework/>

Figure 3 Transport Outcomes Framework



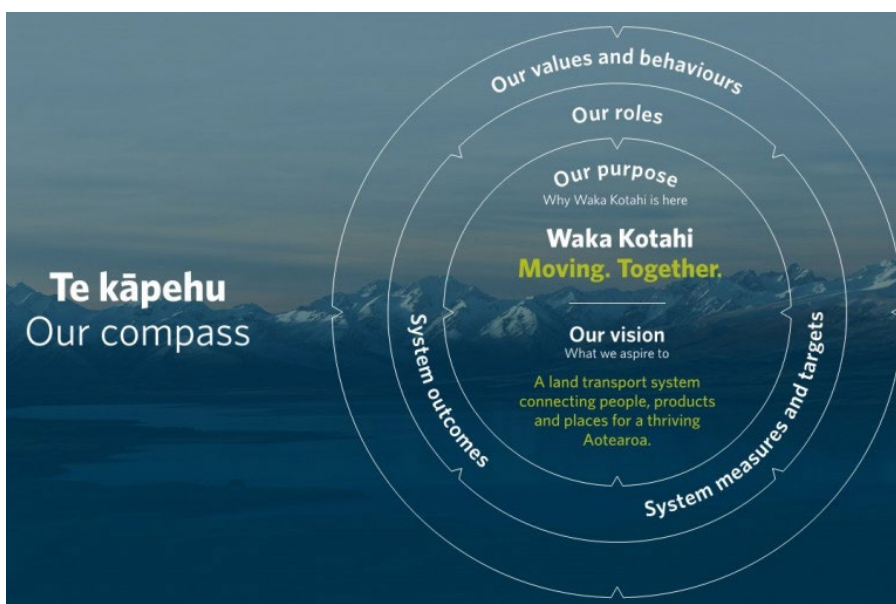
Waka Kotahi: Te Kāpehu | Our Compass

Te kāpehu whetū, the Māori star compass, is the analogy used by Waka Kotahi's for their strategic direction, values, and behaviours. Te kāpehu | Our compass provides direction by defining:

- High-level aspiration (our vision)
- Why Waka Kotahi exists (our purpose)
- What Waka Kotahi does (our roles)
- The system-level changes Waka Kotahi are striving to achieve (system outcomes)
- How Waka Kotahi acts and engages with others (values and behaviours)

These aspects of Te kāpehu are shown in Figure 4.

Figure 4 Te kāpehu | Our compass



Our vision

Our vision describes the land transport system that Waka Kotahi aspires to and are committed to delivering through the things they lead, shape and influence. The Waka Kotahi vision is: *A land transport system connecting people, products and places for a thriving Aotearoa.*

Our vision describes a system that connects individuals, businesses and communities to each other to provide access to important social and economic opportunities such as work, school, shops, churches, marae, healthcare providers, and parks.

Our purpose

Our purpose sets out the why – the reason Waka Kotahi exists and their unique value proposition. Waka Kotahi's purpose is: *Waka Kotahi | Moving. Together.*

The name Waka Kotahi conveys the concept of moving together as one and inspires their new purpose. It also embraces concepts of integration, affordability, safety, and responsiveness.

Our roles

Our roles are the four big things that Waka Kotahi must do to achieve their vision. They are system focused and are not specific to any group within Waka Kotahi – all groups, teams and people collectively deliver across the matrix of roles. Our roles are:

- Kia hoe ngātahi | Move together as one - We lead with others to achieve valuable transport outcomes
- Te anamata | Leave great legacies - We shape and invest in a sustainable transport system for everyone
- Kia tika te mahi | Deliver the right things - We partner and invest to maintain, operate and improve the land transport system
- Kia marutau | Enable a safe system - We reduce harm to people and the environment

Values and behaviours

Our values and behaviours shape Waka Kotahi's culture and guide the way they work together. They define what is important to Waka Kotahi and help them to deliver their best work every day. Our values and behaviours influence how people work within Waka Kotahi and how they engage with iwi, partners, stakeholders and communities.

The values and behaviours will become part of what it means to be an employee of Waka Kotahi. Waka Kotahi's mātaōpono (values) are bilingual in English and te reo Māori. They are not direct translations but are closely related concepts so each mātaōpono has its own meaning.

- Ngākau aroha | Have heart – Waka Kotahi has the wellbeing of their people, community and planet at the heart of everything we do. Waka Kotahi:
 - contributes to a safe and sustainable environment
 - shows respect for all people
 - treats others how they would like to be treated
 - are inclusive and connected
 - looks out for each other.
- Kotahitanga | Better together – Waka Kotahi achieves great things when they work together to build trusted relationships inside and outside of Waka Kotahi. Waka Kotahi:
 - builds better relationships

- joins up our thinking and our doing
- removes barriers to collaboration
- seeks and listens to the perspectives of others to learn and grow
- invites conversation and feedback to always improve.
- Kia māia | Be brave – Waka Kotahi’s outcomes are better when they bring courage and self-belief to their passion and purpose. Waka Kotahi:
 - speak up when it matters
 - challenge to achieve the right outcome
 - make and own the tough decisions
 - find different perspectives to challenge thinking
 - face up to the difficult issues.
- Mahia | Nail it – Waka Kotahi creates an enduring legacy, delivering their best work every day. Waka Kotahi:
 - are clear on what is important
 - deliver the right outcomes
 - hold ourselves to account
 - help others succeed
 - celebrate success.

The purpose, vision, roles, system outcomes, system measures and targets, values and behaviours are shown in Figure 5. This strategic direction highlights the importance of working together effectively within Waka Kotahi to deliver successful outcomes, including improving safety outcomes.

Figure 5 Te kāpehu strategic direction



Te kāpehu
Our compass

Our purpose

Why Waka Kotahi is here

Waka Kotahi | Moving. Together.

Our vision

What we aspire to

A land transport system connecting people, products and places for a thriving Aotearoa.

Our roles

What we do

Kia hoe ngātahi

Move together as one

We lead with others to achieve valuable transport outcomes.

Te anamata

Leave great legacies

We shape and invest in a sustainable transport system for everyone.

Kia tika te mahi

Deliver the right things

We partner and invest to maintain, operate and improve the land transport system.

Kia marutau

Enable a safe system

We reduce harm to people and the environment.

System outcomes

The difference we want to make

Aotearoa has a transport system that is:

- Safe.
- Meeting current and future needs.
- Environmentally sustainable.
- Effectively and efficiently moving people and freight.

System measures and targets

The change we want to see

- Reduce deaths and serious injuries.
- Sustainable funding to deliver.
- Reduce carbon emissions.
- Reliable and multi-modal travel for people and freight.

Our values

Guide our actions

Ngākau aroha

Have heart

We have the wellbeing of our people, community and planet at the heart of everything we do.

Kotahitanga

Better together

We achieve great things when we work together to build trusted relationships inside and outside of Waka Kotahi.

Kia māia

Be brave

Our outcomes are better when we bring courage and self-belief to our passion and purpose.

Mahia

Nail it

We create an enduring legacy, delivering our best work every day.

Our behaviours

How we act

As Waka Kotahi we:

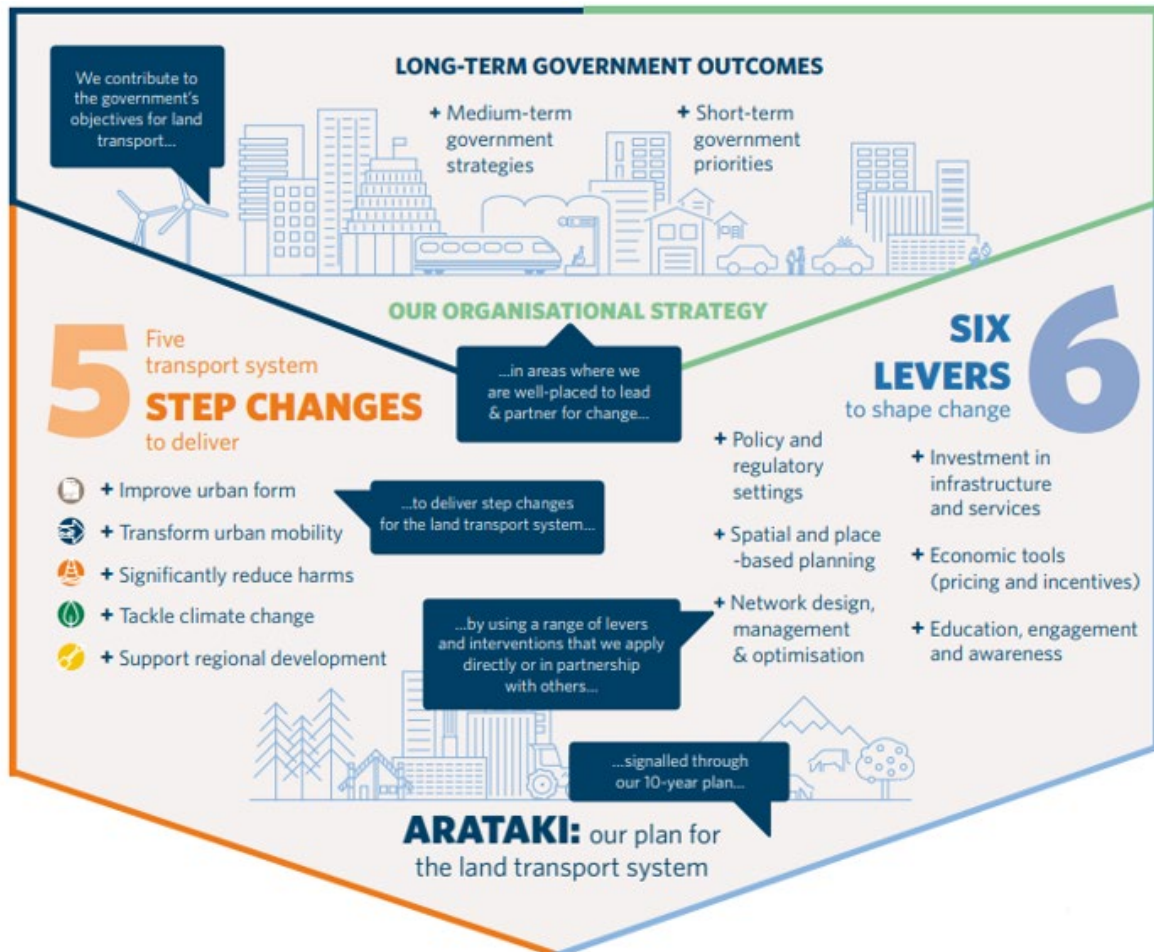
- contribute to a safe and sustainable environment
- show respect for all people
- treat others how they would like to be treated
- are inclusive and connected
- look out for each other.
- build better relationships
- join up our thinking and our doing
- remove barriers to collaboration
- seek and listen to the perspectives of others to learn and grow
- invite conversation and feedback to always improve.
- speak up when it matters
- challenge to achieve the right outcome
- make and own the tough decisions
- find different perspectives to challenge thinking
- face up to the difficult issues.
- are clear on what is important
- deliver the right outcomes
- hold ourselves to account
- help others succeed
- celebrate success.

Arataki

Arataki is the ten-year Waka Kotahi view of what is needed to deliver on the government’s current priorities and long-term objectives for the land transport system. Version 2 of Arataki has been updated to identify the post-Covid-19 challenges and opportunities over the next ten years.

Arataki is made up of place-based summaries (one national, three pan-regional and 14 regional) that tell a land transport system story. These are framed by five step changes where Waka Kotahi see there is a need for change. These step changes include the need to significantly reduce harm by transitioning to a transport system that reduces DSI’s and improves public health, which is a key focus for this PBC.

Figure 6 Arataki Strategic Approach



New Zealand’s Road Safety Strategy - Road to Zero

The SIP forms a key part of New Zealand’s road safety strategy, *Road to Zero 2030*, which was developed by the Ministry of Transport (MOT) and endorsed by Cabinet in December 2019. The strategy adopts a Vision Zero position:

“Our vision is a New Zealand where no one is killed or seriously injured in road crashes. This means that no death or serious injury while travelling on our roads is acceptable.”

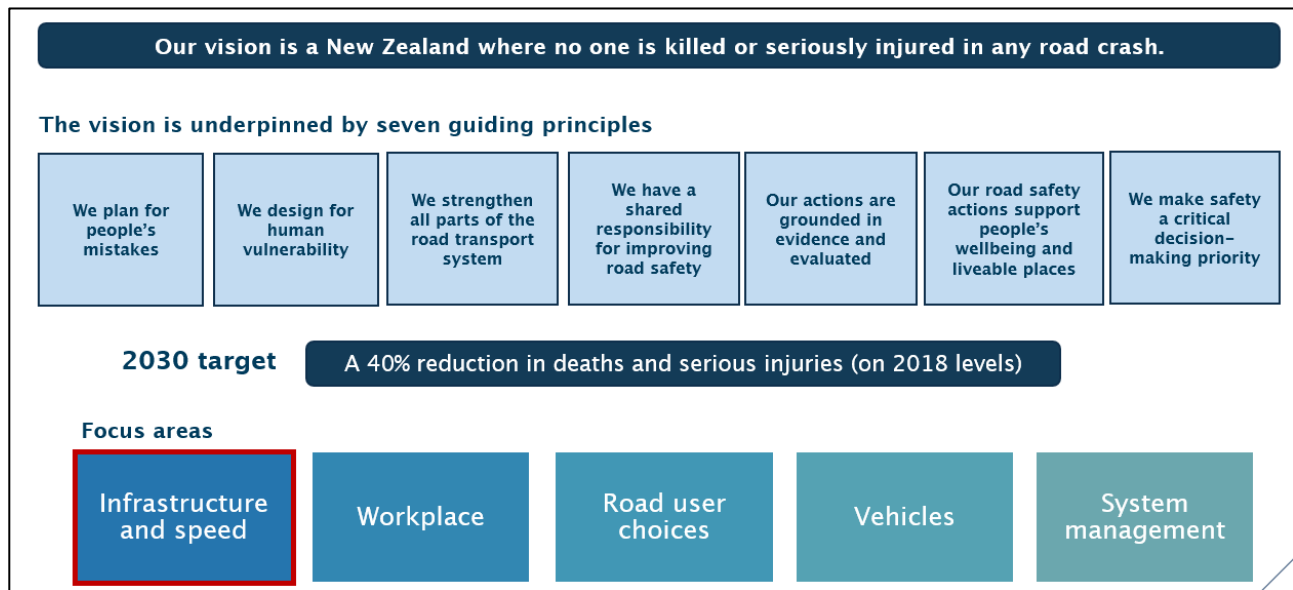
In April 2018, Cabinet provided its agreement to commence the development of a new national road safety strategy to address New Zealand’s poor road safety record^{10,11}. As part of developing the *Road to Zero* Strategy several scenarios were considered, including the development of target DSI reduction options ranging from 30 percent to 60 percent (from a 2018 baseline).

In May 2019, the MOT submitted a briefing to Ministers detailing each of these target options for consideration. Achieving the 40 percent target was selected by Cabinet. In December 2019, the government launched *Road to Zero: New Zealand’s road safety strategy 2020-2030*. The *Road to Zero* Strategy and this PBC are underpinned by seven guiding principles and modelling which identifies the need for a suite of interventions across five focus areas as shown in Figure 7.

¹⁰ <https://www.transport.govt.nz/assets/Uploads/Our-Work/Documents/REDACTED-Improving-Road-Safety-in-New-Zealand-Redacted.pdf>

¹¹ <https://www.beehive.govt.nz/release/no-loss-life-acceptable>

Figure 7 Road to Zero Summary



Adopting the *Road to Zero* vision represents an ambitious commitment to making some transformative changes, such as stronger leadership, committing to safety as a critical priority for investment and decision-making, and a greater focus on system changes rather than on addressing human error alone. It requires clear goals and ongoing monitoring to measure progress.

Waka Kotahi is committed to the internationally proven Safe System approach and the government's vision of achieving a safe road system where no one is killed or seriously injured in road crashes. The Safe System approach recognises that people make mistakes and are vulnerable in a crash. It reduces the price paid for a mistake, so crashes don't result in loss of life or limb. Mistakes are inevitable – deaths and serious injuries from crashes are not. The Safe System approach is guided by four principles, that acknowledge:

1. People make mistakes that lead to road crashes – There is a need to recognise that people make mistakes, and some crashes are inevitable
2. People are vulnerable - Bodies have a limited ability to withstand crash forces without being seriously injured or killed
3. There is a need to share responsibility - Those who design the road system and those who use the roads must all share responsibility for creating a road system where crash forces don't result in death or serious injury
4. There is a need to strengthen all parts of the system – There is a need to improve the safety of all parts of the system - roads and roadsides, speeds, vehicles, and road use - so that if one part fails, other parts will still protect the people involved¹²

Road to Zero Action Plan (2020-2022)

Under the five focus areas there are 15 initial actions, which are set out within the *Road to Zero* Action Plan 2020-2022. This first action plan will last for three years, although delivery of some of the initial actions will continue over the life of the strategy. The five focus areas and 15 actions form the basis of Waka Kotahi's implementation plan.

Road to Zero also includes an outcome framework with a clear result focus to help drive action and hold relevant road safety partners accountable for delivery. The strategy document describes the overarching goal,

¹² *Road to Zero* Strategy 2020-2030, 2019

outcome indicators and safety performance indicators. For each of the focus areas, the *Road to Zero* Action Plan 2020-2022 sets out the specific intervention indicators that are relevant to the initial actions.

The immediate set of actions for 2020-2022 are outlined in Table 2 and mapped to each of the key focus areas.

Table 2 Initial Actions Mapped to Key Focus Areas

Focus Area	Initial Action Plan Areas (2021-2022)
Speed Management and Infrastructure Improvements	01: Invest in safety treatments and infrastructure improvements 02: Introduce a new approach to tackling unsafe speeds 03: Review infrastructure standards and guidelines 04: Enhance safety and accessibility of footpaths, bike lanes and cycleways
Vehicle Safety	05: Raise safety standards for vehicles entering the fleet 06: Increase understanding of vehicle safety 07: Implement mandatory anti-lock braking systems (ABS) for motorcycles
Work-Related Road Safety	08: Strengthen commercial transport regulation 09: Support best practice for work-related road safety
Road User Choices	10: Prioritise road policing 11: Enhance drug driver testing 12: Increase access to driver licensing and training 13: Support motorcycle safety 14: Review road safety penalties
System Management	15: Strengthen national system leadership and coordination of road safety

Work Completed to Date to Deliver *Road to Zero*

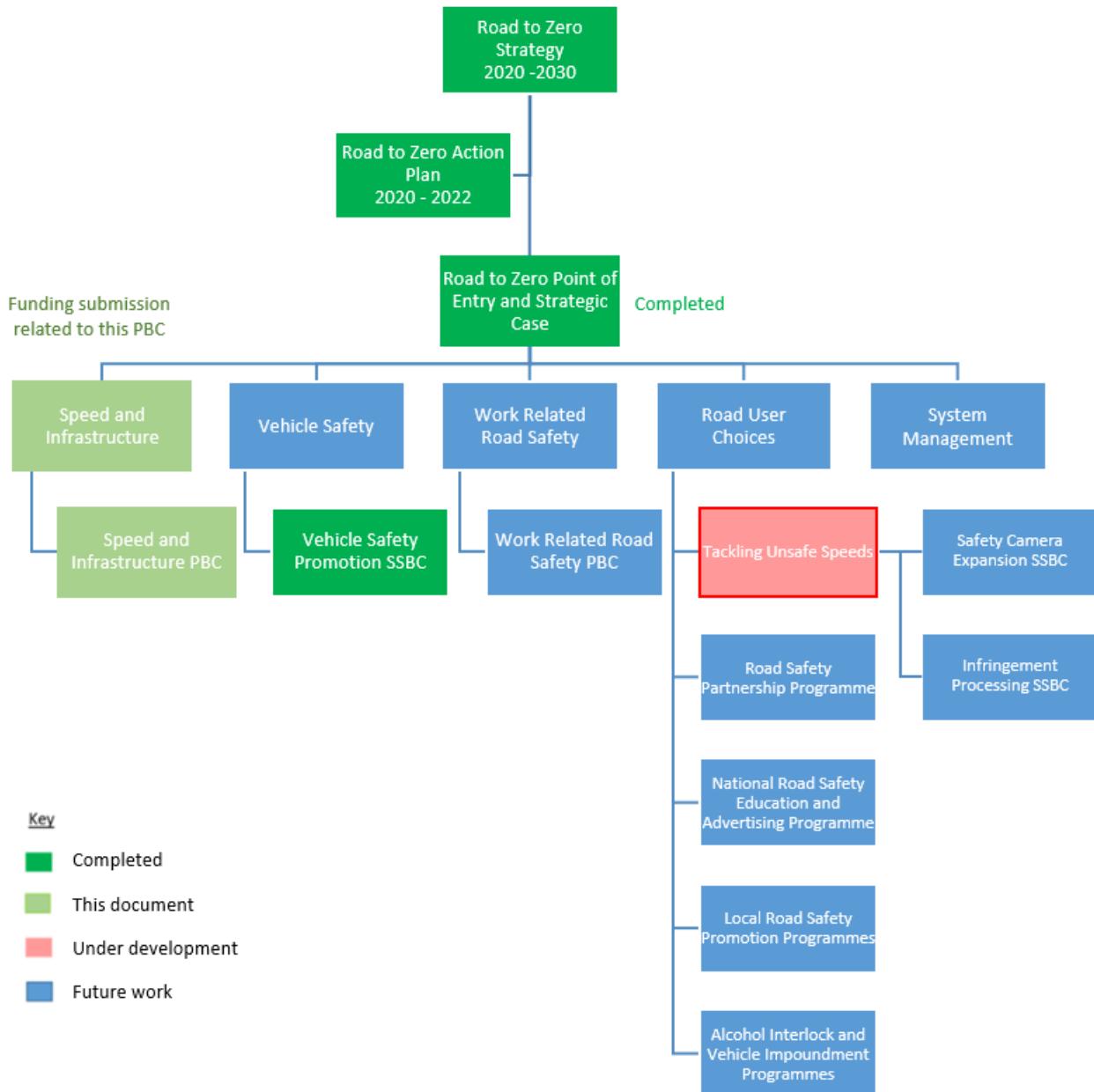
Figure 8 provides an overview of the work that has been completed to date and work that is underway or planned to secure investment and progress each focus area.

A *Road to Zero* Strategic Case was developed in July 2020 and supports the development of a series of business cases and/or investment programmes to address the problems identified in the *Road to Zero* Strategy and achieve the desired reduction in harm to communities.

This PBC seeks approval and funding to deliver the SIP, but also provides the overarching strategic case and context for investment in the other four focus areas. This PBC is intended to be a 'living document' that can be updated to document the case for investment in the other focus areas, as these are progressed.

It is expected that further work will be undertaken to refine the programmes associated with the other four focus areas (Vehicle Safety, Work Related Safety, Road User Choices and System Management). Some of this work is underway, for example a Tackling Unsafe Speed business case and a Vehicle Safety Promotion SSBC has been developed as summarised in Figure 8.

Figure 8 Road to Zero Implementation Overview

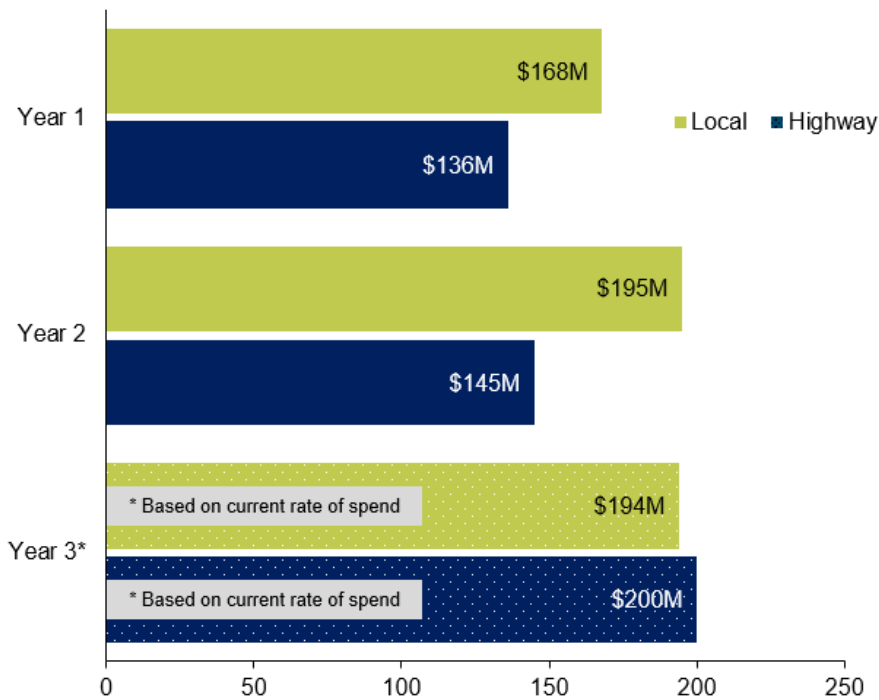


The Current Safe Network Programme (2018-21 NLTP)

In 2018, \$1.05 billion was endorsed by the Waka Kotahi board to implement safety improvements. This included \$532 million for safety improvements on state highways and \$515 million for local roads. A further \$146 million was identified for state highways and \$259 million for local roads in the 2018-21 NLTP, resulting in a total potential programme of \$1.4 billion.

The current programme is forecasting approximately \$1 billion to be spent across state highways and local roads by the end of the current 2018-21 NLTP period as summarised in Figure 9.

Figure 9 Annual Programme Rate of Spend (2018-21 NLTP)



The SNP was developed under the previous government’s Safer Journeys strategy (2010-2020) and is on track to prevent 160 DSI’s each year. This compares to the target reduction of 636 DSI’s year required to meet the 40 percent reduction by 2030 (76 fewer people killed, and 560 fewer people seriously injured per year).

The current SNP targets the country’s highest risk roads, including both state highways and local roads, and has three key components:

- Roads and roadsides improvements
- Speed management
- Level crossing improvements

The DSI reductions achieved to date include the additional length of the network that was treated as part of the Boost programme, which is a \$35 million programme led by Waka Kotahi that seeks to implement a range of low-cost safety improvements. The Boost 1 and 2 programmes are made up of 91 regional state highway projects, that is expected to expect to achieve a DSI reduction of 30¹³.

An overview of the current SNP components and sub programmes is provided below.

State Highway Projects

The SNP delivers safety improvements on the highest risk state highways across New Zealand. Typical characteristics of a state highway project includes higher levels of funding, governance requirements, risk, and in-depth upfront design.

Local Road

A local road project is where safety is identified as a primary focus within a local council network. The Waka Kotahi SIP team assists in the development of each Local Authorities SIP for submission to the relevant Regional Land Transport Plan (RLTP)/NLTP process. Each Local Authority is responsible for design and

¹³ <https://www.nzta.govt.nz/safety/our-vision-of-a-safe-road-system/>

construction of the safety intervention. However, the Waka Kotahi SIP team assist with the design and delivery steps where required.

A new funding model was developed for the 2018-21 NLTP period to enable the rapid delivery of local safety projects. Where appropriate and eligible Waka Kotahi currently subsidise local road safety improvements at a higher rate through a targeted enhanced financial assistance rate (TEFAR). To achieve this, Waka Kotahi has simplified decision-making and approval processes around standard safety treatments. This has helped to streamline delivery for Waka Kotahi and its partners to deliver safety improvements at scale and pace.

The local road programme consists of similar sub-programmes as the state highway programme. However, it is at the discretion of each of the local councils how the programme is managed and delivered.

Sub-programmes

Several sub-programmes are operating within the SNP operating model. The SNP has been designed for flexibility to allow for the various types of projects to be implemented. The current mix of sub-programmes have different characteristics such as funding, governance, and risk, and vary in the amount of effort required to deliver the project within each of the project lifecycle phases.

An overview of the Speed Management and Low Cost, Low Risk sub-programmes is provided below.

Speed Management

To address one of the primary objectives of SNP, a separate pipeline was developed for speed management projects, focussed on the top ten percent GPS High-Benefit Speed Management Opportunities, whilst contributing to the overall outcomes of the programme.

The top ten percent GPS High-Benefit Speed Management Opportunities¹⁴ (identified in Mega Maps) provides a distinction between corridors where speed limit reduction is likely to be the most appropriate measure (Challenging Conversations) and corridors where investment to improve the safety performance of the corridor to a standard where a higher speed limit is likely to be justifiable (Engineer Up).

Speed management projects seek to review, recommend, engage, and consult with external stakeholders on speed reductions. Speed management projects, for the state highway network, utilise a 'panel' for technical review of proposed speed changes and have specific processes around consultation and publishing speed changes to the public.

A small change in speed makes a big difference, especially when cyclists or pedestrians are involved. Most crashes are caused by several contributing factors, but even when speed doesn't cause the crash, it is most likely to determine whether anyone is killed, injured, or walks away unharmed.

Low Cost, Low Risk (LCLR)

Low-Cost Low-Risk (LCLR) projects are typically smaller projects that require a low level of funding (up to \$1 million¹⁵) and have low levels of risk. Waka Kotahi has amended and simplified the definition of a Low-Cost Low-Risk activity for the 2021-24 NLTP as:

'Any activity within an identified activity class that has a total implementation cost within the Low-Cost Low-Risk threshold'

The SNP anticipates that a significant number of projects will be delivered under LCLR. Within this project type, there are also various sub-categories such as Level Crossings and Boost. The Safety Boost Programme makes regional state highways safer through a range of low-cost safety improvements.

¹⁴ Investment in state highways and local roads to accelerate the implementation of the new Speed management guide, focusing on treating the top 10 per cent of the network which will result in the greatest reduction of death and serious injury as quickly as possible.

¹⁵ The threshold for Low Cost-Low Risk will increase to \$2 million in 2021-24 NLTP

The Level Crossing sub-category consist of safety improvements for train level crossings on state highways. A total of \$26 million is being spent in the current 2018-21 NLTP period to make crossings safer for drivers and pedestrians by using low-cost improvements to prevent deaths and serious injuries, targeting crossings on or near state highways.



Road to Zero strategic case

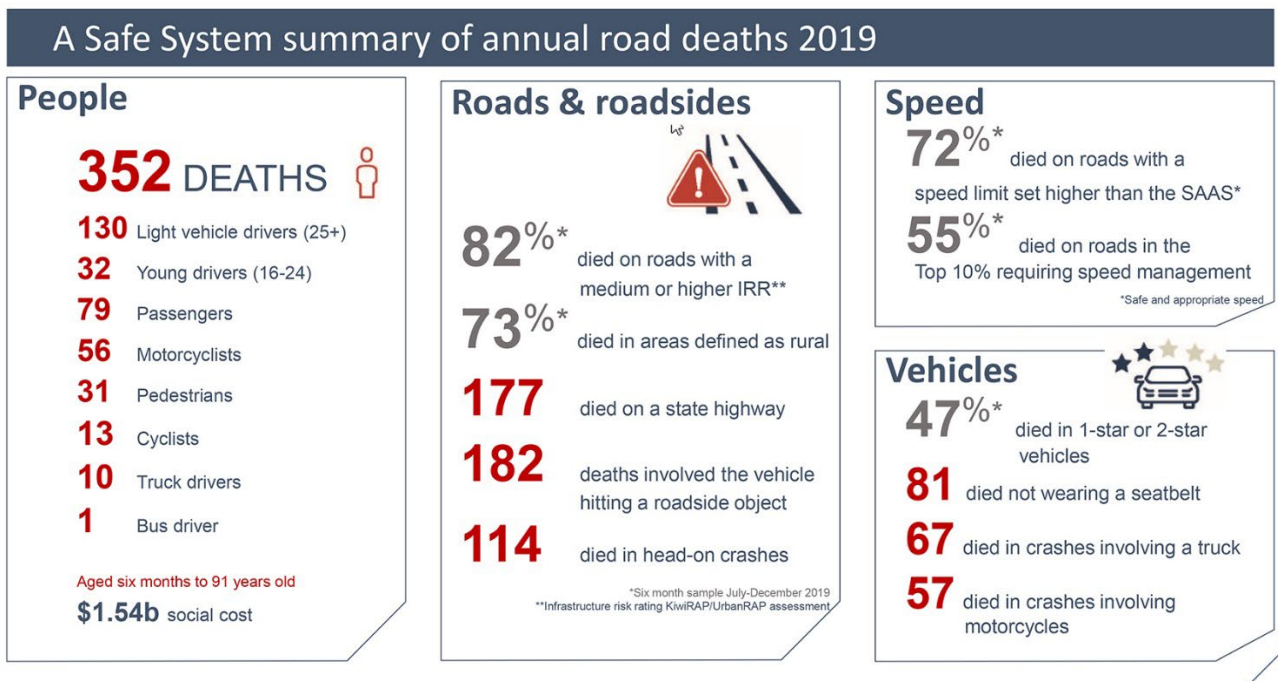
This section sets out the strategic case for the **whole of Road to Zero**, including an assessment of the problems, benefits, and investment objectives for each focus area. It does not include the SIP focus area which is summarised in detail in the next section of this PBC.

National Road Safety Problem

This section begins by providing an overview of the national safety problem as documented in the *Road to Zero Strategy*. New Zealand currently ranks in the bottom quarter of the Organisation for Economic Cooperation and Development (OECD) member countries for road safety. A summary of annual road deaths recorded in 2019 is provided in Figure 10. In 2019, 352 people were killed on New Zealand roads, and thousands more seriously injured. DSI's should not be an inevitable cost of travelling on New Zealand roads.

Figure 10 demonstrates the need for improvement in the areas of speed and infrastructure, as well as vehicle safety and road user choices to achieve reduced harm.

Figure 10 Road Safety Outcomes 2019



Over the past six years there has been an unprecedented rise in the number of deaths and serious injuries as shown in Figure 11 and Figure 12. There is a correlation between the number of DSI's and the increased number of people travelling on New Zealand roads. When the crash counts per year are normalised to consider traffic volumes, an increase in the crash rate is still visible. The increase in crash rates is not solely due to the increased traffic volume but is most likely influenced by wider factors¹⁶.

¹⁶ Understanding the safety impacts and opportunities of state highway resurfacing and renewals, January 2020

Figure 11 Crash Rate and Number of Crashes Over Time (All Crashes)

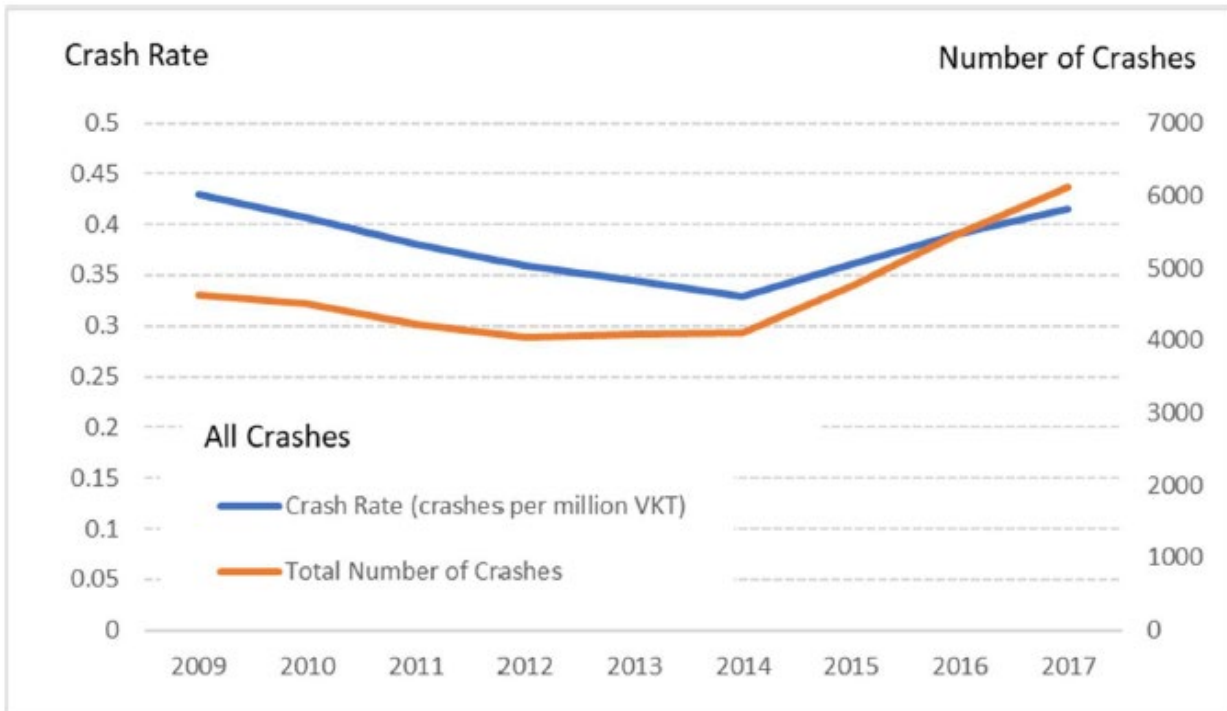
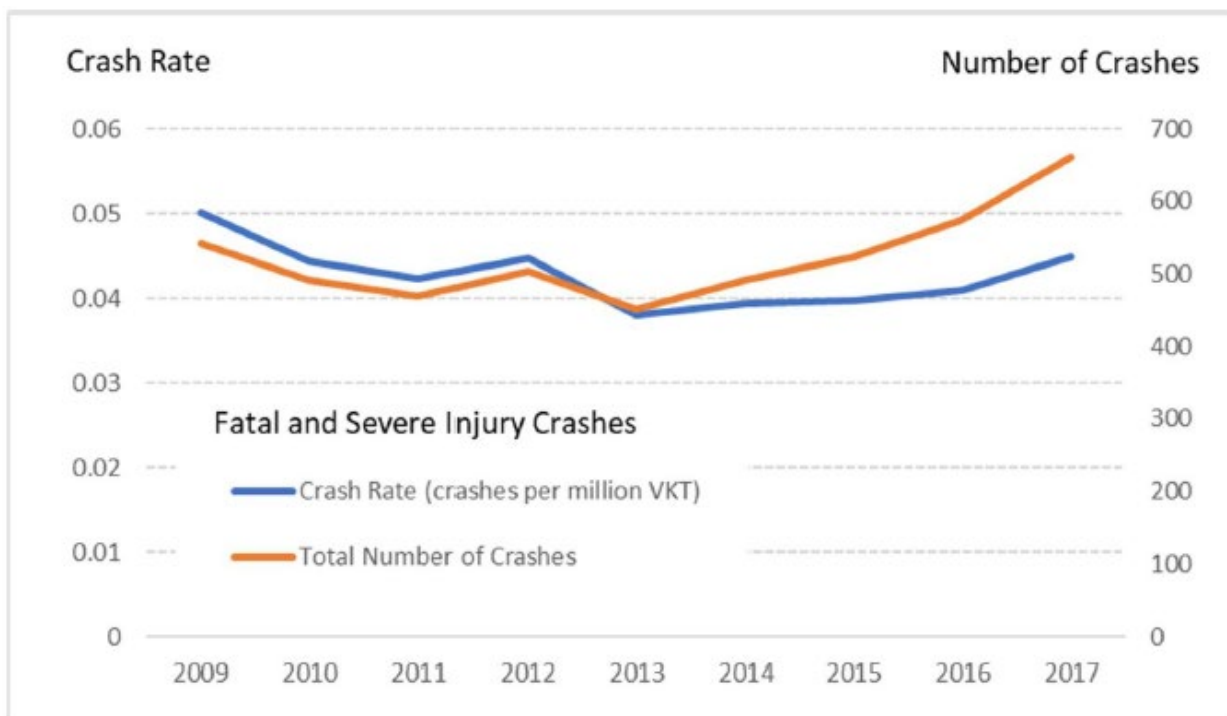


Figure 12 Crash Rate and Number of Crashes Over Time (Fatal and Serious Crashes)



A summary of all DSIs on the state highway and local road networks between 2014 and 2018 is provided in Table 3. Whilst the state highway network is a relatively small proportion of the roading network, as summarised in Table 3 it carries a significant volume of traffic indicating that the level of exposure and risk is much greater on the state highway network compared to the local road network.

This in turn suggests that the level of investment is likely to be higher on state highways to respond to that increased risk. However, the distribution of DSIs also indicates that whilst just over half the death occur on state highways, 64 percent of serious injuries occur on local roads thereby confirming the need for investment on local roads too.

Table 3 Deaths and Serious Injuries (DSIs) Across the New Zealand Network (2014-2018)

Factor	State Highway	Local Road	New Zealand Total
Length of Network	11,000 km (12%)	83,000 km (88%)	94,000 km
Vehicle Kilometres Travelled (VKT)	23,543 million VKT (51%)	23,010 million VKT (49%)	46,554 million VKT
Deaths	51%	49%	100%
Serious Injuries	36%	64%	100%
DSIs	38%	62%	100%
Urban and Rural DSIs	16% urban 84% rural	63% urban 37% rural	45% urban 55% rural
Intersections and Midblock DSIs	21% at intersections 79% midblock	34% at intersections 66% midblock	29% at intersections 71% midblock
Active Road Users (e.g. pedestrians and cyclists) and Motorcyclists DSIs	7% active road users 16% motorcyclists	23% active road users 21% motorcyclists	19% active road users 17% motorcyclists
DSIs by crash type: Rural Head On, Run off road, Intersection, Other	31% Rural head-on 40% Run off road 13% at intersection 16% Other	16% Rural head-on 59% Run off road 14% Intersection 11% Other	25% Rural head-on 48% Run off road 13% Intersection 14% Other

Understanding the Strategic Case for Each *Road to Zero* Focus Areas

This section documents the problems, benefits and investment objectives related to four of the five focus areas identified in *Road to Zero*:

- Vehicle Safety
- Work Related Road Safety
- Road User Choices
- System Management

An overview of the problems and evidence associated with the SIP is provided in the next section of this PBC.

Vehicle Safety

Safe vehicles not only help drivers avoid crashes, but also protect occupants and other road users when crashes do happen. Vehicles with higher safety performance include safety features such as cabin structural integrity, crumple zones, airbags and seatbelts that are designed to absorb the impacts of a crash and protect people from serious trauma¹².

Figure 13 Vehicle Safety Evidence Snapshot (from Road to Zero Strategy)

You're at least **90 PERCENT MORE LIKELY TO DIE** or be seriously injured in a crash **IN A ONE-STAR SAFETY-RATED CAR** than in a five-star safety-rated car.

1 IN 5 VEHICLES imported in 2016 had **A ONE OR TWO STAR SAFETY RATING**.

You're **21 TIMES MORE LIKELY OF BEING KILLED OR INJURED IN A ROAD CRASH ON A MOTORCYCLE** than in a car over the same distance.

Approximately **20 PERCENT OF DEATHS** on our roads every year **INVOLVE A HEAVY VEHICLE**.



A car with a **FIVE-STAR SAFETY RATING** or crashworthiness rating offers the **SAFEST LEVEL OF PROTECTION** for its occupants while a **ONE-STAR CAR OFFERS THE LEAST**.

Vehicles with a **ONE AND TWO STAR** crashworthiness rating make up **45% OF THE FLEET**, BUT **66% OF DEATHS AND SERIOUS INJURIES** on our roads occur in these vehicles.

Young drivers are more likely to be driving less safe cars. **81% OF DEATHS AND SERIOUS INJURIES FOR YOUNG PEOPLE OCCUR IN ONE AND TWO STAR CARS.**

Rapid advances in technology mean vehicles are getting safer, and we have the data to support good consumer choices. Yet, many New Zealanders don't know about the role their car's safety plays in their chances of having or surviving a crash¹².

The current vehicle fleet does have a range of safety features such as anti-lock braking systems (ABS), airbags, and electronic stability control. Increasingly, vehicles are being built with more active safety features that help the driver avoid a crash occurring in the first place. These safety features include lane-keep assistance, collision warning systems and autonomous emergency braking. For motorcycles, anti-lock braking systems (ABS) are proven to reduce out-of-control crashes. While most new vehicles coming into New Zealand have good safety features, not all do – and more expensive cars aren't necessarily safer either. New Zealand also imports many used vehicles that vary greatly in their safety performance. Most of these vehicles will stay on the roads for well over a decade before they are finally scrapped.

Without intervention it could take a long time for the rapid improvements in vehicle safety technologies and features to be available to most New Zealanders.

During the development of *Road to Zero* there was strong support from stakeholders for government to take the lead through regulation to improve the safety of the fleet, and for this to be supported by initiatives aimed at building greater consumer demand for safe vehicles. Key players in the vehicle sector (including insurers, manufacturers, and vehicle testing and inspection providers) have indicated their desire and willingness to help. Their support is critical for making significant gains in this area¹².

A focus within *Road to Zero* is on increasing minimum standards for vehicles coming into the fleet for both new and imported used vehicles. This includes identifying opportunities to adopt standards that improve both safety

and emissions outcomes. There is also a need to support the uptake of proven safety technologies into the existing fleet. While some technologies cannot be easily retrofitted, technologies such as alcohol interlocks can be and could be used to improve vehicle safety in the existing fleet.

It is recognised that some vehicle types (e.g. motorcycles and heavy vehicles) are overrepresented in death and serious injury numbers. Fitting these vehicle types with safety technologies (e.g. ABS in the case of motorcycles) can bring significant safety benefits.

There is also a need to investigate the current warrant of fitness and certificate of fitness systems to ensure that the existing vehicles in New Zealand are as safe as they can be. In particular, the vehicle inspection regime must be fit to assess emerging safety technology, and there is a need to look at ways to incorporate new testing technology into the inspection process.

In the medium-to-long term, there is a need to work with the vehicle industry to accelerate the removal of less safe vehicles from the fleet. There are benefits for both safety and environmental outcomes if effective, sustainable, and equitable ways of increasing the number of less safe vehicles that are permanently removed from the fleet are found¹².

Waka Kotahi already has a Single Stage Business Case for the Vehicle Safety Promotion programme, which sought funding from the NLTP Road Safety Promotion Activity Class during the 2018-21 period, whilst providing ten-year cost estimates and targets to 2029.

Funding has only been approved for 2018-21 to date and while the SSBC was initially developed under the previous national road safety strategy (Safer Journeys) it was finalised and implemented under *Road to Zero*. The intent is to continue the Vehicle Safety promotion programme as part of the National Advertising and Education Campaign 2021-24.

Work Related Road Safety

Every day, thousands of people travel on New Zealand roads while at work. Some of these people are professional drivers, moving people and goods around the country.

Others drive as a secondary part of their main role, such as a tradesperson travelling between jobs, a salesperson visiting clients, and the many thousands of people working in agriculture and primary industries. All these people have the right to come home from work healthy and safe.

Too many workers are involved in crashes that result in DSI's. Often it is other road users who are killed in these crashes, particularly if they crash with heavy vehicles.

Work-related road safety is a critical issue for the *Road to Zero* Strategy, not only because of the size of the problem, but also because there is a real opportunity for businesses across the supply chain and across many sectors to take steps to significantly improve the safety of their workers and the public on the road. Shifting driving culture at work may also flow on to personal driving choices.

Research suggests that around **25 PERCENT OF ROAD FATALITIES INVOLVE A PERSON DRIVING FOR WORK** [Lilley, 2019].

This makes **ROAD CRASHES** by far the **SINGLE LARGEST CAUSE OF WORK-RELATED FATALITIES**.

BUSINESSES AND OTHER ORGANISATIONS HAVE BROAD OBLIGATIONS under the Health and Safety at Work Act 2015 to **ENSURE THE SAFETY AND HEALTH OF WORKERS** and others.

Commercial transport services also have specific obligations under the Land Transport Act 1998, such as **MAXIMUM WORKING TIMES**.

While **TRUCKS** are not involved in significantly more crashes per kilometre than other types of vehicles, these **CRASHES ARE FAR MORE LIKELY TO BE FATAL**, accounting for over **20 PERCENT OF ROAD DEATHS**.

Fatigue, distraction, and vehicle safety have been priority issues, as well as using chain of responsibility obligations (within industry) to drive change. Stakeholders have also noted that factors such as long working hours can also impact on the safety of workers travelling to and from their workplace. This issue is already a focus for several agencies and sectors and is an important part of WorkSafe's developing focus on working in and around vehicles.

Actions to improve work-related road safety will contribute towards both strategies, and be delivered in partnership across agencies, together with businesses and other organisations to effectively drive change.

To properly address the problem of work-related road safety, there is a need to clearly understand it. While it is possible to piece together data from a range of sources to get an understanding of the total level of harm, there is not currently a full picture of the key risks at play and harms that are occurring related to work-related road safety¹².

Improving this data will help the transport sector to better target efforts on work-related road safety, providing a better understanding of the causes of work-related crashes, the types of vehicles involved, and the industries and sectors that have the highest levels of harm.

There are also opportunities to work with the private sector to better share and coordinate work-related road safety information and develop programmes of work.

Road User Choices

Supporting good road user choices is fundamental to tackling road trauma. There is a need to build a safety culture where people not only accept, but expect road safety interventions and enforcement¹².

While a safe road system requires transport agencies to plan for people's mistakes by investing in improving the state highway and local road networks, tackling unsafe speeds and lifting the safety of the vehicle fleet, there is also an ongoing task to positively influence people's behaviour and attitudes on New Zealand roads.

There is no doubt that if everyone followed the rules, stayed alert and sober, drove at safe travel speeds for the road, stayed off their phones, and wore a seatbelt, death and serious injuries on New Zealand roads would decrease¹².

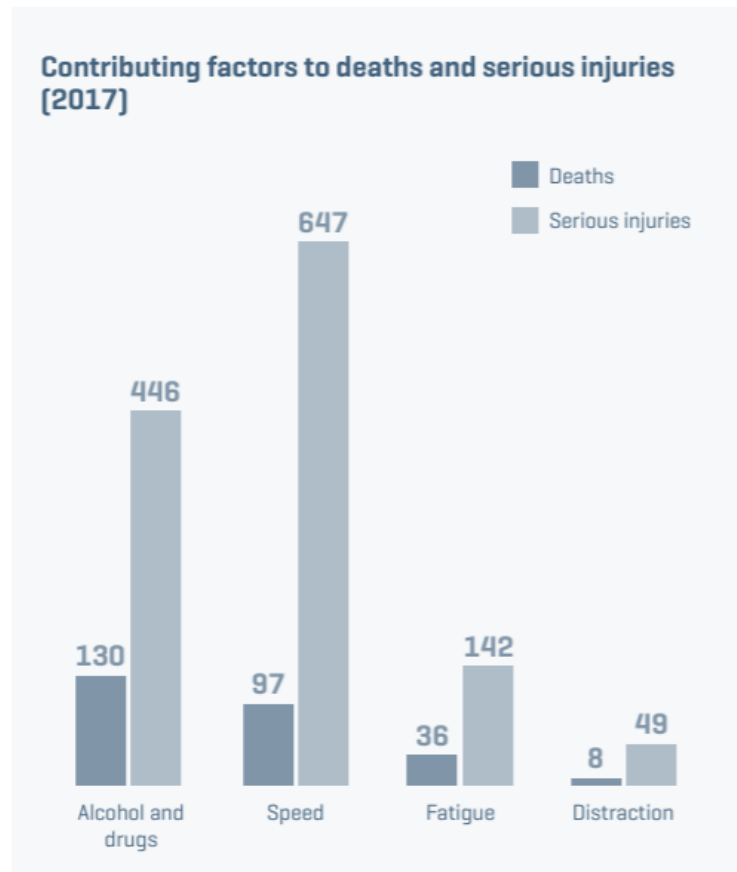
Figure 14 Road User Choices Evidence Snapshot (from Road to Zero Strategy)

WEARING A SEATBELT DURING A CRASH DOUBLES YOUR CHANCES OF SURVIVING a serious crash. Yet, every year, over 80 people die in crashes not wearing a seatbelt.

A recent AA survey found **66 PERCENT** of surveyed members **CONSIDERED ROAD USER BEHAVIOUR THE MOST IMPORTANT AREA FOR SAFETY GAINS** over the next decade [AA, 2019]

DISTRACTION OF TWO SECONDS or more can significantly increase the likelihood of a crash.

ONLY 26 PERCENT OF DRIVERS THINK THEY ARE LIKELY TO BE CAUGHT DRUG DRIVING, compared to 60 percent for drink driving.



Poor choices continue to be a major factor contributing to deaths and serious injuries. Driving (and motorcycle riding) are complicated tasks that require both knowledge and skill as well as dedicated, constant attention. While most road users intend to follow the rules of the road, many push the limits or occasionally make poor choices. It could be going too fast while turning at a busy intersection, driving too close when passing a cyclist or school bus, or it could be diverting attention, even for a second or two, to a phone or a passenger.

All these actions along with speeding, driving under the influence of drugs or alcohol, choosing not to wear seatbelts or use child restraints, driving while fatigued or driving while unlicensed or disqualified are contributors to harm.

Impairment from alcohol and drugs remains a significant contributing factor to deaths on New Zealand roads. While drink driving rates have decreased since 2012, some New Zealanders are driving after taking recreational or prescription drugs that can impair driving, with over 20 percent of road deaths involving a driver with drugs in their system. While the presence of these drugs in a driver's system does not necessarily indicate impairment, addressing this problem is an important part of improving the safety of New Zealand roads.

The effect of drugged driving can be escalated by alcohol, with both combined having far worse effects on driving ability than either substance alone. The current system for identifying drug-impaired drivers, based on a roadside behavioural test, is effective but does not adequately deter drug driving. Roadside testing for drug driving is undertaken infrequently and is time-consuming to administer¹².

System Management

International studies highlight the importance of strong leadership, good governance, and inter-agency coordination in the delivery of an effective road safety strategy. Countries that have made meaningful improvements to road safety have had leaders that have effectively made the case for change, and a

commitment to bringing communities with them¹². How those responsible for road safety work and collaborate, will be critical to the success of *Road to Zero*.

Road safety governance should provide strong leadership and have clear accountabilities for those government agencies and stakeholder organisations with responsibility for delivering road safety outcomes. There is a need for greater coordination across the system to enable an efficient, joined up approach to road safety and to work in partnership with Māori communicators, businesses and the wider public.

Local government has a critical role to play, both because it owns and maintains 88 percent of New Zealand's roading network, but also as an advocate for road safety in local communities. Stronger central and local government partnerships can help support local government leadership and promote effective coordination within and between regions. This should include sharing knowledge and best practice through forums such as Regional Transport Committees and the Road Controlling Authorities Forum¹². Strengthening coordination mechanisms through local Road Safety Action Planning is also recognised as critical.

Delivering on the government's obligation to work in partnership with Māori will require a stronger focus on Māori engagement, not only on the initial actions identified in *Road to Zero*, but also throughout the life of the strategy. There is a need to strengthen existing mechanisms for engaging and collaborating with Māori on road safety, in order to better understand and respond to the road safety challenges facing Māori communities¹².

Embedding and bringing to life Vision Zero is key to the delivery of *Road to Zero*. There is a need to identify and respond to key capacity and capability gaps to enable local and regional road safety responses to be well-resourced and to confirm that guidelines are being applied robustly and consistently. Vision Zero and Safe System capability programmes will be developed, as well as the continuing of professional Safe System Engineering courses and University programmes.

Improving the understanding of post-crash response is also important. A recent report found that improved post-crash care could have affected 11 percent of fatal crashes sampled. Most of these relate to crashes that occurred in rural areas. In some cases there was no one able to call 111 and in others it was difficult for emergency services to access the crash site¹².

Having access to sound data and a strong evidence base about what works will strengthen the understanding of the impacts of road safety on emergency services and health systems and improve responsiveness and capability. It is important that those responsible for road safety collect accurate and carefully targeted data and monitor new developments, particularly in the context of rapid social and technological change.

Regional road safety stakeholders and sector leaders have been clear that they face real challenges in collecting and understanding road safety data and trends. There is a need to provide agencies, local government and road safety groups with better information, intelligence and tools, and support capacity-and capability-building across the sector, to help them understand, communicate and respond to their road safety issues. Waka Kotahi is building several tools, models and capabilities that will improve the understanding of road safety problems.

These include:

- The Integrated Intervention Logic Model - The IILM is used to calculate potential savings in DSIs through a combination of interventions, working in tandem, across all parts of the transport system.
- MegaMaps - This risk assessment planning tool that identifies the highest risk parts of the network for speed management. It will be further refined to classify all schools and to identify the most effective locations for safety cameras
- *Road to Zero* Outcomes Framework - The Framework is a comprehensive set of indicators that enables us to measure road safety efforts and the effects they are having on improving the Safe System. It contains many new indicators, for which data will need to be collected

- Vision Zero Network Modelling - This will aim to measure the gap between the current state of the road network and the desired future Safe System state. This will identify and quantify future network improvements, in combination with developments in vehicle safety, to achieve close to zero DSIs.
- In-depth Safe System investigation of crashes - This involves leading a *Road to Zero* action to establish national in-depth crash investigation capability to evaluate crashes and inform associated research and policy development from a Safe System perspective to enhance the road safety knowledge base.

Overview of Road to Zero Interventions

Investment through the *Road to Zero* activity class will be targeted towards those interventions identified as being key to achieving the target reductions in DSIs sought through *Road to Zero* as summarised in Figure 15.

Figure 15 Road to Zero Focus Areas



Section two: Speed and Infrastructure Programme strategic case

This section of the PBC documents the case for investment in the SIP. It summarises the specific problems, benefits and investment objectives related to this specific focus area. The following problems relating to the SIP were discussed at a workshop held in July 2020 with Waka Kotahi representatives.

Problem One: The road network in New Zealand was largely designed and is still operated outside the bounds of human injury tolerance, resulting in unacceptable levels of harm for our community.

Problem Two: The planning, investment and delivery of road safety improvements does not effectively support the delivery of large programmes of improvements with a high number of capital works, this limits our ability to continuously improve customers' safety in a timely manner and on a large scale.

The first problem statement reflects the road safety issues and *Road to Zero* approach. The second problem statement relates to the challenges of delivering a large and complex programme of works and is based on lessons that have been learnt from the 2018-21 NLTP period.

Problem Statement One

The road network in New Zealand is largely designed and operated outside the bounds of human injury tolerance, resulting in unacceptable levels of harm for our community

Evidence of the Problem

Cause: The road network in New Zealand was largely designed and is still operated outside the bounds of human injury tolerance

It is widely recognised that parts of the state highway and local road network, particularly in rural areas of New Zealand, are narrow, unseparated two-way roads lined with roadside hazards such as fences, ditches, and trees. This risk is largely continuous across the road network. This means that serious road trauma can happen almost anywhere. For example, a momentary lapse in concentration could happen anywhere leading to the vehicle veering out of its lane, potentially resulting in a serious head-on or run-off-road crash.

To optimise DSI savings on rural roads, infrastructure measures are generally targeted to the highest risk roads (in terms of Collective Risk or DSI crashes per kilometre) to prevent conflicts, or speed management is implemented to lower the severity of injury should a crash occur. Large sections of the rural road network are speed limited (sign posted) at a higher speed than is deemed to be safe for the road conditions. Even with the removal of 1- and 2-star vehicles and 100 percent compliant driving behaviour, the rural road network is predominately designed and operated outside the bounds of human injury tolerance.

In urban areas there are often several conflicting movements by a range of modes. As an example, urban areas typically have high traffic volumes which conflict with high volumes of pedestrian and cycling movements. These conflicting movements often occur with no physical separation or dedicated infrastructure provided to minimise these conflicting movements and provide safe access for all users. This can result in community severance and increased risk of harm, particularly for vulnerable users such as pedestrians and cyclists.

Existing Road Network Conditions (Infrastructure)

Unforgiving roads and roadsides increase the likelihood of crashes and the risk of DSI's. Safe infrastructure is not only necessary to reduce road trauma but also to contribute to wider health benefits and the well-being of communities.

The Safe System approach has at its core the recognition that humans make errors while using the road system. Scandinavian research (Elvik) suggested that 50 percent of fatalities and 70 percent of serious crashes

are a result of driver error where drivers were not necessarily breaking the rules. This has been supported by recent South Australian research (The relative contribution of system failures and extreme behaviour in South Australian crashes; Wundersitz et al, 2011). In addition to improving driver behaviour, driving at a safe and appropriate speed and vehicle safety quality, Waka Kotahi and local road partners also need to improve the road and roadside infrastructure to reduce risk to road users.

Forgiving roads and roadsides can be the difference between life and death. The majority of DSI's (around 90 percent) can be attributed to four high risk crash types, as shown below for the ten-year period 2009 to 2018¹⁷:

- Head-on crashes: 929 people died in head-on crashes on New Zealand roads
- Run-off-road crashes: 1,254 people died in crashes where a driver lost control or ran off the road
- Intersection type (side impact) crashes: 372 were killed in crashes at intersections
- Crashes involving pedestrians and cyclists: 332 pedestrians and 78 cyclists died in crashes involving motor vehicles, largely in urban areas¹².

Contributing to the level of harm (DSI's) are unforgiving roads and roadsides, where a high proportion of crashes occur due to poor road geometry and line of sight, road surfaces that sometimes do not see much sunlight during winter months and roads that have a high number of roadside hazards, as shown in Figure 16. Whilst this image is not a representation of the whole network it is not unusual for sections of the state highway and local road network.

Figure 16 Example of Unforgiving Roads and Roadsides – State Highway Network



Sustained longer-term improvements in road safety performance requires a proactive approach to speed and infrastructure. As individual high-risk locations are successfully treated, a growing proportion of crashes are likely to occur at locations without a previous crash history. Currently 50 percent of DSIs occur on 10 percent of the network, indicating a starting point for areas where infrastructure improvement is needed. The majority of DSIs (55 percent) occur on the rural network (and 70 percent of deaths), with the remaining 45 percent of DSIs occurring on the urban network.

¹⁷ Road to Zero 2030 Infrastructure Programme, 2019

As more individual high-risk locations are successfully treated, a growing proportion of crashes are likely to occur at locations with no previous crash history. Currently 61 percent of DSI crashes occur at locations where there has not been another injury crash in the past five years. For the longer term it is better to reduce crashes through a systematic, proactive approach that aims to upgrade infrastructure in accordance with Safe System design principles.

A proactive approach includes designers understanding where risks are inherent on a road network and planning for treatment on a priority basis before crashes begin to occur. Investment in safer road infrastructure, such as roundabouts or median barriers, can incur significant up-front expenditure. However, once constructed these measures typically provide a permanent reduction in casualty risk, saving lives every year.

Speed

Faster travel speeds reduce the ability to avoid or recover from mistakes, and exponentially increase the level of harm to everyone involved in a crash. The default speed limit setting in rural open road environments is 100km/h. Under a Safe System, road users should be protected from any potential head-on crashes involving impact speeds above 70km/h. Currently this can be achieved through either physical separation (median barriers) or lowering operating speeds on roads that don't have physical separation. Where insufficient infrastructure is in place, operating speeds must be reduced to lessen the impact of a crash.

Impact speed affects the severity of every crash. In the event of a crash, there are physical limits to the amount of force human bodies can take before they are injured, and chances of survival or avoiding serious injury decrease rapidly above certain impact speeds. For a pedestrian, wheeled pedestrian, cyclist, or motorcyclist hit by a car, this speed is around 30-40 km/h. In a side impact collision involving two cars, it is around 50 km/h, whereas in a head-on crash involving two cars, this speed is around 70-80 km/h.

Reduced speeds also reduce the stress for other road users, including passengers, and help other people feel safe to walk, bike, or travel with children. To create a Safe System and achieve New Zealand's Vision Zero aspirations, there is a need to work towards a road network that limits exposure to crash forces above the Safe System speeds shown in Table 4. Approximately 87 percent of the road network length (including state highway and local roads) does not currently have a 'safe and appropriate speed' for the condition of the road¹².

Table 4 Safe System Speeds

Road and Section Types Combined with Road Users	Safe System Speed
Roads and sections used by cars and vulnerable users	30 km/h
Intersections with possible side-on conflicts between cars	50 km/h
Roads with possible frontal conflicts between cars	70 km/h
Roads with no possible frontal or side-on conflicts between vehicles, and no vulnerable users	> 100 km/h

In 2016, travelling too fast for the conditions was the second highest contributing factor to fatal and serious injury crashes. In the event of a crash, regardless of its cause, the speed of impact is the most important determinant of the severity of injuries sustained and the probability of death. Speed continues to be a major contributing factor to DSIs on New Zealand roads.

There is strong evidence that a decrease in the mean travel speed on a road leads to a decrease in the number of crashes, as well as the crash severity. At lower speeds, vehicles have shorter braking distances and people have more time to react and take action to avoid a crash. When crashes do occur, lower travel speeds mean the crash impact energy is lower, reducing the severity. Reducing speeds has also been a dominant focus in other jurisdictions that have made significant and sustained road safety gains.

Figure 17 shows that small reductions in speed can have significant impacts in the number of crashes that occur. There have been many empirical studies that have assessed to what extent a change in average speed on a road affects the number and severity of crashes on that road. The relationship between speed and road safety can be well described in terms of a power function and that a change in mean speed affects serious crashes.

To present the power function of Nilsson, this would mean that a one percent change in speed results approximately in two percent change in injury crash frequency, three percent change in severe crash frequency, and four percent change in fatal crash frequency.

Figure 17 Relationship between Mean Speed and Crashes by Severity (Nilsson, 2004)

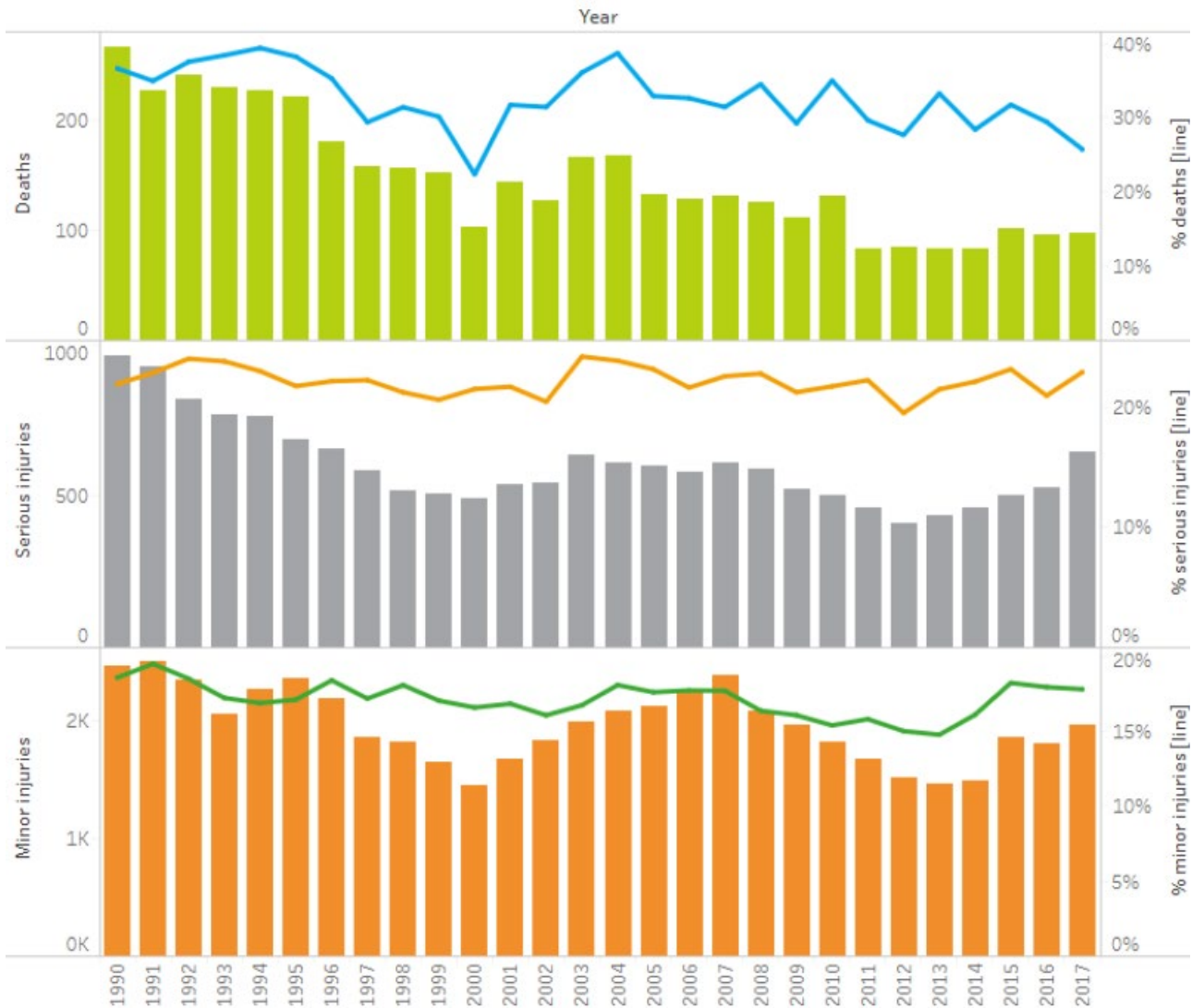


Figure 18 shows the historic trend in DSI crashes where speed was identified as a contributing factor. The data shows little change in the number of fatalities since 2011 and an annual increase since 2011 in the number of serious injury and minor injury crashes involving speed¹⁸.



¹⁸ Tackling Unsafe Speeds Programme Business Case, Waka Kotahi, 2020

Figure 18 Death and Injury Crashes where Speed was Identified as a Factor, 1990 to 2017



Effect: Unacceptable levels of harm for our community

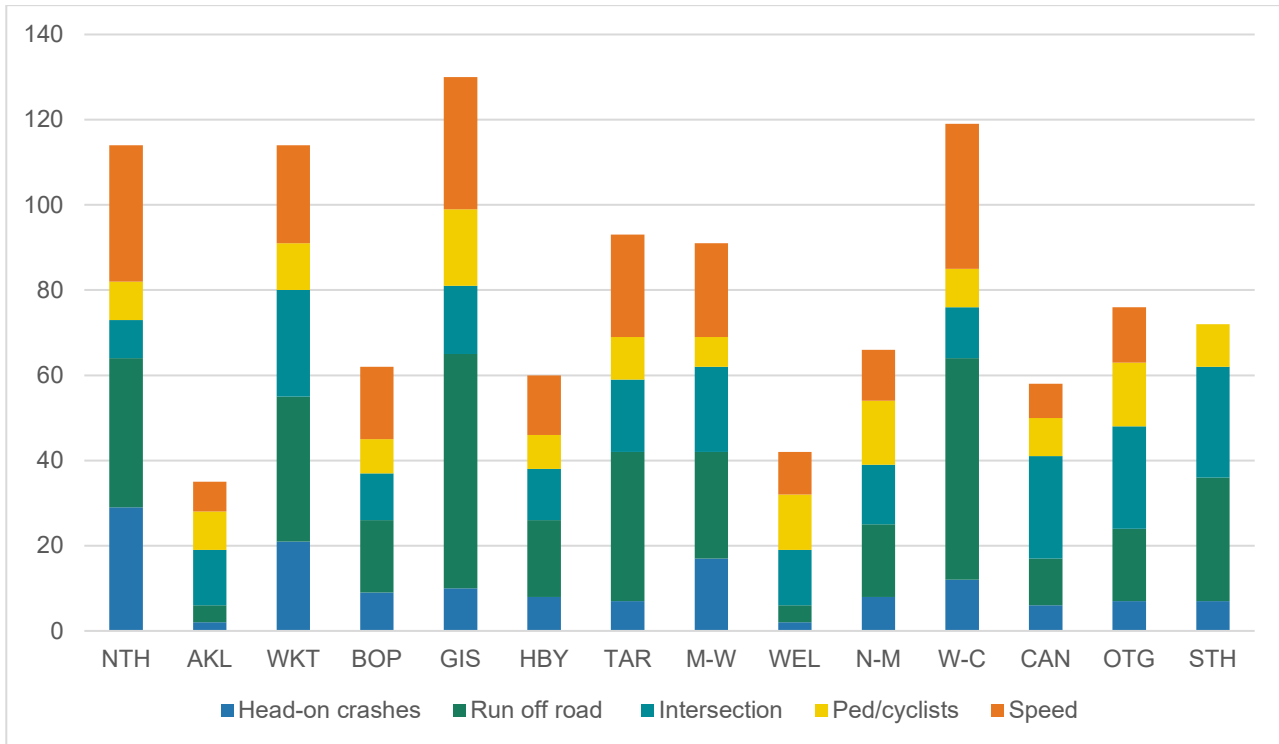
The government’s *Road to Zero* Strategy sets the precedent that any level of harm is no longer acceptable on New Zealand roads. New Zealand is over-represented in DSI crash statistics, with a significantly higher rate of DSIs when compared with that of other OECD countries¹⁷.

Over the past six years there has been an unprecedented rise in the number of DSI’s on New Zealand roads. About half the people who were harmed did not contribute to the crash. Figure 19 gives an indication of the distribution of DSIs relating to speed and infrastructure across the network by region.

The data shows that across all regions, run off road was the highest crash type per 100,000 population, accounting for 31 percent or 353 DSI crashes in 2018. This is followed by speed, which accounted for 22 percent or 247 DSI crashes and then intersections 21 percent or 236 DSI crashes.

In 2018, the Gisborne region recorded the highest number of speed and infrastructure DSI crashes per 100,000 people, with a rolling 12-month average of 130 DSI crashes. This was followed by West Coast with an average of 119 DSI crashes and Waikato and Northland, both with 114 DSI crashes per 100,000 people.

Figure 19 Speed and infrastructure Crashes by Region (12 month rolling average, deaths, and serious injuries per 100,000 population), 2018



Approximately half of all fatalities and 71 percent of injuries are not caused by reckless behaviour, demonstrating the traumatic impact that mistakes or unexpected incidents can have on New Zealand roads¹⁹. If everybody obeyed the road rules, there would still be an estimated 200 road deaths per year²⁰.

These crashes not only have an impact on the lives of the people involved, they also come at a social cost, estimated at \$776,000 per serious injury¹⁹, or \$4.8 billion per year¹⁷.

Implications of the Evidence

New Zealand currently ranks in the bottom quarter of the Organisation for Economic Cooperation and Development (OECD) member countries for road safety. It is evident that current speed management and infrastructure on New Zealand roads falls short of what is necessary to achieve a Safe System on both the state highway and local road network. The absence of safe roads and roadsides means people are vulnerable to serious injury when a crash occurs. Where there is insufficient infrastructure in place, speeds are not always sufficiently reduced to reflect the level of risk.

Under the government's *Road to Zero* vision, no level of harm is acceptable on New Zealand roads. To address these problems, roads and roadsides can either be 'engineered up' through infrastructure improvements to support existing or higher travel speeds, or speeds can be lowered to reflect the place function and surrounding environment.

In summary, ongoing investment in speed management and infrastructure improvements are required on both the state highway and local road network to help eliminate potential conflicts wherever possible, or to lower crash energy where separation of conflicts is not possible.

¹⁹ AA Crash Causes: What Happened? <https://www.aa.co.nz/membership/aa-directions/driver/crash-causes-what-happened/>

²⁰ High Risk Rural Roads Guide, 2011

Problem Statement Two

The planning, investment and delivery of road safety improvements does not effectively support the delivery of large programmes of improvements with a high number of capital works, this limits our ability to continuously improve customers' safety in a timely manner and on a large scale.

Evidence of the Problem

Cause: *The planning, investment and delivery of road safety improvements does not effectively support the delivery of large programmes of improvements with a high number of capital works*

A key challenge for the next NLTP period (2021-24) is the ability of the SIP to deliver at the scale and pace required to meet the *Road to Zero* desired outcomes from the SIP. A review of the current 2018-21 NLTP period has identified challenges with the way the SIP is currently managed and delivered, including:

- **Governance:** There is currently a level of ambiguity in accountabilities, reporting lines and roles and responsibilities within Waka Kotahi and across the agencies responsible for the delivery of *Road to Zero*, which can lead to delay, confusion and the risk of conflicting decisions.
- **Local Road Partnerships:** Further support is required to refine, communicate, and embed processes and procedures to support the delivery of the local road programme and better support local councils.
- **Investment Approvals:** Funding applications are submitted individually, rather than as a package of projects, which means applications are not currently scalable to reflect the size of the SIP. There are also multiple funding pathways, including a simplified funding pathway. However, this is not having the intended effect of shortening the project lifecycle or reducing the use of limited resources, due in part to delays through the approvals process.
- **Capability and Capacity:** Additional resources will be required to deliver at the scale and pace required to meet the *Road to Zero* outcomes. This includes providing additional resources in the areas of programme management, design and communications and engagement.
- **Communication and Engagement:** Communication and engagement at a SIP wide level, regional and at a project level could be improved, both internally and externally to raise awareness of the *Road to Zero* approach, why it is needed and to help build support for road safety interventions.
- **Monitoring and Benefits Realisation:** The tools, systems and technology required to support the SIP ecosystem are not integrated, requiring manual integration, which makes it challenging and time consuming to meet reporting requirements. This is partly because programme information is held in different systems for funded and unfunded projects and reporting is undertaken using manual processes.

These themes are explored in more detail in the following section of the PBC. The information below provides an insight into the current SIP. The purpose of this section is to demonstrate how the current SIP faces specific challenges related to the planning, design, and delivery of safety improvements. These insights were gathered via interviews with SIP team members in September 2020.

Speed Management Insights

Sub-Programme Management and Processes

To be successful, the sub programme must manage tranches of 50+ projects through a project lifecycle. This requires a large amount of programme (and project) management activities to effectively manage the pipeline of work and confirm that projects are progressed from technical assessment to feasibility within an adequate timeframe.

Although work has been completed on developing general processes and procedures at the early stages of the Speed sub-programme, it has been identified that there is ongoing lack of clarity surrounding processes

and procedures related to endorsement or project sign-offs and roles and responsibilities within these processes. Further support is required to refine and embed processes and procedures. This lack of clarity may increase delays and wait times during a project lifecycle.

Capability and Capacity

Within the Speed sub-programme there is a resourcing challenge to deliver at scale and pace, with the team supporting 180+ projects from project definition to project close. This is evident by the need to support large tranches of 50+ speed projects progressing through the project lifecycle. Areas identified include:

- **Increased Safety Engineer Support:** Regional Safety Engineers are under pressure to review a large amount of technical assessments within a short timeframe. Increasing capability would enable a faster delivery model. Regional Safety Engineers have already undertaken a large portion of the technical assessments for the state highway network, however additional support is needed in the design and consultation phases and also to support local road partners.
- **Increased Communications and Engagement Support:** A Speed project requires a large amount of support from the communications and engagement team who are placed under pressure to conduct communications and gazetting activities. Increased resourcing in this area would provide more opportunities for community engagement and consultation.
- **Approvals:** The Speed sub-programme requires approval from Operational Policy, Planning and Performance (OPPP) to proceed with a recommended speed change. Currently there is one person conducting this approval process, resulting in pressure and potential delays.

Investment Approvals and Governance

Currently, there are three approval gateways for an SNP Speed project (SNP Leadership, Waka Kotahi ELT, and Waka Kotahi OPPP). To improve this complex process, recently it has been reduced to two gateways for standardised projects, with Waka Kotahi OPPP being engaged earlier in the process to reduce approval wait times. To further improve this process, a formalised sign-off acknowledgement by approval participants at each stage gate would reduce confusion or delays.

Reporting

Within the last six months, a new speed project management database tracking consultant activity was created, and Waka Kotahi's Planview application has been configured to capture key speed project milestones. This means reporting capability is improving as more information is being collected. Further improvements within this area will support providing visibility to the sub-programme to focus on managing exceptions and monitoring project activity durations.

Regarding delivery of speed changes, it has been identified there is a need to conduct further work within the quality control processes and issuing of practical completion certificates. Apart from this area, projects delivery and panellist consultancy delivery are proceeding well.

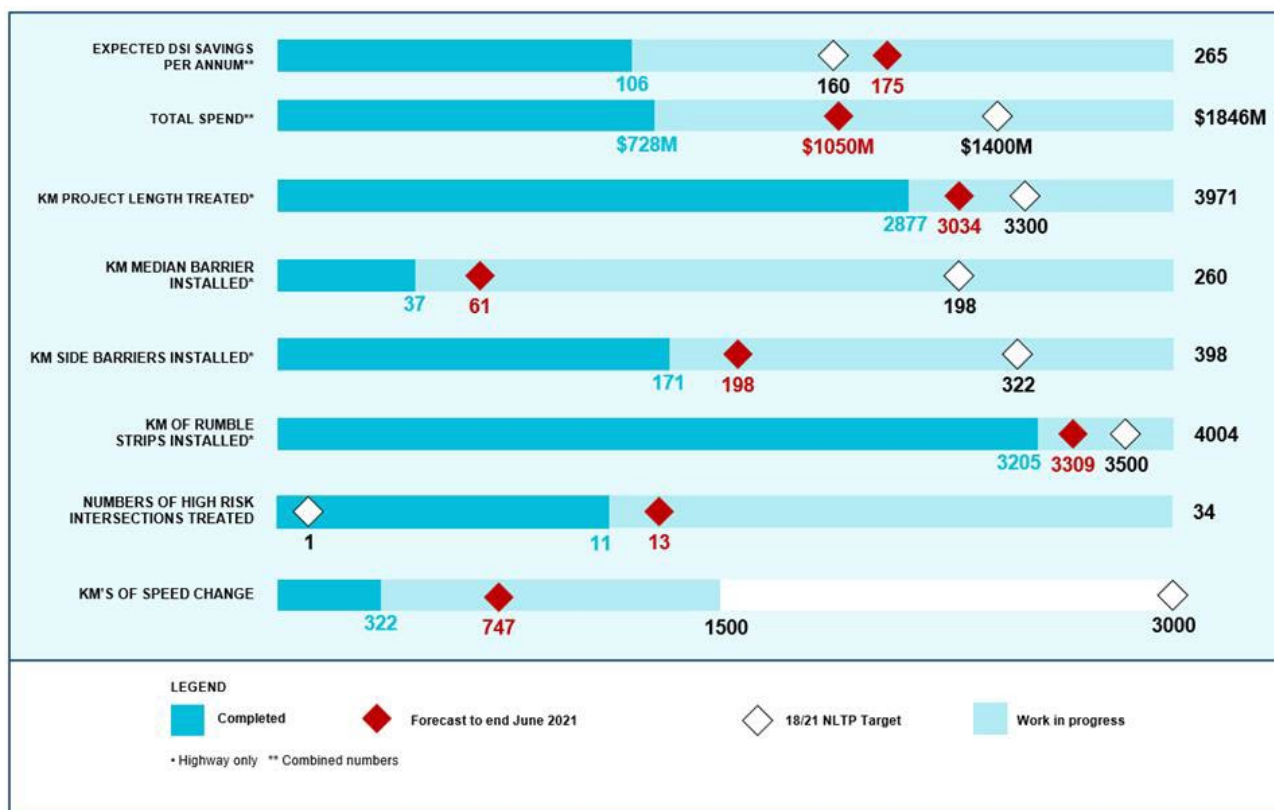
State Highway Insights

Figure 20 provides an overview of the performance of the current Safe Networks Programme for the 2018-21 NLTP period. It shows that to date, \$728 million has been spent, this is forecast to increase to \$1.05 billion by the end of the current NLTP period. This is compared to the \$1.4 billion spend that was planned for the current NLTP period. Despite the reduced forecast spend, the SNP is on track to exceed the target of preventing 160 DSI's per year.

However, there have been just 37 kilometres of median barriers installed of the 198 kilometres planned for in the NLTP period, and 322 kilometres of the planned 3,000 kilometres of speed change implemented.

Figure 20 demonstrates that while some targets are being met, the SNP has struggled to meet all the programme delivery expectations. Without intervention, the SIP will struggle to deliver at the increased scale and pace required to meet the *Road to Zero* outcomes.

Figure 20 Safe Networks Programme Progress towards Key Performance Indicators (2018-21)²¹



Median barrier and intersection improvement projects form a key component of the current SIP; however, delivery continues to progress slower than anticipated. This is partly because of the current economic evaluation process, which leads to a de-prioritisation of these treatments because of the dis-benefits associated with travel times. This is despite these interventions achieving high safety benefits. Most of the current median barrier and high-risk intersection projects under consideration will not be completed until the next NLTP period (2021-24).

Whilst the current SNP hasn't hit all of its 2018-21 targets and would struggle to enable the successful delivery of the *Road to Zero* outcomes, it has established key roles and launched the streamlined investment funding pathway (SSI Toolkit) and project initiation approvals process in the setup phase. It has also established two professional service consortia to support project development, design, and delivery. The programme provides a foundation to lift performance to deliver at the scale and pace required to achieve the *Road to Zero* outcomes.

Comparing the SSI Investment Pathway process to the previous Single Stage Business Case Process (SSBC) used in the Safe Roads Alliance, has identified the following:

- Efficiency gains have been achieved for SNP by reducing effort in creating a funding application. The SSI Application requirements are 'lighter' and require less investigation effort compared to a SSBC.
- The *Road to Zero* model, Pipeline Development Tool and SSI Toolkit automate or provide clear guidelines for the initial project baselines for project scope and location. This has enabled efficiency gains in the SNP funding process compared to the previous Safe Roads Alliance investment assurance processes.

²¹ Data reflects a point in time: provided 28th October 2020

- However, it has been identified SNP Steering Group endorsement is an additional approval gateway that was not implemented for the Safe Roads Alliance.

Processes and Delivery

Although work has been completed on designing general processes and procedures at the early stages of the State Highway sub-programme, it has been identified that there are improvements needed still on certain processes and funding procedures such as Project Handovers, Project Change Control or Implementation Funding Approvals. Improvements required are both internal and external to the SNP team. Further support is required to refine and embed processes and procedures, however, improvements in this area are already underway with dedicated capability resource.

Investment Approvals

Project Managers are required to apply for funding for a Price Level Adjustment (PLA) or for Implementation Funding. It was been identified that these processes are not well understood and are currently a lengthy process with multiple gateways for more complex projects. In some cases, where a project increase is contributed to the intervention cost being increased outside of the expected Standard Safety Intervention (SSI) cost ranges, this triggers a more complex review and approval process. In the past this has resulted in delays to projects as it may require a new funding pathway request to be completed to seek approval.

Case Study – Standard Safety intervention estimated costs SH22 Glenbrook RAB

The State Highway 22: Drury to Paerata corridor project is a medium to high risk corridor, with an indicative treatment of a roundabout. Currently, this intersection is a give way, controlled intersection with high volume of turning traffic.

In March it was identified a PLA would be required for additional funding with a lack of clarity of process around increased costs outside of expected SSI cost ranges, this resulted in confusion if a Price Level Adjustment (PLA) would suffice or if a new funding pathway for SSBC Lite was required.

The team will address the issue by:

- Establishing programme specific project controls framework that highlight the steps required for scope changes or cost increases. (COMPLETE)
- Supporting the PM by reviewing design and scope changes for projects in flight
- Review the intersection cost ranges in the SSI guidance – (SSI guide review underway to adjust estimates)

Parallel Phases and Procurement

It has been identified that delays in funding approvals are impacting procurement activities for, and hence continuity of design, as typically this phase of a project does not commence until funding is received. To counter this delay, the sub-programme is seeking to begin design procurement activities with the Consortia prior to funding being approved. This enables professional services to be secured and minimises the impact to project delivery timelines. This change in approach results in reduced risk to the programme and enables the Consortia to begin planning activities in preparation for design funding approval.

Capability and Capacity

The State Highway Programme is managing an estimated 70 projects through the project pipeline. To reach the *Road to Zero* targets, the programme must have a minimum of 30 projects in construction to meet the desired delivery rate.

To support scaling up the throughput of the delivery pipeline to double current projects, and once funding certainty is secured, a flexible procurement approach where designer and contractor are involved early and are given visibility of the pipeline of work will speed up the process considerably. Waka Kotahi can make this kind of step change and are already doing this for state highway projects. However, this is a significant change for local road projects, and there are certain critical success factors that *Road to Zero* and the SIP need to achieve to provide the best chance of success. This will require Waka Kotahi to move quickly to improve:

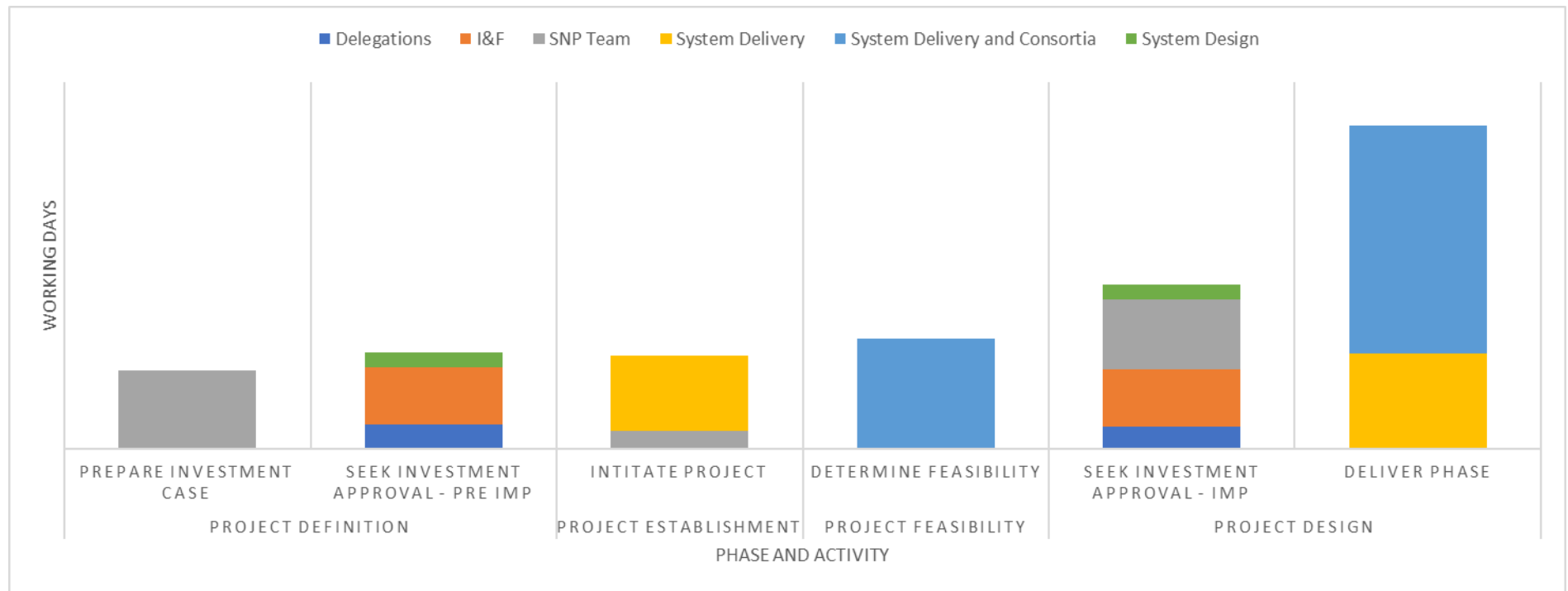
- Increasing throughput – Waka Kotahi need to increase throughput and lift the rate of production. There is a need to identify the right size of project for state highways and local roads e.g. **large packages are suitable for the state highway programme** because they have the capacity to deliver at that scale, in contrast to smaller projects which are more suitable for a number of local authority partners.
- Agile Delivery - Help to optimise the programme by closely managing cashflow to be able to start projects when other projects slow down. This will mean that SIP will need to **over programme and have programme level contingency** to achieve the *Road to Zero* targets.
- Delivery performance monitoring - Track and **measure the delivery progress** of each project in the programme more often (state highways and local roads) including the safety output metrics e.g. kms of median barrier etc.
- Adjust the resource capability to suit the demand - Increase resourcing and the capability with **an agile resource model** available to the programme at its different stages.
- Improve the ability to change - embed new process/ decisions points in Waka Kotahi's business model with **better change management** (see process change) example, Programme Workflow Lifecycle Time Modelling Analysis.

Further discussions with staff from the SIP team and stakeholders within Waka Kotahi has been undertaken to better understand where delays occur in the current SIP process, in addition to those identified above. This analysis has been undertaken for the current SIP state highway and speed management sub-programmes, which Waka Kotahi is responsible for delivering. It is not possible to model a local road project using the same methodology as each local council has a unique process and approach to the management, approval, and delivery of local road safety improvement projects.

State Highway

Workflow lifecycle time modelling analysis of a typical SIP state highway SSI project is provided in Figure 21. This shows the typical duration of a project at each key phase, including wait times. The total duration is estimated to take approximately 700 days.

Figure 21 State Highway SSI Project Workflow Lifecycle Time Modelling Analysis Task Total Duration (working days)



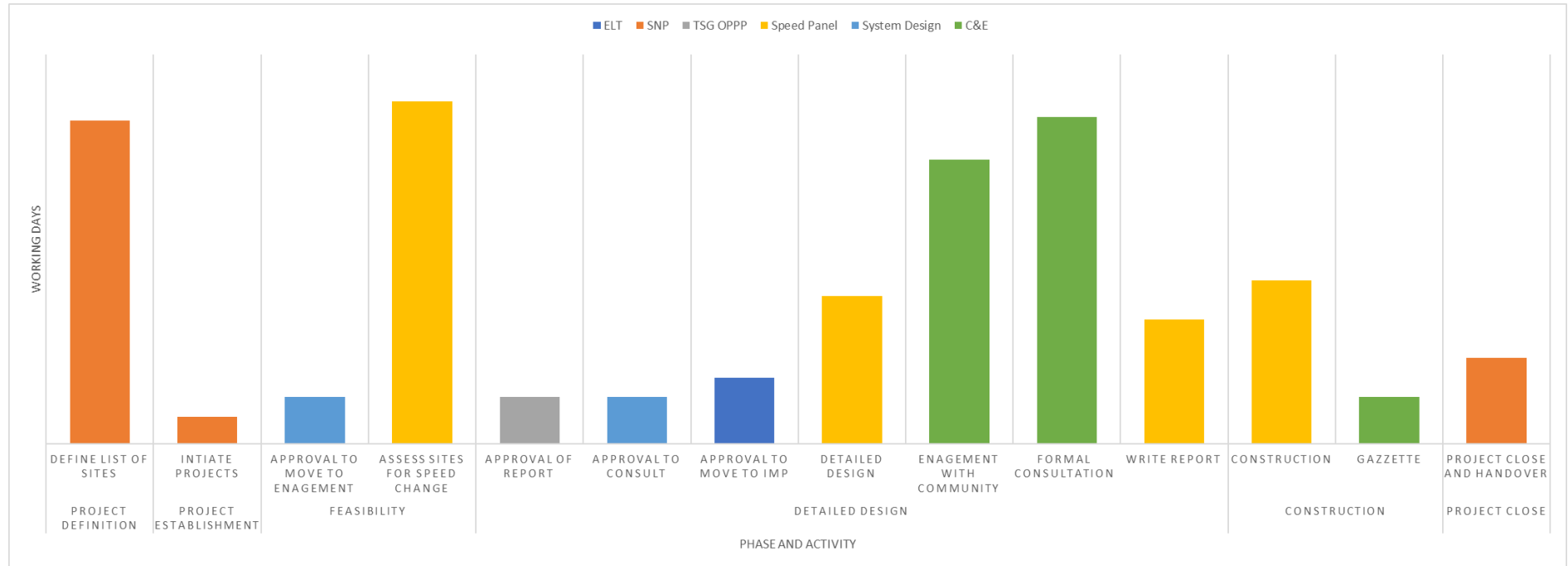
The larger columns indicate potential areas for improvement and where they may be delays in the existing approach. The main areas for improvement with a state highway SSI project are during the investment approval phases, which are undertaken prior to the pre-implementation and implementation phase. As shown in Figure 21, the project definition phase is dominated by seeking pre-implementation investment approval which includes Investment Quality Assurance, approval by the SNP Steering Group, approval from Delegations Committee and CFO approval to proceed. The duration of the pre-implementation investment activities (including wait times) are typically longer than the time taken to prepare the investment case. Investment approvals are also required prior to the delivery phase as shown in the project design activity.

Early approval of both the ten-year Strategic SIP (2021-2030) and the SIP Delivery Programme (2021-24) is critical to drive delivery momentum. An approved programme will enable Waka Kotahi to build towards the level of investment required across the ten-year programme to achieve the desired *Road to Zero* outcomes. Alongside funding certainty, there is a need to accelerate Waka Kotahi approval processes at an individual project and programme level. This will help provide certainty to the wider sector in terms of the scale of the forward work programme. There is an opportunity to package state highway SSI funding applications based on location or treatment typology which would help to reduce the number of individual funding applications that need to be developed and approved.

Speed Management

Workflow lifecycle time modelling analysis has also been undertaken for a typical SIP speed management project as shown in Figure 22. This shows the typical duration of a project at each key phase, including wait times and the business unit lead for each task. The total duration is estimated to take approximately 530 days. This is supported by feedback from the SNP team that a speed management project can take up to 18 months to complete.

Figure 22 Speed Management Workflow Lifecycle Time Modelling Analysis Task Total Duration (working days)



Project definition is dominated by project identification and funding. Feasibility is dominated by the technical assessment and detailed design by engagement with the community and consultation. The main delays occur during the internal review of a Speed Technical Assessment, which can take up to three weeks to complete. A speed management project also has multiple approval gateways. In total, approval for a project to proceed is undertaken at three points (prior to Engagement, Consultation and Construction) within the workflow and OPPP approval is required prior to seeking endorsement to progress to construction.

The SIP team are currently investigating opportunities to optimise speed projects by running tasks in parallel, which aims to reduce the workflow timeframe from eighteen months to ten months.

The delivery challenges associated with the current SIP (2018-21) and proposed responses are explored further in the Management Case within Section 5 of this PBC.

Local Road Insights

Local Road Partnerships and Communication and Engagement

Work has recently been undertaken to design and implement processes and procedures at the early stages of the Local Road sub-programme. However, there was not enough time to embed the systems and processes to communicate well during the current NLTP (2018-21) and as an emerging activity, delays were experienced for some projects such as Evans Pass or Masterton to Castle Point, both of which required additional relationship support from subject matter experts for the corresponding Local Council. At the time the strategy was to progressively improve the 2018-2021 programme and work towards establishing a better 2021- 2024 programme.

Capability and Capacity

It was identified the Local Road Programme requires more support in the next NLTP (2021-24) to effectively support Local Partners and deliver an effective Local Road Programme. The role of Waka Kotahi is to actively support and facilitate the development of the *Road to Zero* SIP programme so that it is:

- Aligned with the *Road to Zero* Strategy
- Considered fundable by the Waka Kotahi investment framework
- Ready by 1 July 2021

Resourcing is a critical issue for the successful development and delivery of the *Road to Zero* Local authority programme. The areas that Waka Kotahi require additional effort are:

- Relationship management and support for our partners from subject matter experts
- Performance monitoring of the Local authority programme – Specifically delivery information about individual project
- Safe system advice - Increased Safety Engineer Support
- Communications support and engagement strategy

The team will address the issue by:

- Complete the programme development of the *Road to Zero* aligned local authority programme (COMPLETE)
- Establish a *Road to Zero* performance monitoring system (UNDERWAY)
- Baseline the local programmes by February 2021
- Assist all 45 capital local authority projects for funding before the start of the 2021 NLTP
- Integrate the local authority Speed programme with Highway programme
- Review the quality the guidance provided and support for local authority SSI applications
- Establish the future resource model for the local partners including internal Waka Kotahi Team requirements

Case Study: Winchester-Geraldine/Coach/Tiplady Intersection Improvements

An example of a positive outcome is the Winchester-Geraldine/Coach/Tiplady Intersection Improvements project. This project demonstrates the positive outcomes that can be achieved when processes are embedded, and the right people are involved in the process. The Timaru District Council initially chose to progress a safety project at a 5-leg high risk intersection with minor intersection upgrades and an intersection speed zone warning system.

This decision was primarily driven by a LCLR solution to avoid additional complexities of seeking funding approvals for capital projects (\$1 million +). A workshop was held with the local Area Programme Manager (APM), regional safety engineer and the Waka Kotahi investment team. The purpose of the workshop was to review the programme, to promote SNP and to discuss the treatment of the high-risk intersection. The discussion included eligibility for TEFAR, the sharing of the new SSI toolkit and an overview of the different funding pathways to enable projects to be designed and delivered faster.

Following the workshop, the local authority (Timaru District Council) decided to instead progress an application under a safe system principle, for a right-sized intervention (rural roundabout) to address the risk at this intersection. The SSI application was drafted in partnership with Waka Kotahi and resulted in funding being approved. This case study demonstrates the benefits of:

- Genuine engagement and a strong relationship between Waka Kotahi and the local authority
- The SSI Toolkit being used successfully to determine the most appropriate safe system treatment
- The use of the most appropriate funding pathway, including the use of TEFAR
- Less complex (and faster) process = right outcomes

Effect: *Limits our ability to continuously improve customers' safety in a timely manner and on a large scale*

Implications of the Evidence

The SNP key performance indicators for the 2018-21 NLTP indicate that from an outcome perspective the current process is still creating delays in the delivery of safety projects, the key delays include:

- Funding for new projects were not confirmed until August 2019, which meant individual SSI applications could only start after this. This has resulted in a reduction in the number of projects in construction (12 in October 2020) as the designed projects that started in January 2020 move to construction in late 2021.

The 2021-24 SIP requires greater funding certainty and funding approval so there is no lag.

- The current approvals process is fragmented and undertaken "project by project". This increases the total number of approvals and administrative workload. To achieve the *Road to Zero* delivery rate, 30 projects need to be in the construction phase and 40 projects in design at the start of the next NLTP period.
- The management and delivery processes of the SNP programme play a key role in determining the overall success of the SIP and wider *Road to Zero* Strategy. The evidence presented in this section suggests that are opportunities to improve and streamline processes to meet the desired *Road to Zero* outcomes.

Benefits

The key benefits identified for the SIP PBC include:

1. A reduction in death and serious injury crashes where speed and infrastructure are identified as a contributing factor
2. Timely delivery of safety improvements

The primary and most important benefit is the lives saved and the reduction in serious injuries to road users by creating a safer transport network.

Benefit One: A reduction in death and serious injury crashes where speed and infrastructure are identified as a contributing factor

Investing in speed management and infrastructure improvements is expected to result in a reduction in DSI's on New Zealand roads. There are several strategic catalysts driving the prioritisation of road safety. One of the biggest influences is the Vision Zero philosophy adopted by the government as part of the *Road to Zero* Strategy. This philosophy states that DSI's are not acceptable on New Zealand roads and embraces a transformative mind set in making all roads safe.

The *Road to Zero* Strategy outlines how the transport system needs to be designed to be more forgiving and protect road users when human error inevitably occurs. Speed management and infrastructure improvements are just one part of the solution, however investment in the SIP is expected to have the largest impact on DSI reductions, contributing approximately half of the 40 percent DSI reduction outcome.

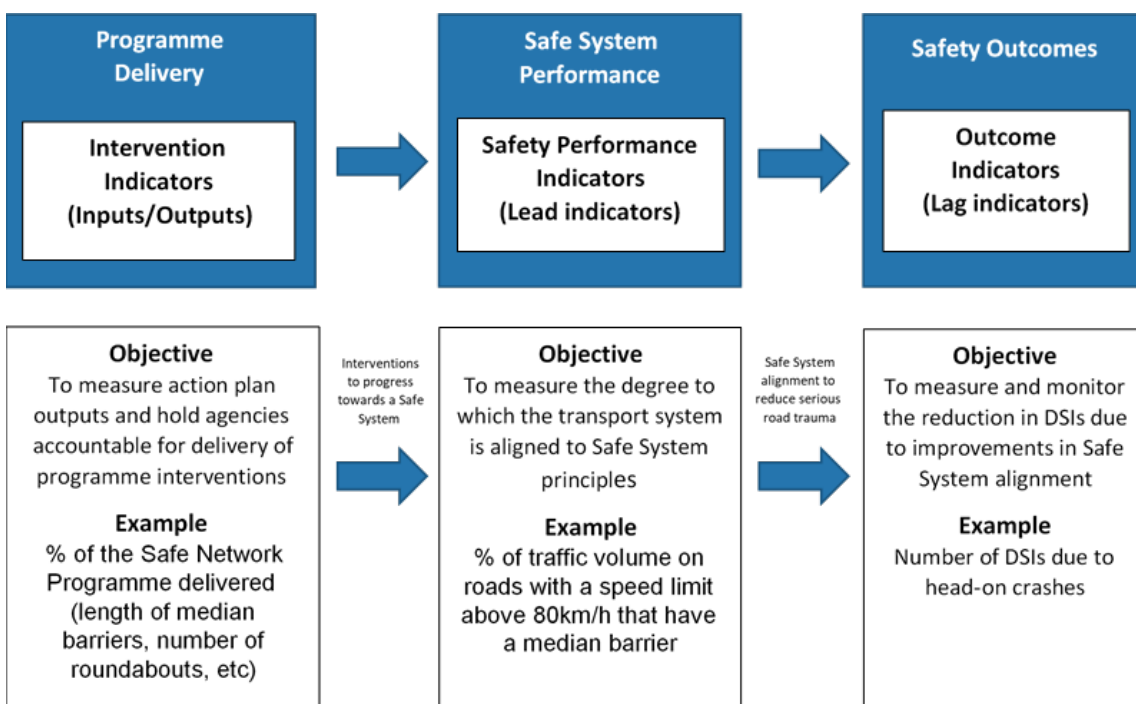
Benefit Two: Timely delivery of safety improvements

The efficient delivery of the SIP will allow safety projects to be approved and delivered in a timelier manner. This will reduce the time taken for approvals and allow for a greater number of safety programmes to be implemented. A timelier delivery of safety improvements on New Zealand roads will reduce the risk to all road users.

A critical success factor for countries that have made significant progress in reducing DSI's in recent years is data-driven problem identification and the development of evidence-driven countermeasure packages. These are then formalised in a strategy for effective implementation, combined with ambitious, quantitative targets and transparent lines of accountability.

The *Road to Zero* Strategy has been developed based on evidence-based modelling of interventions and is supported by a Road Safety Outcomes Framework. Whilst the framework is still to be finalised, the approach that has been adopted is outlined in Figure 23.

Figure 23 Structure of the Proposed Road to Zero 2030 Outcomes Framework



Investment Objectives and Key Performance Measures

The investment objectives and key performance indicators relating to the SIP are outlined in Table 5. These are draft and are currently being refined by Waka Kotahi and wider partners. The full range of draft KPI's for *Road to Zero* are provided in Section 5 of this PBC.

Table 5 Investment Objectives and Key Performance Indicators

Investment Objectives	Outcome Indicators
A reduction in death and serious injury crashes where speed and infrastructure are identified as a contributing factor (80%)	KPI 1: % of VKT on roads with speed limit above 80km/h that have a median barrier KPI 2: Number head-on and run-off-road DSIs KPI 3: Number of DSIs where the speed limit does not align with safe and appropriate speed KPI 4: % of road network where speed limits align with safe and appropriate speed
Timely delivery of safety improvements (20%)	KPI 1: Kilometres of the network treated with median barriers KPI 2: Kilometres of the network treated with reduced speed limits



Section three: *Road to Zero* development

Introduction

This section details the work that was undertaken to develop the *Road to Zero* DSI target and the expected contributions of each focus area.

Road to Zero Target Development

The *Road to Zero* Strategy was developed by the Ministry of Transport (MOT) and key stakeholders and did not follow a traditional business case approach to optioneering. However, a robust approach was undertaken to consider different DSI reduction targets and the mix of alternatives and options required.

In May 2019, the MOT submitted a briefing to Ministers detailing different *Road to Zero* target options for consideration. Included in the briefing was a one-page overview that set out the implications of different DSI reduction targets. In addition to the DSI savings for each option, the overview outlined the scale of effort and contributions from each focus area towards the achievement of each DSI reduction target. The overview is provided in Appendix A – DSI Reduction Options Considered for a 2030 Target and summarised in Table 6.

The scenarios considered by government were largely informed through modelling of various scales and mixes of interventions needed to achieve the different targets. The modelling takes account of projected economic conditions, demographic changes, and global factors such as petrol prices, and assumes that existing trends in the safety of the vehicle fleet, roads and user behaviour will continue to incrementally improve.

As shown in Table 6 the majority of gains, regardless of the desired target, are expected to come from investment in the SIP and enforcement. Increasing the safety rating of vehicles in the fleet would also contribute to a reduction in DSI's. The remaining contribution is expected to come from a range of other interventions that have not been modelled such as a reduction in drink driving, that are known to have an impact on road safety outcomes.

Do-Minimum

A business as usual or do-minimum approach to road safety is only expected to reduce DSI's by approximately ten percent by 2030. If safety improvements to roads, the vehicle fleet and behaviour continue in line with past interventions and activity levels, then in the year 2030, it is expected that there would be around 2,900 DSI's (a ten percent reduction on 2018 levels).

Adoption of the Forty Percent DSI Reduction Target

Public consultation on the *Road to Zero* Strategy was undertaken in 2019 and a total of 1,369 written submissions were received over four weeks of consultation. Almost 85 percent of those who submitted broadly supported the vision and 42 percent of submitters supported the proposed 40 percent DSI reduction target, with a further 34 percent seeking a more ambitious target.

Following public consultation Cabinet endorsed the 40 percent DSI reduction target and the *Road to Zero* Strategy in December 2019. Steady progress towards this target would mean approximately 750 fewer people would be killed and 5,600 fewer would be seriously injured on New Zealand roads over the next ten years, compared to current levels of harm. Doing so would reduce the total social cost of road crashes to New Zealanders by approximately \$9.6 billion. It would also have a significant impact on the long-term costs to ACC of road crashes. For comparison, the Western Australia road safety strategy also adopted a 40 percent DSI reduction target over ten years with 54 percent of the cumulative DSI reduction attributed to Safe Roads and Roadsides (infrastructure) and Safe Speeds, 26 percent attributed to Safe Vehicles and 20 percent attributed to Safe Road Use.

Table 6 Summary of the Options Considered for a 2030 Target (refer to Appendix A – DSI Reduction Options Considered for a 2030 Target for full overview)

Intervention Type	30 Percent Reduction (113 fewer deaths and 840 fewer serious injuries)	40 Percent Reduction (151 fewer deaths and 1,120 fewer serious injuries)	50 Percent Reduction (189 fewer deaths and 1,400 fewer serious injuries)	60 Percent Reduction (227 fewer deaths and 1,680 fewer serious injuries)
Infrastructure, Speed and Enforcement	<p>10-15 percent DSI reduction</p> <p>Safety spend of ~ \$7-8 billion over ten years (like current levels)</p> <ul style="list-style-type: none"> • ~ \$4 billion safety infrastructure • ~ \$3.85 billion enforcement • Speed regulatory changes 	<p>15-20 percent DSI reduction</p> <p>Safety spend of ~ \$9-10 billion over ten years (25 percent increase to current levels)</p> <ul style="list-style-type: none"> • ~ \$5 billion safety infrastructure • ~ \$4.1 billion enforcement • Speed regulatory changes 	<p>25-30 percent DSI reduction</p> <p>Safety spend of ~ \$11-12 billion over ten years (50 percent increase to current levels)</p> <ul style="list-style-type: none"> • ~ \$7 billion safety infrastructure • ~ \$4.6 billion enforcement • Speed regulatory changes 	<p>30-35 percent DSI reduction</p> <p>Safety spend of ~ \$12-13 billion over ten years (65 percent increase to current levels)</p> <ul style="list-style-type: none"> • ~ \$8 billion safety infrastructure • ~ \$4.6 billion enforcement • Speed regulatory changes
Vehicle Safety Improvements	<p>10-15 percent DSI reduction</p> <ul style="list-style-type: none"> • Increased safety requirements for new/used vehicles, equivalent to preventing 1- and 2-star vehicles from entering the fleet. • Antilock Braking Systems mandated for all new motorcycles from 2020 and used motorcycles entering the fleet from 2021. • Act where possible to reduce the number of less safe vehicles remaining in the fleet by 2030. 			
Other Interventions and Supporting Factors	<p>5-15 percent DSI reduction</p> <ul style="list-style-type: none"> • Mode shift to safer public transport, freight to rail and coastal shipping and corridor separation for active modes would have a positive impact on road safety over the next ten years, potentially increasing over the longer term, as well as delivering broader benefits. • Measures that reduce total vehicle kilometres travelled, including mode shift, can be expected to have a positive impact on road safety. • Improvements in technology, including active driver assistance in vehicles, vehicle automation and connected vehicle technologies. • A range of other initiatives, including strengthening work-related road safety, enforcement tools for drug driving, more effective penalties, and remedies for improvements to licensing, training, and education. 			

Road to Zero Intervention Hierarchy

The development of the alternatives and options follows the Safe System approach to road safety. A range of alternatives and options were considered to address the problems identified in this PBC. These interventions were informed from the inputs obtained via various subject matter expert workshops represented by the MOT, NZ Police, industry, and Waka Kotahi, primarily on the basis that:

1. Interventions are likely to have a significant impact on reducing serious road related trauma, i.e. a roughly five percent overall DSI reduction on their own, and
2. A sufficient evidence basis was available to allow the intervention to be modelled.

A modelling tool was developed to assess the different combination of interventions that could be delivered across all focus areas, to achieve the *Road to Zero* DSI reduction target. The Integrated Intervention Logic Model (IILM) uses relevant data and evidence-based research to estimate DSI savings based on a specific quantity of each chosen intervention working in synergy with other interventions (a systems-based approach).

It is important to look at the interventions as a package rather than individually, as many of the interventions work synergistically. For example, reducing speed limits is more effective if supported by enforcement and no single intervention is expected to significantly reduce DSI's alone.

The indicative analysis increased each intervention until the overall annual DSI savings approached a target of 40 percent DSI savings from current levels. An overview of the assumed uptake of each of the interventions within each of the *Road to Zero* focus areas is shown in Table 7. It is important to note that these assumptions were used to confirm that a 40 percent DSI reduction is feasible, rather than to determine the precise composition of the programme.

Table 7 Assumed Intervention Uptake Rates Based on IILM Outputs (percent)

Intervention Group	Intervention	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10
Speed and Infrastructure	Speed enf.	33	67	100	100	100	100	100	100	100	100
	Auto enf.	25	50	75	100	100	100	100	100	100	100
	Top 10%	33	67	100	100	100	100	100	100	100	100
	Median	10	20	30	40	50	60	70	80	90	100
	Intersections	10	20	30	40	50	60	70	80	90	100
	30km/h	25	50	75	100	100	100	100	100	100	100
Vehicles	M/C ABS	25	50	75	100	100	100	100	100	100	100
	1&2 Star	10	20	30	40	50	60	70	80	90	100
Safe Road Users	DUI enf.	100	100	100	100	100	100	100	100	100	100
	Alcolocks	10	20	30	40	50	60	70	80	90	100
Totals	DSI Savings	356	625	901	1,061	1,141	1,221	1,302	1,302	1,464	1,545
	Social Cost Savings \$ million	425	746	1,075	1,265	1,361	1,458	1,555	1,651	1,748	1,844

The modelling suggests that a 40 percent DSI reduction target is ambitious but achievable. Around half of the 40 percent target could be achieved through a combination of infrastructure improvements, speed limit changes in urban areas and on the highest risk parts of the network and increased speed enforcement.

Some of the assumptions may prove to be highly ambitious, such as the removal of 1- and 2-star vehicles from the New Zealand fleet by 2030. Without other measures such as tighter regulation and/or higher penalties, it is forecast that around 20 percent of the light vehicle fleet could still be 1- and 2-star by 2030. The modelling also assumes doubling of speed and alcohol enforcement. If these aspirations are not achieved, then other interventions such as infrastructure improvements and safety cameras would likely need to be scaled-up even further to make up the shortfall in DSI savings.



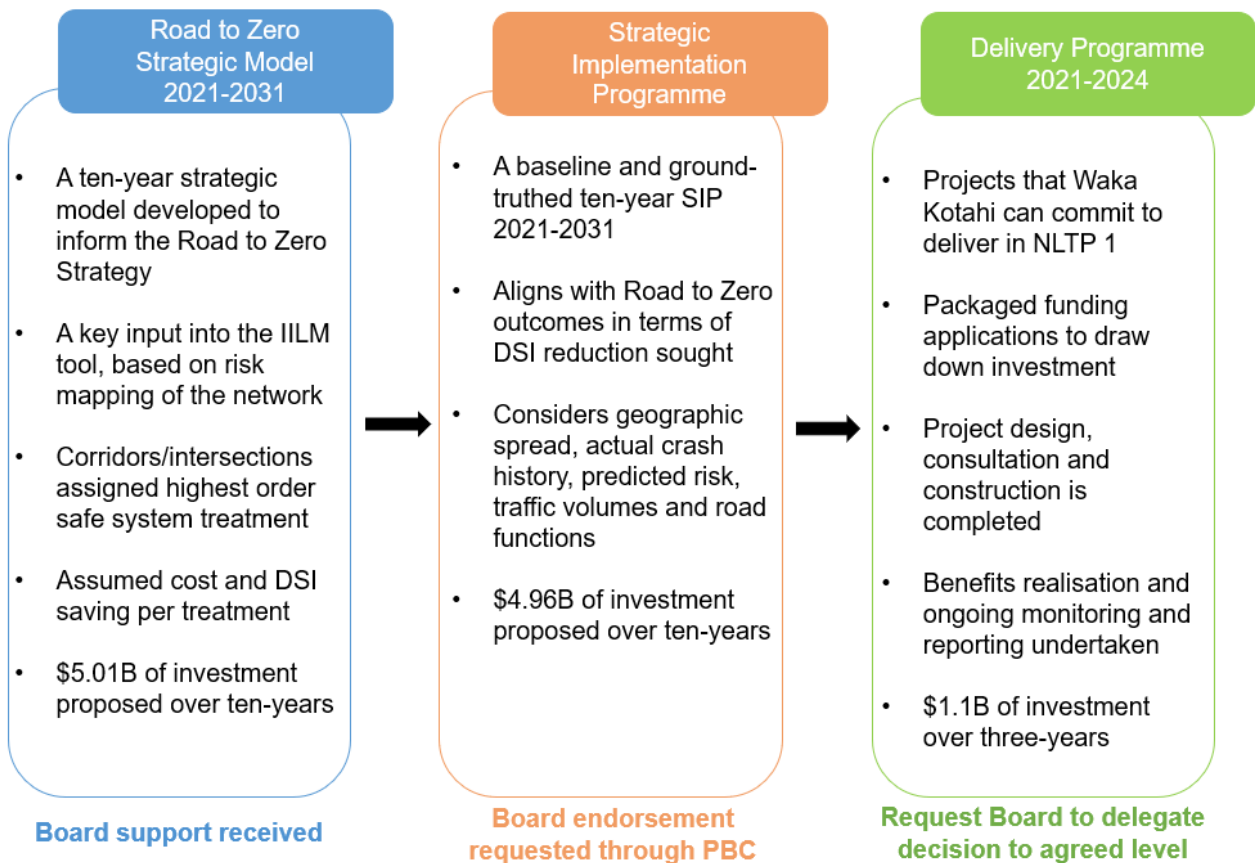
Section four: Speed and Infrastructure Programme

This section of the PBC is focused on the development and assessment of the SIP. It documents the following iterations of the programme:

- Ten-year Strategic Model (2021-30) that was used to inform the *Road to Zero* Strategy (2021-31)
- Ten-year Strategic Implementation Programme (2021-30) that outlines the scale of investment required over the next ten years to meet the *Road to Zero* outcomes.
- SIP Delivery Programme – the activities planned for inclusion in the 2021-24 NLTP is created that details the packages of projects that will be started in the 2021-24 period, based on GPS prioritisation and the available funding in the activity class.

A summary of the SIP iterations is provided in Figure 24. It is important to recognise that this PBC represents a point in time, and that the SIP is continuously refined through the project lifecycle.

Figure 24 Road to Zero Speed and Infrastructure Programme Iteration Overview



The work done to develop the Strategic Model was used in the *Road to Zero* Strategy and guided the conversation around what level of outcome was being sought from the SIP (as per Section 3). To develop the ten-year SIP, the Strategic Model was used as a basis but then developed further with local and regional insights to give a more refined programme called the Ten-Year Strategic Implementation Programme.

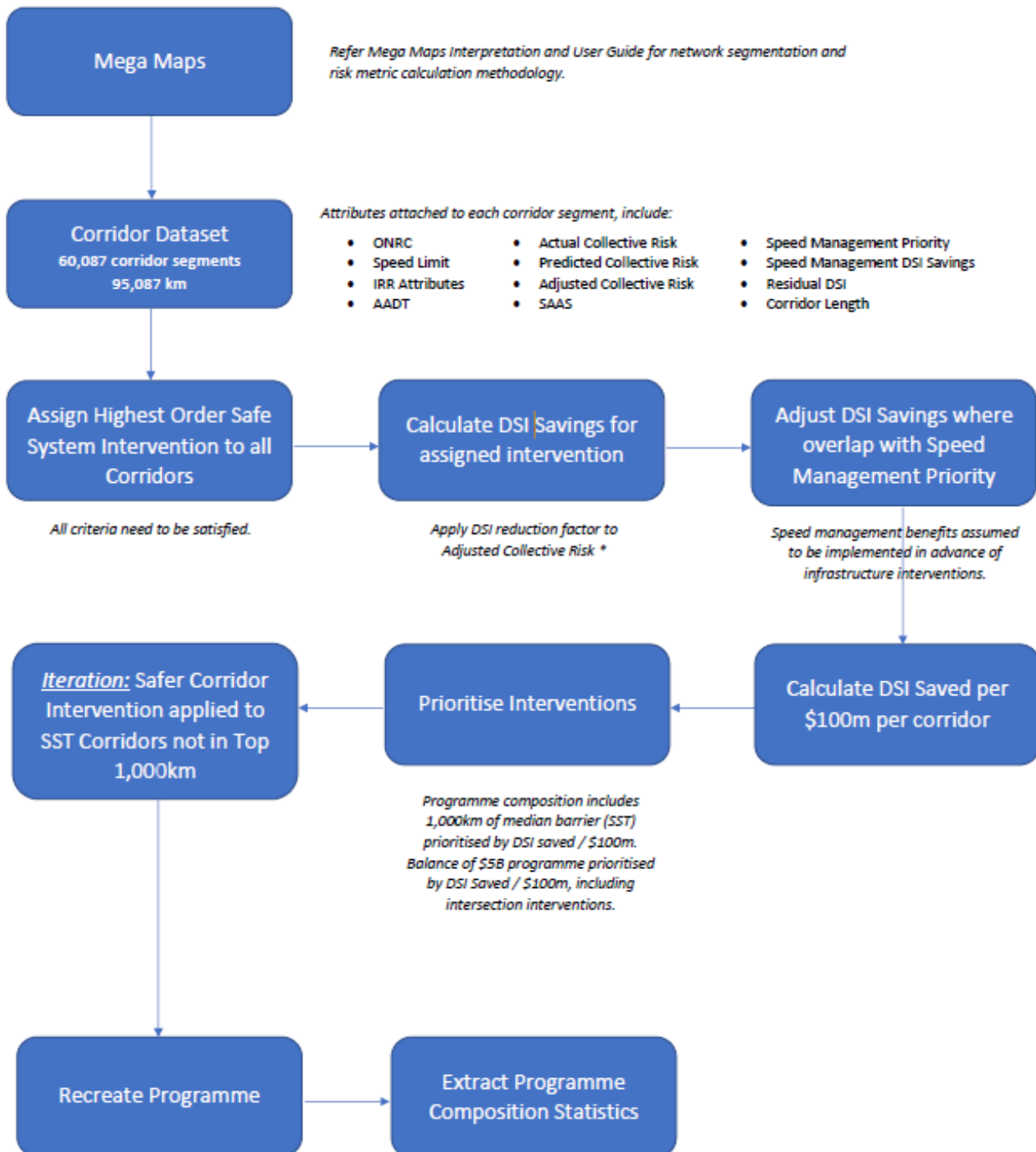
Road to Zero SIP Strategic Model 2021-31

The programme uses a national road safety dataset that sits behind the Safer Journeys Risk Assessment Tool, known as Mega Maps, which includes both state highways and local roads. A detailed overview of the methodology used to develop the *Road to Zero* SIP Strategic Model is provided in Appendix B – SIP Strategic Model Methodology.

Corridor Prioritisation and Treatments

Figure 25 provides an overview of the process that was undertaken to identify, assign and prioritise treatments for corridor improvements as part of the *Road to Zero* SIP Strategic Model.

Figure 25 Road to Zero: Development Process for Assigning and Prioritising Corridors



A hierarchical approach is applied to the assignment of interventions to a corridor as shown in Table 8. This means transformational treatment is considered first, such as a median barrier, then wide centreline, then rumble strips. If a corridor satisfies the criteria for 'Safe System Transformation' then it is ineligible for classification as 'Supporting Safe System Treatment' either medium or low cost.

One exception applies for corridors assigned with the 'Safe System Transformation' intervention where the estimated DSI's saved per \$100 million investment is low. In these instances, the corridor is also assessed with a 'Supporting Safe System Treatment (medium cost)' intervention. An iterative approach was used to determine the classification of a low return on investment.

Table 8 Rural Corridor Interventions

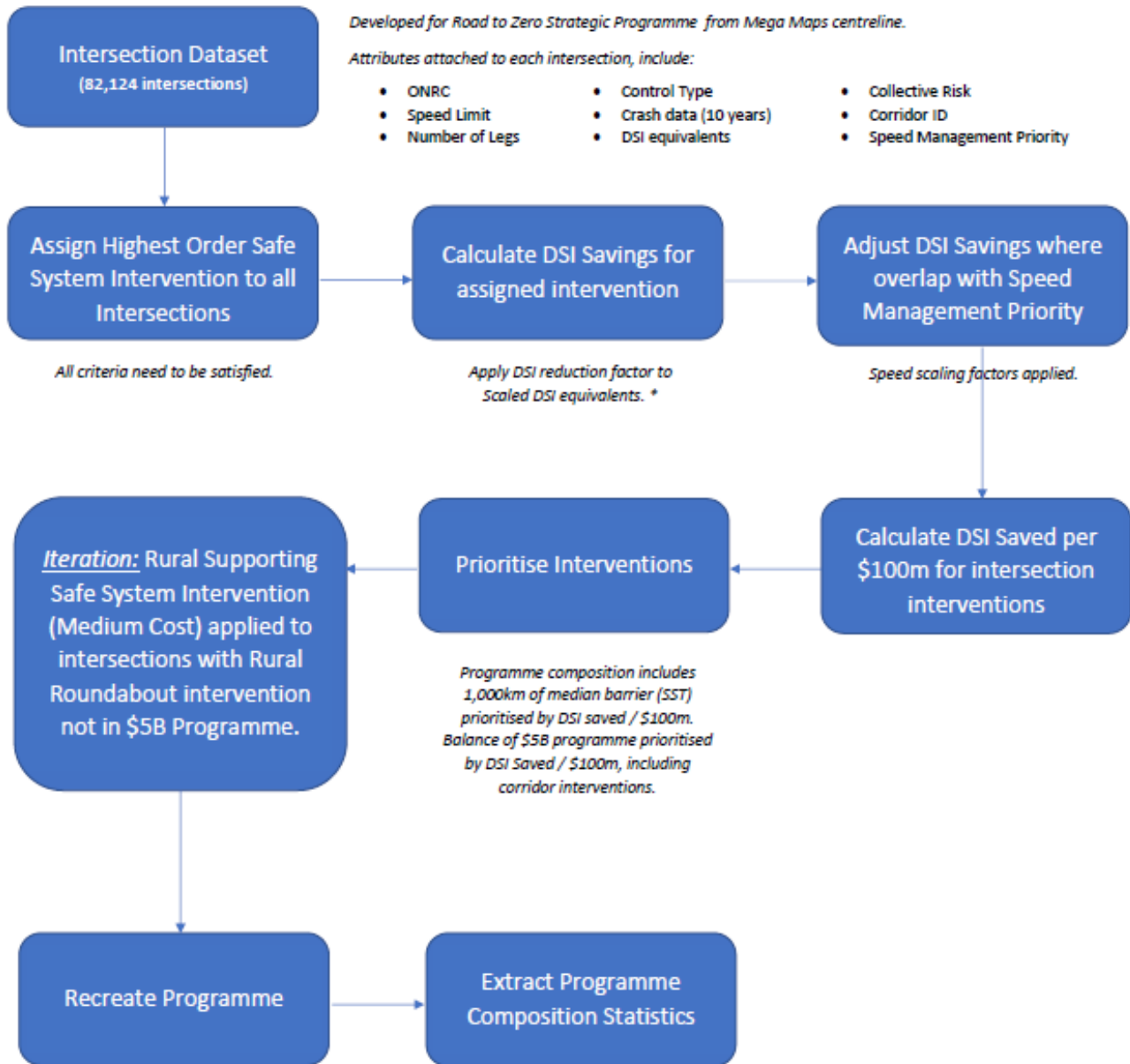
Treatment Philosophy	Criteria	Benefit Calculation	Cost ²²
<p>Safe System Transformation</p> <p>This includes a central wire rope median barrier system with side barrier where practicable. This is known as a 'Primary' Safe System intervention.</p>	<ul style="list-style-type: none"> • Corridor length > 2km • AADT > 6,000 vpd • Speed limit ≥ 80km/h • Road stereotype ≠ Divided – non traversable or Unsealed • Estimated or Predicted Collective Risk ≥ Medium-High 	65% DSI Reduction	\$2.6 million per km
<p>Supporting Safe System Treatment (medium cost)</p> <p>This includes wide centreline treatment, carriageway widening, roadside hazard removal/protection. This is known as a 'Supporting' Treatment, which moves towards better Safe System alignment and is compatible with the future implementation of Primary Safe System Treatments.</p>	<ul style="list-style-type: none"> • Corridor length > 2km • AADT > 3,000 vpd • Speed limit ≥ 80km/h • Road stereotype ≠ Divided – non traversable or Unsealed • Estimated or Predicted Collective Risk ≥ Medium 	30% DSI Reduction	\$1.25 million per km
<p>Supporting Safe System Treatment (low cost)</p> <p>This includes a range of measures that improve safety outcomes but do not materially change the IRR / Star Rating of the corridor. Interventions include audio tactile paving, enhanced delineation, improved surface friction etc. This is known as a 'Supporting' Treatment, which does not affect the future implementation of Primary Safe System Treatments.</p>	<ul style="list-style-type: none"> • Corridor length > 2km • Speed limit ≥ 80km/h • Road stereotype ≠ Unsealed • Estimated or Predicted Collective Risk ≥ Medium 	15% DSI Reduction Benefits calculated based on residual DSI after Top 10% GPS	\$0.4 million per km
<p>Top 10% GPS High Benefit Speed Management</p>		Nilsson's Power Model	Maximum \$100,000 per corridor / \$20,000 per km.

²² Includes maintenance costs

Intersection Prioritisation and Treatments

Figure 26 provides an overview of the process that was undertaken to identify, assign and prioritise treatments for intersection improvements as part of the *Road to Zero* SIP Strategic Model.

Figure 26 Road to Zero: Development Process for Assigning and Prioritising Intersections



A hierarchical approach is also applied to the assignment of interventions to an intersection as shown in Table 9. As with corridors, an exception to this rule is applied to intersections assigned with the 'Rural Safe System Transformation' intervention where the estimated DSI saved per \$100 million investment is low.

In these instances, the intersection is also assessed with a 'Rural Supporting Safe System Treatment (low cost)' intervention.

Table 9 Intersection Treatments

Treatment Philosophy	Criteria	Benefit Calculation ²³	Cost ²⁴
<p>Rural Safe System Transformation</p> <p>This intervention includes the upgrade of a priority-controlled intersection to a roundabout. This is known as a 'Primary' Safe System treatment.</p>	<ul style="list-style-type: none"> • Speed limit ≥ 80km/h • Intersection Type ≠ roundabout • Collective Risk ≥ Medium • GHJKLN injury crashes ≥ 3 in last 10 years 	70% DSI Reduction	\$3.3 million per site
<p>Rural Supporting Safe System Treatment (medium cost)</p> <p>This intervention includes improvements to existing roundabouts through design enhancements or speed management measures, such as raised platforms. This is known as a 'Supporting' Treatment, which does not affect the future implementation of Primary Safe System Treatments.</p>	<ul style="list-style-type: none"> • Speed limit ≥ 80km/h • Intersection Type = roundabout • Collective Risk ≥ Medium-High 	40% DSI Reduction	\$0.5 million per site
<p>Rural Supporting Safe System Treatment (low cost)</p> <p>This intervention is based on treatments such as Vehicle Activated Stop Signs, provision of turning bays, improved visibility. This is known as a 'Supporting' Treatment, which does not affect the future implementation of Primary Safe System Treatments.</p>	<ul style="list-style-type: none"> • Speed limit ≥ 80km/h • Intersection Type is priority controlled • GHJKLN injury crashes ≥ 2 in last 10 years 	35% DSI Reduction	\$0.33 million per site
<p>Urban Safe System Transformation</p> <p>This intervention includes the upgrade of a priority-controlled intersection to a roundabout. This is known as a 'Primary' Safe System treatment.</p>	<ul style="list-style-type: none"> • Speed limit ≤ 70km/h • Intersection Type is priority controlled • Collective Risk ≥ Medium • GHJKLN injury crashes ≥ 3 in last 10 years • All legs have ONRC > Access • Number of legs ≥ 4 	60% DSI Reduction	\$1.65 million per site
<p>Urban Supporting Safe System Treatment (medium cost 1)</p> <p>This intervention includes improvements to existing roundabouts through design enhancements or speed management measures, such as raised platforms. This is known as a 'Supporting' Treatment, which does not affect the future implementation of Primary Safe System Treatments.</p>	<ul style="list-style-type: none"> • Speed limit ≤ 70km/h • Intersection Type = roundabout • Collective Risk ≥ Medium-High 	40% DSI Reduction	\$0.5 million per site

²³ Benefits adjusted by applying a DSI speed scaling factor for intersections situated on corridors in the Top 10% GPS

²⁴ Includes maintenance costs

Treatment Philosophy	Criteria	Benefit Calculation ²³	Cost ²⁴
<p>Urban Supporting Safe System Treatment (medium cost 2)</p> <p>This intervention includes upgrading a signalised intersection on a raised platform to control vehicle entry speeds. The intervention may or may not be supplemented by modifications to signal phasing to fully control right-turn movements. This is known as a 'Primary' Safe System treatment.</p>	<p>For platforms</p> <ul style="list-style-type: none"> • Speed limit ≤ 70km/h • Intersection Type ≠ roundabout • GHJKLN injury crashes ≥ 3 in last 10 years • Collective Risk ≥ Med <p>For right-turn filter removal</p> <ul style="list-style-type: none"> • Intersection Type is signals • Right turn against crashes > 20% of all crashes • Right turn against crashes ≥ 3 in last 10 years • Collective Risk ≥ Med 	<p>40% DSI Reduction</p> <p>35% DSI Reduction</p>	<p>Platforms</p> <ul style="list-style-type: none"> • \$0.44 million per site <p>For right-turn filter removal</p> <ul style="list-style-type: none"> • \$0.20 million per site. No additional costs assumed
<p>Urban Supporting Safe System Treatment (low cost)</p> <p>This intervention includes removing all right turn movements at a priority-controlled T-intersection where the side road has the lowest mobility function i.e. access classification. This is known as a 'Supporting' Treatment, which moves towards better Safe System alignment and is compatible with the future implementation of Primary Safe System Treatments.</p>	<ul style="list-style-type: none"> • Speed limit ≤ 70km/h • Intersection Type is priority controlled • Intersection Form is T 3-leg • Priority leg ONRC ≥ Arterial • Side road ONRC = Access • GHJKLN injury crashes ≥ 2 in last 10 years 	<p>60% DSI Reduction</p>	<p>\$0.25 million per site</p>

Based on the preceding analysis, various programme compositions were explored to inform the final SIP Strategic Model. The key outputs identified from the SIP Strategic Model include:

- 10,000 kms of road corridor across New Zealand treated with some form of speed management over the next ten years, including:
 - 1,000 kms of road corridor treated with median barriers
 - 1,900 kms of road corridor safety improvements such as side barriers and rumble strips
 - 4,700 kms of road corridor treated with speed management and an additional 2,400 kms treated with speed management to address the top ten percent of the network
- 1,400 intersection improvements such as roundabouts and raised safety platforms
- 900 supporting safe system intersection improvements.

Table 10 Road to Zero Ten Year SIP Strategic Model Local Roads and State Highways (rounded)

Feature	Intervention	Number / Length (km)	DSI Saved	Cost ²⁵
Corridors	Corridors treated with median barriers (Includes supporting measures such as rumble strips and roadside barriers at high risk locations)	1,000 km	129	\$2.6 billion
	Road corridor safety improvements²⁶ (e.g. wide centreline, roadside barriers, rumble strips)	1,900 km	195	\$930 million
	Road corridor speed only	4,700 km	93	
	Sub Total	7,600 km	417	\$200 million
				\$3.73 billion
Intersections	Safe System intersection improvements (e.g. roundabouts or raised safety platforms)	1,400	165	\$1.01 billion
	Intersection safety improvements (e.g. intersection speed zones, turning bays, improved visibility, removal of right turn movements)	900	53	\$270 million
	Sub Total	2,300 int.	218	\$1.28 billion
Road to Zero Strategic Model Programme			635	\$5.01 billion
Additional	Additional corridors with speed only to cover top ten percent of the network	2,400 km	TBC	\$50 million
Total corridors		10,000 km		

Key metrics associated with the SIP Strategic Model programme are:

- 64 percent of investment is on the state highway network, 36 percent on local road networks
- 56 percent of the DSI savings are on the state highway network and 44 percent on local road networks
- 11 DSI's expected to be saved per \$100 million for state highways and 15 on local road networks
- 64 percent of the corridors treated by length are on the state highway network, 36 percent local roads
- 26 percent of intersections treated are on the state highway and 74 percent are on local road networks.

The IILM is a modelling tool and is based on a set of assumptions, including interventions, costs and estimated DSI reduction, which have been refined as summarised in the next section.

²⁵ Cost provided to nearest \$5 million

²⁶ Assumes supporting speed limit review on all but 200 km if Safety Management corridor

SIP Strategic Implementation Programme

Context

The SIP Strategic Implementation Programme provides key details of projects required for inclusion in Long Term Plans, RLTP's, the NLTP, and the Waka Kotahi Investment Proposal (WKIP), including location, timing, intervention, cost, and DSI reduction over the ten-year period of the *Road to Zero* Strategy.

Further work has been undertaken to refine and ground-truth the SIP Strategic Model to develop the SIP Strategic Implementation Programme, which covers both state highways and local roads. The Strategic Implementation Programme consists of two views:

- Strategic Implementation Programme (ten-year baselined programme for 2021-30) focussed on outcomes and outlines the scale of investment required over the next ten years to meet the *Road to Zero* outcomes
- SIP Delivery Programme – the activities planned for inclusion in the 2021-24 NLTP is created that details the packages of projects that will be started in the 2021-24 period, based on GPS prioritisation and the available funding in the activity class.

Ten-Year SIP Strategic Implementation Programme Development

This section begins by outlining the ten-year Strategic Implementation Programme, followed by the SIP Delivery Programme.

The complexity in the development of the SIP Strategic Implementation Programme is achieving a balance between early delivery, achieving the targeted reductions in DSIs, and available *Road to Zero* activity class funding. Both iterations of the SIP Strategic Implementation Programme are summarised in this section of the PBC.

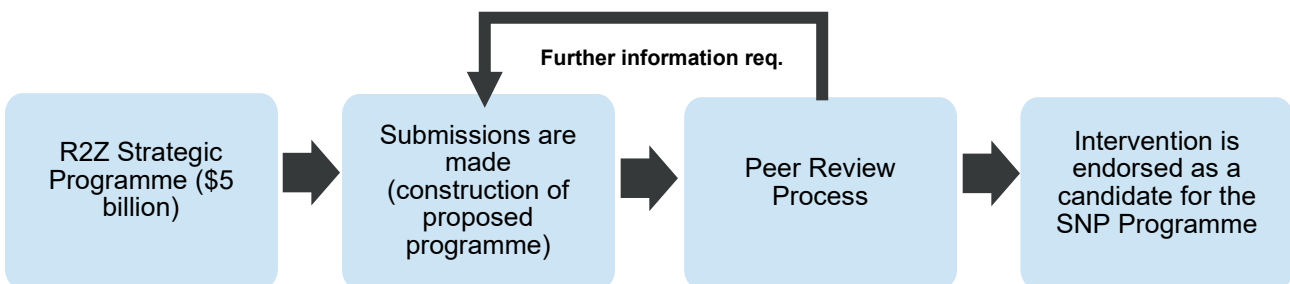
The SIP Strategic Implementation Programme is developed based on input from local authorities and Waka Kotahi regional teams. Through a series of workshops and conversations, the conceptual SIP Strategic Model is “ground truthed” or validated to:

- Enable a geographic spread of investment throughout New Zealand
- Target risk by taking account of actual crash history alongside predicted risk, traffic volumes and the form and function of roads

A Pipeline Tool is used to document the SIP Strategic Implementation Programme. An element of over-programming has been included, so that outputs such as length of median barrier are delivered. At this level of programming, it is difficult to ascertain the length of median barrier that will be delivered, and length of corridor is used as a proxy instead. Whilst state highway and local road programmes are initially developed separately, both programmes have been combined to consider performance against the *Road to Zero* targets.

The approach used to develop the ten-year SIP Strategic Implementation Programme for state highways and local roads is shown in Figure 27.

Figure 27 Methodology for the Development of Implementation Programmes



The use of the Pipeline Tool has made a significant contribution to Local Authorities and the development of their local roads programme as well as the state highway programme. This is partly due to the information within the tool but more importantly how the tool has helped consider network priorities and test interventions. The Pipeline Tool is considered an integral part of programme development for the SIP and beneficial as a communication tool with Local Authorities and Waka Kotahi.

Ten-Year SIP Strategic Implementation Programme for State Highways and Local Roads

The ten-year SIP Strategic Implementation Programme for state highways and local roads comprises of safety infrastructure improvements and speed management projects across New Zealand valued at \$4.96 billion. This iteration of the SIP would reduce DSI's by 565 per annum by 2030, as shown in Table 11.

Funding of the \$4.96 billion recommended programme for Speed and Infrastructure improvements over 2021-30 is shared between Waka Kotahi and local authorities (\$3.47 billion and \$1.49 billion respectively). To meet the 2030 target, delivery of the programme needs to start as close to 1 July 2021 as possible to maintain delivery momentum.

Table 11 SIP Strategic Implementation Programme Across State Highway and Local Roads

Feature	Intervention	Number / Length (km)	DSI Saved	Cost ²⁷
Corridors	Corridors treated with median barriers (Includes supporting measures such as rumble strips and roadside barriers at high risk locations)	854 km	73	\$1.25 billion
	Road corridor safety improvements²⁸ (e.g. wide centreline, roadside barriers, rumble strips)	4,448 km	111	\$1.17 billion
	Road corridor speed only	17,286 km	152	
	Sub Total	22,588 km	336	\$355 million
				\$2.78 billion
Intersections	Safe System intersection improvements (e.g. roundabouts or raised safety platforms)	760	72	\$831 million
	Intersection safety improvements (e.g. intersection speed zones, turning bays, improved visibility, removal of right turn movements)	957	45	\$296 million
	Sub Total	1,717 int.	117	
				\$1.12 billion
Committed	Local roads		24	\$180 million
	State highways		88	\$879 million
Total	Road to Zero Strategic Implementation Programme		565	\$4.96 billion

²⁷ Cost provided to nearest \$5 million

²⁸ Assumes supporting speed limit review on all but 200 km if Safety Management corridor

When reviewing the ten-year Strategic Implementation Programme against the Strategic Model Programme, there is an increase in 'road corridor speed only' interventions proposed in the Strategic Implementation Programme for 17,286 kms, compared with 4,700 km in the Strategic Model Programme. This increase on both the state highway and local road networks is proposed to offset a reduction in the number of 'safe system intersection improvements' proposed, that are predominantly on urban local road networks. The 'safe system intersection improvements' proposed has reduced from 1,400 to 760 over the ten-year period. This reduction in intersection improvements is as a result of several factors, including a lack of local funding in a post Covid-19 environment and the level of comfort and the ability of local authorities to deliver the number of intersection improvements sought by *Road to Zero*.

Despite these changes the ground-truthing exercise has demonstrated that the ten-year SIP Strategic Implementation Programme is still expected to achieve close to the desired DSI reductions (565 as opposed to 635 in the Strategic Model). Further work will be undertaken through the programme implementation phase to increase the local road outputs, in particular urban intersection improvements. All efforts will be made to further develop the programme and pursue opportunities to achieve the necessary outcome / target or better as implementation progresses, through for instance, prioritising Primary Safe System physical interventions such as median barriers and roundabouts as well as developing innovative design and implementation approaches that enable more efficient progress.

An annual check-in of the programme will be undertaken, and the programme will be re-visited every three years and refinements made if required, to meet the *Road to Zero* outcomes. This will be aligned to portfolio and programme management controls outlined in the Management Case.

It is also important to note that:

- The Strategic Model assumed an even distribution or rollout of the programme over the ten years. Implementation will now occur at different rates, based on available funding (for state highways and local roads) and activity class levels. Due to COVID 19 some capital expenditure has been deferred in NLTP 1 which has resulted in more capital projects and funding required in the following two NLTP periods to achieve the *Road to Zero* outcomes.
- The ten-year Strategic Implementation Programme outlines a larger programme than the Strategic Model, because of over-programming by approximately 20 percent within the state highway programme to allow for natural attrition of projects within the programme.
- The larger funding requirements within the ten-year Strategic Implementation Programme includes safe system transformation projects, such as median barriers as these provide the highest DSI returns and ability to achieve the *Road to Zero* outcomes.
- Whilst it appears that the Strategic Implementation Programme is proposing a 'road corridor speed only' intervention on a significant length of the network, it should be noted that currently 87 percent of the network does not have a safe and appropriate speed relative to its function, design and use. Speed management projects have also been front loaded into the programme and is a major focus for the local roading and state highway programme.
- There is a greater proportion of safer corridor type projects in the Strategic Implementation Programme than the Strategic Model assumed. This is in part due to the completion of currently committed projects.
- Local authorities are currently in the process of finalising their Long-Term Plans and their safety programmes. These safety programmes, which are included in the overall SIP, are responding to each local authority's current financial situation.
- The SIP will require ongoing monitoring to confirm that outcomes and outputs are being delivered. It is expected that, with continuing support for local authorities in the capability and capacity areas, as well as

possible incentivisation (financial or otherwise) to encourage the further implementation of transformational safety improvements, there will be scope to deliver more DSI reductions over time.

SIP Delivery Programme

This section of the SIP PBC details the proposed 2021-24 SIP for both state highways and local roads. This programme is still under-development and will be continuously refined as local road partners refine and develop their Long-Term Plans. The draft programme detailed in this section is based on indicative activity class funding levels for the 2021-24 period.

SIP Delivery Programme Development

Through the programme development process, SIP have developed a list of endorsed interventions for consideration for investment for NLTP 2021-24 by Waka Kotahi. From the ten-year SIP Strategic Implementation Programme, the Delivery Programme is created which comprises of the first three years of projects that start in the 2021-24 period.

The current approach led to a fragmented delivery programme and to combat this less efficient delivery format the team is using a 'packaging approach' to group treatments and/or interventions into corridor or location specific implementation plans for investment and planning activities. It outlines how packages of projects are refined through the delivery phase of the programme lifecycle. This includes project establishment, feasibility, design, construction and benefit realisation and monitoring.

SIP Delivery Programme for State Highways 2021-24

The composition of the 2021-24 SIP for state highway is shown in Table 12.

Table 12 SIP 2021-24 Delivery Programme for State Highways

Feature	Intervention	Number / Length (km)	DSI Saved
Corridors ²⁹	Corridors treated with median barriers (Includes supporting measures such as rumble strips and roadside barriers at high-risk locations)	384 km	61
	Road corridor safety improvements (e.g., wide centreline, roadside barriers, rumble strips)	1,429 km	30
	Road corridor speed only	3,146 km	90
Intersections ²⁹	Intersection improvements	5	4
Packages	Multiple intervention types	7	3
Cost	Funding Approved	\$235 million	
	New Funding	\$849 million	
	Total	\$1.08 billion	

SIP Delivery Programme for Local Roads 2021-24

An overview of the 2021-24 SIP for local roads is shown in Table 13. It is important to note that local authorities are still developing their Long-Term Plans and therefore the data shown below is based on the latest indicative

²⁹ Excludes items in 'packages'

programme as extracted from the Transport Investment Online (TIO) system on 1 December 2020 and is displayed by region.

Table 13 SIP 2021-24 Delivery Programme for Local Roads

Region	Delivery Programme (as at 1/12/2020)
Auckland	\$192 million
Bay of Plenty	\$17.9 million
Canterbury	\$64 million
Gisborne	\$750,000
Hawke's Bay	\$15.8 million
Manawatu – Wanganui	\$25 million
Northland	\$19.9 million
Southland	\$18.5 million
Taranaki	\$5 million
Top of the South	\$15 million
Waikato	\$59.3 million
Wellington	\$39.3 million
West Coast	\$3.5 million
Westland / Otago	\$37.8 million
Total	\$514 million

An overview of the NLTF funding allocation required for the 2021-24 Delivery Programme is shown in Table 14. The programme assumes that to mitigate the risk of a lower rate of delivery, over-programming is required to maintain the target delivery rate for the highway programme across ten years. The first three years of the Programme is estimated to cost \$1.6 billion which includes this over-programming as well as already committed activity; leaving \$1.1 billion to be sought from the 2021-24 NLTP.

Table 14 SIP NLTF Funding Allocation Required 2021-24 Delivery Programme

Programme Description	NLTP 2021-24 Totals	NLTF 2021-24 Allocation
Highway Programme New Initiatives	\$492 million	\$492 million
Highway Programme Funding Approved Phases (carried forward from 2018-21)	\$235 million	\$0
Highway Programme Draft Phases on In-Flight Initiatives (currently non-funded phases for committed projects)	\$357 million	\$357 million
Local Programme New (50 percent Funding Assistance Rate)	\$514 million	\$257 million
Total	\$1.6 billion	\$1.1 billion

Current indications are that funding for the first three years will fall short of required funding levels. This will have a significant impact on the ability of the SIP to contribute towards the 40 percent DSI reduction outcome with current estimates indicating that this could be reduced to 30 percent. The SIP would need to ramp up in the subsequent NLTP periods however, this does create greater risk in achieving delivery by the 2030 target date as well as losing the opportunity for early wins.

Economic Evaluation

The economic appraisal of the SIP Strategic Model and the ten-year Strategic Implementation Programme has been undertaken by Abley Limited in accordance with the Waka Kotahi Economic Evaluation Manual (EEM) and this work predates the introduction of the Monetised Benefits and Costs Manual.

Economic Methodology

For the SIP PBC Abley has developed a methodology for calculating programme level BCR's based on an approach that considers travel time and vehicle operating cost changes in the context of a Corridor Safe and Appropriate Speed (do-minimum) and an Intersection Safe System Speed (do-minimum) i.e., the safe and appropriate speed or the safe system speed is assumed as part of the do-minimum or base case scenario.

For example, if the posted speed limit on a rural state highway is 100km/h, but the safe and appropriate speed is assumed to be 80km/h, then 80km/h is assumed as the do-minimum or base case in the economic analysis.

If the safety improvement (e.g., median barriers), increases the safe and appropriate speed to 100km/h then the travel time and vehicle operating cost savings associated with the treatment are assumed to be realised because of the safety improvement.

A similar approach has been used for intersections. For example, if the posted speed limit at an urban intersection is 50km/h then this is reduced in the do-minimum or base case scenario to the safe system speed (30km/h assumed for all urban intersections where vulnerable road users such as pedestrians and cyclists are generally present).

If the safety improvement (e.g., traffic signals), increases the safe speed to 50km/h then the travel time and vehicle operating cost savings associated with the treatment are assumed to be realised because of the safety improvement.

This methodology complies with the Waka Kotahi EEM, which notes:

“Where a Road Controlling Authority decides to introduce one or more interventions to address unacceptable levels of collective and/or personal risk, to re-set the speed limit, and/or to manage speeds on a particular piece of road, the do minimum can include benefits and costs of implementing a new safe and appropriate operating speed”

Based on this guidance, any road safety proposal for a corridor which is not classified as a Safe System Transformation is assigned zero travel time and vehicle operating cost changes. This assumes that the posted speed limit proposed (whether higher, lower, or the same as the current posted speed limit) will achieve a safe and appropriate operating speed for any activity which is not classified as a Safe System Transformation.

Any road safety proposal classified as a Safe System Transformation is assessed against DSI reduction, travel time changes and vehicle operating cost changes.

A detailed overview of the methodology applied is provided in the technical note in Appendix C – BCR Sensitivity Test Methodology.

Economic Analysis

The results of the economic analysis for the ten-year SIP Strategic Model are summarised in Table 15.

Table 15 Ten-year Strategic Model Economic Analysis (rounded)

Feature	DSI's Saved ³⁰	Programme	Investment	BCR (excl. TT+ VOC)	BCR (inc. TT + VOC)
Corridors	417	State Highway	\$2.79 billion	1.3	1.9
		Local Road	\$944 million	1.9	2.2
Intersections	218	State Highway	\$368 million	4.3	4.5
		Local Road	\$909 million	3.7	3.6
Total	635		\$5.01 billion	2.1	2.5

The economic analysis for the SIP Strategic Model indicates that the Programme is expected to achieve an overall BCR of between 2.1 to 2.5. Table 15 also shows an expected DSI reduction of 635 per annum.

An economic appraisal of the SIP ten-year Strategic Implementation Programme has also been undertaken as summarised in Table 16. Note the below summary excludes committed projects and the Auckland Transport speed management programme, as these sites are not currently entered into the pipeline tool.

Table 16 Ten-year Strategic Implementation Programme Economic Analysis (rounded)

Feature	Programme	Investment	BCR (excl. TT+ VOC)	BCR (inc. TT + VOC)
Corridors	State Highway	\$2.14 billion	2.3	2.1
	Local Road	\$427 million	2.9	2.9
Intersections	State Highway	\$461 million	1.7	1.7
	Local Road	\$666 million	2.1	2.0
Total		\$3.69 billion	2.3	2.1

The economic analysis for the SIP Strategic Implementation Programme indicates that the Programme is expected to achieve an overall BCR of between 2.1 and 2.3.

Recommended Programme Assessment (IPM)

The recommended strategic SIP has been assessed against the Waka Kotahi draft Investment Prioritisation Method (IPM) 2021-24 requirements. This assessment and prioritisation framework reflects the GPS 2021-24 (for land transport) priorities for safety.

The Investment Prioritisation Method for 2021–24 NLTP has three factors:

- GPS Alignment
- Scheduling
- Efficiency

Each of the factors for the strategic SIP is outlined below.

³⁰ Per annum

GPS Alignment

GPS alignment indicates the alignment of a proposed activity or combination of activities (e.g. programmes or packages) with a GPS strategic priority and identifies the potential contribution to achieving the GPS strategic priority.

For the strategic SIP the GPS strategic priority of safety has been considered. A rating of **Very High** alignment is considered appropriate for the programme, as it seeks to target medium high or high collective risk corridors and intersections to achieve a DSI reduction of at least 40 percent. The programme also seeks to address DSI's in areas of High Concern.

Scheduling

Scheduling indicates the criticality or interdependency of the proposed activity or combination of activities with other activities in a programme or package or as part of a network. At a programme level the strategic SIP is considered to align with a **High** rating.

This rating has been applied to the programme due to its scale, which impacts both state highway and local road corridors and intersections nationwide. The programme therefore impacts several users and has a high degree of interdependency with other activities.

Efficiency

Efficiency indicates expected return on investment and considers the whole life costs and benefits through cost-benefit analysis. The Efficiency factor looks at monetised impacts, generally using the Benefit-Cost Ratio (BCR). The BCR for the strategic SIP is between 2.1 to 2.5, so an efficiency rating of **Low** has been applied.

Determining the Overall Priority

Investment prioritisation is the basis for including an activity or combination of activities in the NLTP. Depending on the amount of funding available for an activity class, activities with a priority order above an investment threshold in that activity class are included in the NLTP. The Waka Kotahi Board sets the investment threshold based on the funds available for the activity class and the value and priority order of all proposed activities.

Investment activities are assigned a priority order (1 high priority to 12 lowest priority) using each of the three prioritisation factors (GPS Alignment, Scheduling and Efficiency) using the Waka Kotahi Matrix for Improvement Activities.

The *Road to Zero* strategic SIP has been assigned an overall **investment priority score of 2**.

Section five: Speed and infrastructure management case

Introduction

Note: The Management Case outlined below was developed in 2020; therefore, some of the information and recommendations may be superseded by the new Transport Services Operating Model which is currently being undertaken by Waka Kotahi Transport Services Group. The sections below reflect either specific recommendations that are still relevant or where the outcome is still sought from the proposed change but the approach to achieving this may be achieved by a different mechanism subsequent to the new Transport Services Operating Model coming into effect imminently.

This section provides a roadmap for developing and implementing the *Road to Zero* SIP, including how Waka Kotahi will address the delivery and management issues identified in Problem Statement two:

The planning, investment and delivery of road safety improvements does not effectively support the delivery of large programmes of improvements with a high number of capital works, this limits our ability to continuously improve customers' safety in a timely manner and on a large scale.

A key challenge for the next NLTP period (2021-24) is the ability of the SIP to deliver at the scale and pace required to meet the *Road to Zero* desired outcomes from the SIP. This section outlines how Waka Kotahi will work with partners and streamline current processes to deliver a significant reduction in DSI's and value for money. The Management Case of this PBC considers improvements to the following areas of the *Road to Zero* SIP:

- **Portfolio, Programme, Project Management Approach**

Outlines how the outcomes sought by the *Road to Zero* Strategy will be delivered utilising the Portfolio, Programme and Project management approach (P3M3).

- **Programme Governance Required**

Efficient governance speeds up approvals – it provides clearer strategic direction and is able to make the trade-offs required. This section documents the broader governance arrangements for *Road to Zero* and outlines how the SIP Governance Group fits within the wider *Road to Zero* Portfolio Governance Group. Noting that the roles and responsibilities documented in this section may be superseded by the new Transport Services Operating Model which is currently being undertaken by Waka Kotahi Transport Services Group.

- **Communications and Engagement**

The programme requires both a strategic communications approach and strong engagement foundation with stakeholders and communities. This section details the public awareness campaign that Waka Kotahi is developing through a separate business case, to lift the public understanding of the *Road to Zero* approach.

- **Partnerships with Local Authorities**

A true partnership approach to deliver the ten-year *Road to Zero* SIP will require a significant lift in the capacity and capability of all the delivery partners. This PBC recommends that further work is required to incentivise local council investment to support the right size and timing of interventions. The PBC also recommends that a centre of excellence is developed to enable the effective and efficient delivery of road safety improvements, alongside local authority partners.

- **More Efficient Investment Approval**

Funding uncertainty stalls momentum and every day saved in the investment stages is five days of construction time saved. The PBC recommends that a packaging approach is adopted to provide efficiency gains in the

funding and approval process. Changes to the current SSI Pathway Approval Process are also proposed to streamline decision making, whilst retaining the independence of the National Manager Programme and Standards and the CFO. Noting that the roles and responsibilities documented in this section may be superseded by the new Transport Services Operating Model which is currently being undertaken by Waka Kotahi Transport Services Group.

- **Deliver Capability and Capacity**

Meeting the demand set above will require new procurement and delivery models and an increase in the understanding of the safe system in the sector. The PBC notes that the scale of investment proposed is significant but is considered achievable, albeit at the upper limit of deliverability. It is recommended that capability and capacity will be an ongoing workstream that will need to be reviewed at the end of each NLTP period to align resourcing with the expected activity class funding level and the proposed delivery programme in each NLTP period.

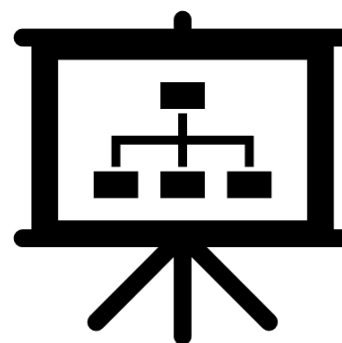
- **Realisation through Benefits and Monitoring**

Measuring performance in achieving the *Road to Zero* target. The PBC documents the current *Road to Zero* Outcomes Framework and indicators related to the SIP. Noting that these are currently being reviewed and refined by a working group made up of Waka Kotahi and MOT. The PBC recommends that work is progressed to align these key performance indicators with reporting that is undertaken by Road Controlling Authorities. A review of the current 2018-21 SNP has been undertaken, alongside a series of workshops and discussions with staff from the SNP and SIP teams and stakeholders within Waka Kotahi to identify the proposed improvements to the delivery of the 2021-24 SIP. An overview of the current state and the improvements proposed are documented under each of the above headings in the section that follows.

Portfolio, Programme, Project Management Approach

The outcomes sought by the *Road to Zero* Strategy are best delivered utilising the Portfolio, Programme and Project management approach or P3M3.

P3M3 (also known as the Portfolio, Programme and Project Management Maturity Model) is a management maturity model that looks at the whole system and not just at the processes.

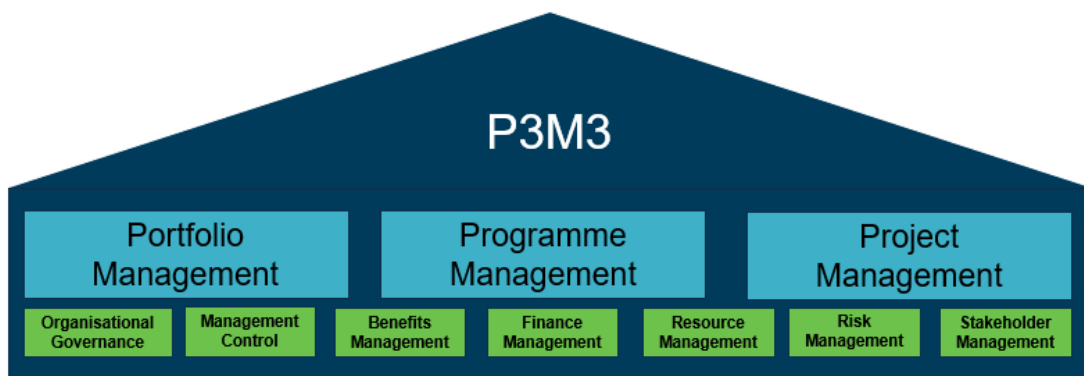


Waka Kotahi Portfolio Management Approach

Portfolio – a permanent entity representing the totality of an organisation’s investment (or part thereof) in the changes required to achieve its strategic objectives. Portfolio management involves:

- Where to invest in new initiatives
- Whether or not to invest in new initiatives
- How to enable efficient and effective delivery
- How to maximise the return on investment

P3M3 assesses the seven perspectives against portfolio best practice and expects organisational functions such as HR, Finance, Strategy, Risk and Governance to be embedded and linked to a portfolio. A portfolio can have sub-portfolios across the organisation with defined services and alignment to a central approach.



Road to Zero Portfolio Management

Portfolio management is the selection, prioritisation and control of an organisation's programmes and projects, in line with its strategic objectives and capacity to deliver. The goal is to balance the implementation of change initiatives and the maintenance of business-as-usual, while optimising return on investment.

The Waka Kotahi *Road to Zero* Portfolio includes:

- The Speed and Infrastructure Programme
- Tackling unsafe speeds
- Vehicle safety promotion
- Work related road safety
- Road safety partnership programme
- National road safety education and advertising programme
- Local road safety promotion programme
- Alcohol interlock and vehicle impoundment programme

One of the key distinguishing features about portfolio management is that it is a process that is clearly characterised by business leadership alignment, which in this case is provided by Waka Kotahi's commitment and alignment to the *Road to Zero* Strategy.

The *Road to Zero* priorities were set using the Integrated Intervention Logic Model (IILM) which informed the development of the DSI reduction target. It estimated that approximately half of the benefits will come from speed and infrastructure interventions with the other 50 percent coming from improved vehicle technology, enhanced enforcement and the safer choices and behaviour of road users in the road system.

The Road to Zero Speed and Infrastructure Programme looks to reduce deaths and serious injuries by 600-650 DSI's per year by 2030.

Risk and reward are considered and balanced, and programmes are selected based on their alignment with the sector strategy. Feedback is provided from programme and project implementation so that portfolio adjustment can occur, if necessary. Strategic changes can also require portfolio adjustments and work through the portfolio governance as described previously. The portfolio requirements provide the framework to set the *Road to Zero* SIP Strategic Implementation Programme, which is the ten-year baseline programme.

Road to Zero Speed and Infrastructure - Programme Management Approach

Waka Kotahi has a low level of maturity for programme management. The previous SNP has established governance, project and programme controls, and a series of small project process changes for the management of the programme. There are still improvements to be made and further changes required as a result of the ten year *Road to Zero* Strategy, recent organisation changes (Transport Services Group's restructuring), establishment of several delivery programmes in Waka Kotahi and a general shift to longer term planning and programming.

Work in the *Road to Zero* portfolio level establishes the *Road to Zero* Strategic Model and Strategic Implementation Programme. This informs the baseline for the ten years and aligns with the *Road to Zero* Strategy. The accountability for the programme lies across Waka Kotahi and in the portfolio governance structure.

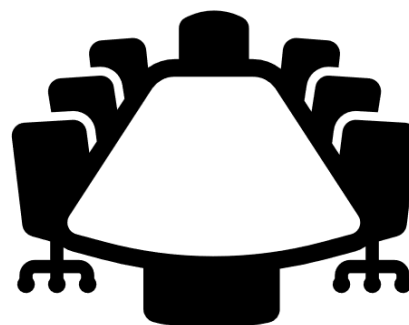
The Transport Services Group is accountable for the *Road to Zero* Delivery programme which is the agreed programme of projects to be approved through the three-year RLTP/NLTP approval processes. The benefits of this programme will be measured primarily based upon delivery of this programme. It is expected that some individual projects will span NLTP periods and will contribute to the over-all achievement of the Strategic Implementation Programme.

This programme also has additional 'benefits streams', or sets of interrelated benefits, such as increasing organisational and sector capability, embedding the safe system approach, improved relationships with partners through the introduction of new investment and assurance approaches, new design standards, new technology and data management systems that cut across functions in Waka Kotahi. As such the programme relies on a series of intra-agency relationships to make it successful.

For example, the Safety Health and Environment Group and the Engagement and Partnerships Group need to work closely to enable successful delivery. As such the programme spans functions within Waka Kotahi i.e. they have multiple elements of the Waka Kotahi business system, and therefore strong governance and management needs to be established to support the successful delivery, as detailed in the following section.

Road to Zero Governance

A Road to Zero SIP Governance Group is established for the programme that has been delegated responsibility for all programme decisions below the board level.



Lessons Learnt – Safer Journeys

In 2015, an independent interim evaluation of the effectiveness of Safer Journeys found that while the focus of the strategy was sound, there was insufficient leadership and sector capacity necessary for successful implementation. Greater collective and sustainable leadership, coordination and participation from Ministers and government agencies was needed.

In addition, Safer Journeys lacked national targets and overall outcome targets. This allowed operational focus to shift away from road safety. It also meant there was limited ability to track the impacts of interventions and the overall impact of the strategy over time.

The interim evaluation made a series of recommendations about how the road safety system is managed in New Zealand. These included recommendations that any new strategy set ambitious trauma reduction targets and that we update the value of statistical life to help us allocate resources more rationally.

It also recommended that we strengthen road safety management capability and refresh the high-level governance group for road safety in New Zealand. These recommendations have been considered in the development of the proposed governance arrangements shown in Figure 28.

Portfolio Governance Structure

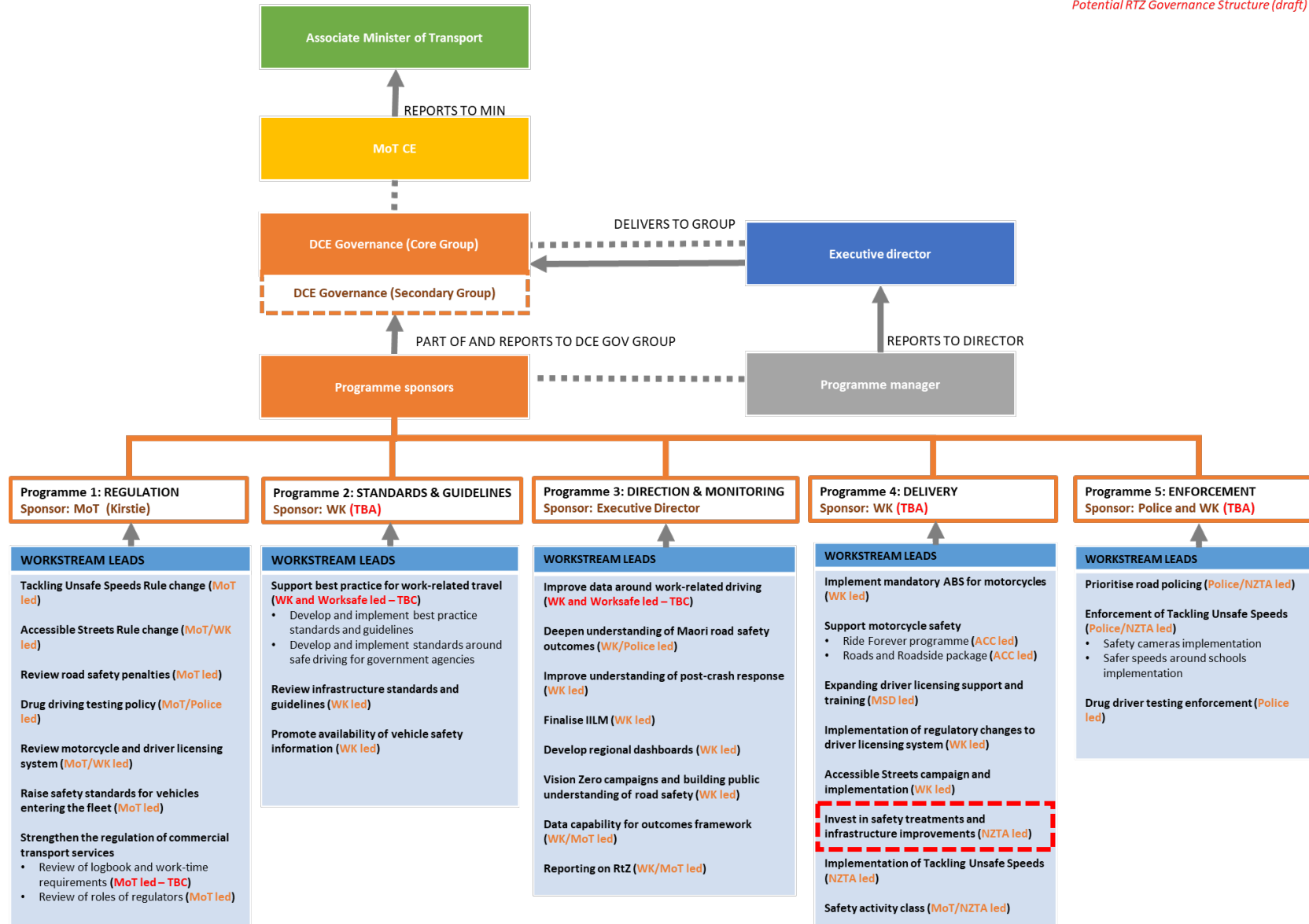
Road safety belongs to everyone. The *Road to Zero* Strategy's success will require sound governance, strong programme and project management, effective partnerships and everyone working together. Waka Kotahi is part of a cross-government team, led by the MOT, tasked with improving road safety outcomes for the community, adopting the 'Vision Zero' philosophy and framework in New Zealand, and implementing *Road to Zero*. Figure 28 below shows the governance arrangements proposed by the MOT for the *Road to Zero* Strategy.

Waka Kotahi will be represented on the Deputy Chief Executive (DCE) Governance (Core Group). This group will be responsible for cross government agency oversight and guiding strategic direction and delivery, including future action plans. This group will be supported by an Executive Director who will play a lead role in stakeholder engagement on *Road to Zero*, driving delivery and influencing across tiers, monitoring, reporting, and managing risks across the whole *Road to Zero* programme.

Waka Kotahi will also be a sponsor to several programmes including Programme 4: Delivery, which includes increased investment and delivery of safety treatments and infrastructure improvements. Programme sponsors are responsible for governance within their programmes (including with other agencies/stakeholders) and progress on actions, including ensuring action plan project leads are tracking to agreed timelines, risks are identified and managed, and identifying linkages across work.

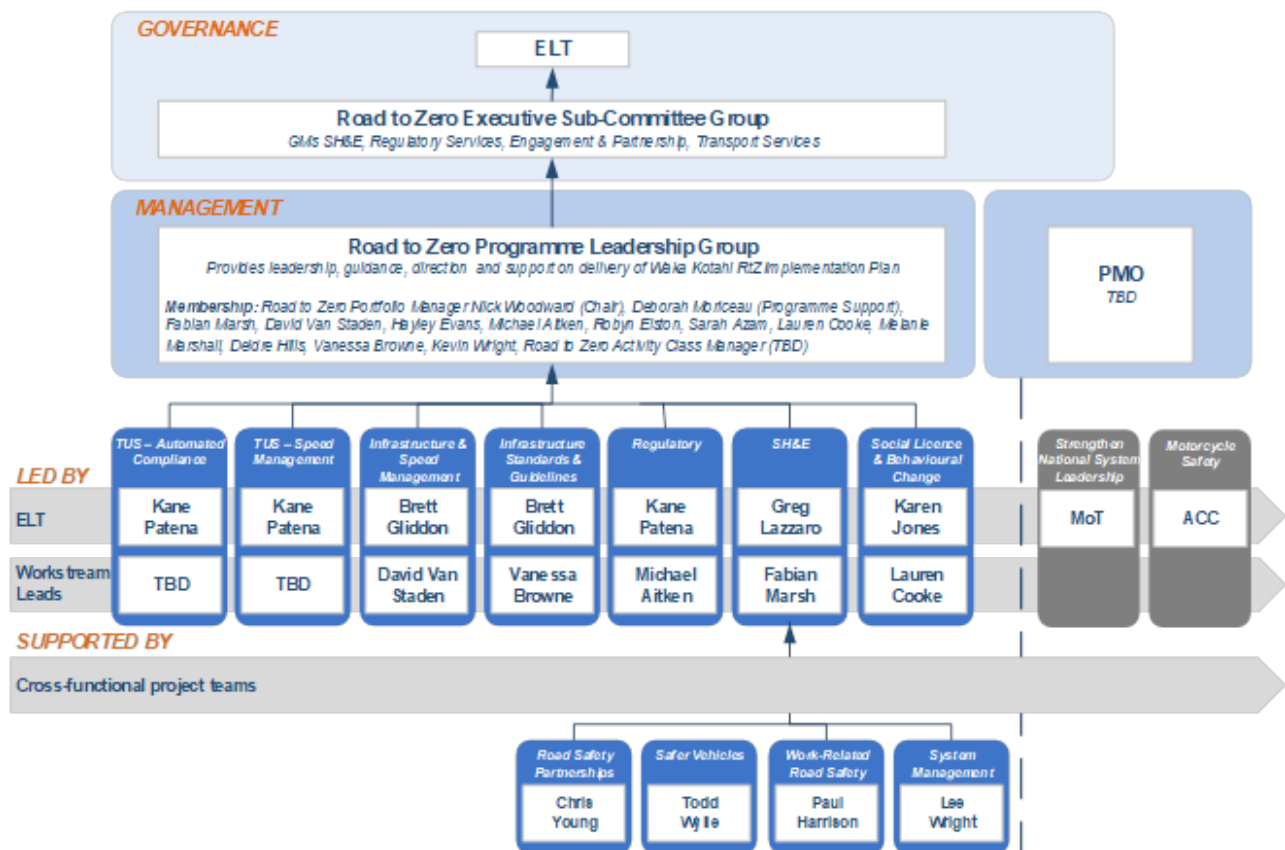
Figure 28 Draft Governance Framework for Road to Zero

Potential RTZ Governance Structure (draft)



The Waka Kotahi contribution to the 40 percent DSI target will be delivered through a number of stand-alone, interdependent programmes and projects and business as usual activities structured into various workstreams. To compliment the cross-government *Road to Zero* governance framework, Waka Kotahi has established an internal portfolio management approach to provide strong governance and workstream management. This is in acknowledgement of the priority of the *Road to Zero* Strategy outcomes and the complexity and breadth of actions assigned to Waka Kotahi under the *Road to Zero* Action Plan - these actions span all business groups and involve external stakeholders. Figure 29 shows the Waka Kotahi *Road to Zero* Portfolio governance and management framework.

Figure 29 Governance and Management Framework for the Waka Kotahi Road to Zero Portfolio



Waka Kotahi have established a *Road to Zero* Executive Sub-Group that is collectively responsible, on behalf of Waka Kotahi, for ensuring the delivery of our outcomes that contribute to achieving the full *Road to Zero* Strategy. This Sub-Group will be chaired by the General Manager (GM) Safety, Health and Environment (SH&E). The Sub-Group’s purpose is to provide oversight and assurance to the wider Executive Leadership Team (ELT) and the Board across all the workstreams delivering on the *Road to Zero* Strategy, including achieving outcomes, prioritisation, managing risks, overcoming obstacles and harnessing opportunities. This is designed to align to the Executive Priority areas that ELT have already subscribed to.

A Programme Leadership Group of Senior Managers from across Waka Kotahi business groups has been established, led by the *Road to Zero* Portfolio Director, to provide leadership, guidance, direction and support on delivery of RtZ programmes, projects and business-as-usual activities.

A Portfolio Management Office will be established to embed and link key supporting organisational functions, such as programme management, change management and strategic communications to the *Road to Zero* portfolio.

Road to Zero SIP Governance

The current SIP is managed by the Infrastructure Delivery Team in the Transport Services Group (TSG) of Waka Kotahi and supported by specialist teams from across Waka Kotahi business units. In particular:

- Investment and Finance
- Transport Services
- Safety, Health and Environment
- Digital and Workspace
- Corporate Support
- People
- Engagement and Partnerships

Current State

The current governance and approvals structure within Waka Kotahi is fragmented with different groups accountable for different decisions. There is a need for a single governance structure for the SIP to support decision making and enable consistency.

Future State

The *Road to Zero SIP* Programme requires a governance structure that can actively support the outcomes delivered by the programme. As such, Waka Kotahi will establish a *Road to Zero SIP Governance Group* with collective accountability for the *Road to Zero SIP* programme as shown in Figure 30. This Group will be chaired by the National Manager, Infrastructure Delivery (Transport Services Group) and the nominated deputy will be the Senior Manager, Road Safety (Safety, Health and Environment) who are both accountable for the *Road to Zero SIP* for Waka Kotahi.

The purpose of the *Road to Zero SIP* Governance Group is to provide oversight and assurance to the *Road to Zero* Programme Leadership Group and the *Road to Zero* Executive Sub-Group across the Speed and Infrastructure Programme, monitor the performance of the delivery and provide recommendations, guidance and perspective as well as direction on key decisions.

It is accountable for the programme achieving its outcomes, managing programme risks, overcoming obstacles, and harnessing opportunities. It will also provide recommendations to the *Road to Zero* Executive Sub-Group on any changes to scope or cost overruns.

Decision Making

Good governance and decision making relies on consistent and efficient programme decisions. As part of a portfolio, the programme requires its own level of governance to execute the programme outcomes and delivery targets. This allows the capability of the SIP governance group to be commensurate with the programme challenges and focused on delivery.

The governance model shown in Figure 30 highlights the high-level complexities and interrelationships required to make decisions to run the programme at the level of collaboration required across teams. Previous governance arrangements meant decisions were difficult to launch, track and resolve for investment applications, design approvals, project initiations, speed changes and more.

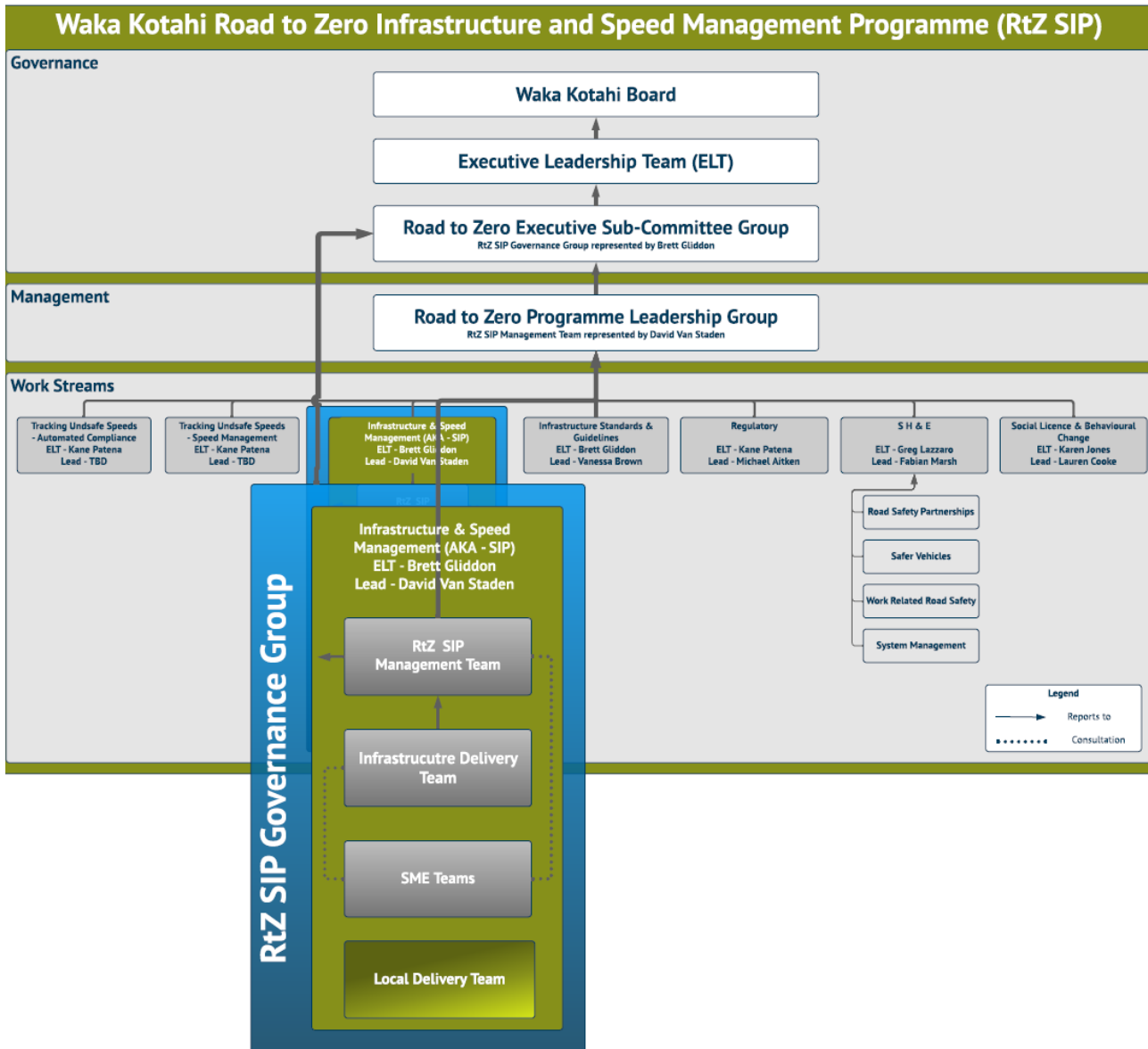
By establishing a capable (right skills and delegations) SIP governance group, it's possible to achieve a high level of independent assurance but also increase the speed of decisions.

The proposal is to include the delegation authority holder in the decisions for the programme in one single governance structure. The benefits would be not only increased speed but a better level of subject matter expert support for decisions, whereby the nature of the seniority and experience in the SIP Governance Group can accept any risk transfer proposed or required by the programme. Examples include the management of contingency across the programme, or investment applications to endorse the scope and approve the funding

of the SIP investment packages. This would be a more efficient process than current practice, which includes funding applications going to the Delegations Committee for endorsement and then to the Chief Financial Officer for funding approval.

It is important to note that two members, who have delegated authority to endorse the scope of funding applications and approve the funding request, sit within this SIP governance group i.e. Senior Manager Programme and Standards and the Chief Financial Officer, Corporate Support. Furthermore, this is supported by the new TSG changes to sponsorship for programmes and project governance highlighted below.

Figure 30 Recommended SIP Governance Model



The role of the SIP governance group chair and other key roles and responsibilities is outlined in the *Road to Zero* SIP Governance Charter.

Communication and Engagement

Waka Kotahi will develop an engagement and communications package to raise awareness of the wider *Road to Zero* approach to road safety and why it is needed.

This package is currently under development and will include advertising and collateral on the effectiveness of the Safe System approach designed to support key stakeholders and local government in their road safety conversations with the public.



Lessons Learnt – NLTP 2018-2021

A lesson from the current 2018-21 SIP is the key role that strong national and regional stakeholder relationships play in the successful delivery of this programme. During the current NLTP period the disestablishment of the Safe Roads Alliance and the transfer of the delivery, including communications and engagement back into Waka Kotahi, has enabled the programme to build stronger relationships, strengthen story telling around the programme outcomes and manage more closely programme delivery in line with Waka Kotahi best practice. As the SIP has gained momentum and project delivery has commenced, engagement with mana whenua, local stakeholders and communities on a regional and corridor basis has improved.

It has become evident that some councils require significant support to increase the uptake in funding for safety improvement projects. Increased engagement with councils in the latter part of the NLTP period has resulted in improved local road safety initiative uptake, this partnership with local government will need to be an ongoing focus over the coming NLTP period.

Strategic Communications and Engagement Plan

Communications and engagement plays a critical role in bringing people and communities along on the journey, providing an overarching road safety story and practical tools to ensure there is one consistent and aligned road safety conversation for all New Zealand. This will ensure we are able to successfully deliver the significant safety improvements package and support local government with delivery of the local roads package and local road safety initiatives. The Communications and Engagement will support individual workstreams while enabling alignment and connections to the overarching objectives of *Road to Zero*.

Waka Kotahi is developing a public awareness campaign (provided for through a separate business case) to lift public understanding of the *Road to Zero* approach and supporting its tactics, an action specifically outlined in the strategy. This includes increasing public understanding of the safe system approach to reducing DSI's on the road network, building on and supporting Waka Kotahi's existing advertising and behavioural change programmes.

Over time, the strategic thinking and learnings from the development of this campaign will feed into more targeted advertising, education, communications and engagement deliverables which will raise community awareness of Vision Zero and raise public expectations for Waka Kotahi to deliver what is required to reach the *Road to Zero* goals.

This will be integral, with the other advertising and behavioural change programmes (including Waka Kotahi's National Road Safety Education and Advertising Programme), to help the community and key stakeholders understand and support the need for road safety interventions. This work will be led by Waka Kotahi with support from partners including the MOT, NZ Police, and local government.

The programme will be developed in such a way as to honour our commitment to Māori and Te Tiriti o Waitangi. Waka Kotahi will collaborate with Māori in a meaningful way in line with the Waka Kotahi Māori strategy: Te Ara Kotahi.

Within the *Road to Zero Strategy's* System Management focus area is the development of a programme to build sector capability in the Safe System Approach, together with an extensive programme of updated and new standards and guidelines, and other initiatives that will support local government in their road safety decisions. A strong communications and engagement campaign will support the roll-out of this capability programme and associated training, and other resources.

This business case recognises the value of good communications and engagement when it comes to delivering speed and infrastructure interventions and the importance of being resourced appropriately to enable communications and engagement to be done well in the local road safety environment.

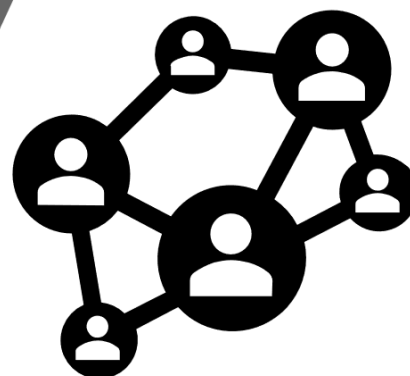


Local Road Partnerships

It is important that Waka Kotahi listens to the needs of local authorities and recognises that they each have different needs for assistance.

Genuine co-design and co-investment means that Waka Kotahi recognises that partners know their programmes best.

The SNP team's role is to support councils in co-design of programmes with technical and programme level support, testing for safe system alignment through to delivery.



Local government has a critical role to play, both because it operates and maintains 88 percent of New Zealand's roading network but also as an advocate for road safety in local communities. Stronger central and local government partnerships can help support local government leadership and promote effective coordination within and between regions. This should include sharing knowledge and best practice through forums such as Regional Transport Committees (RTC) and the Road Controlling Authorities (RCA) Forum.

Waka Kotahi seeks to achieve this through meaningful support in a variety of ways such as leadership, co-investment, technical and resource assistance. The purpose of the Local Road programme is to enable rapid delivery of local road safety improvements projects through the RLTP/NLTP. An integral part of the Local Road programme is collaboration and engagement with local partners to ensure the programme is co-developed and co-designed.

For this PBC, four areas have been prioritised for improvement:

- Incentivise local council investment to support the right size and timing of interventions
- Establish a partnership model for local government and key national stakeholders
- Establish a new range of urban safety interventions that take account of 'place function'
- Increase the scale of interventions that councils have in the programme.

To achieve the programme efficiencies required to meet the *Road to Zero* outcomes, it is vital that there is a consistent approach to investment approvals across internal Waka Kotahi teams. This includes, but is not limited to, consistency across the Partnership Investments team, Delegations attendees in Transport Services and with local partners. To enable delivery at the scale and pace required, dedicated support and resources will be required to assist with the development and processing of local road programme funding applications. Funding decisions and investment assurance are important aspects across all levels of Waka Kotahi's, not only at governance levels. An increase in consistent knowledge of relevant information and requirements is key.

Incentivising Delivery

Local authorities are at risk of not delivering their contribution of the *Road to Zero* SIP because their revenue is constrained for local share because of COVID-19. This likely means a change in the composition of their programme, i.e. speed interventions are prioritised over infrastructure interventions, which may in turn mean less DSI reductions overall than the programme proposed.

One way to incentivise delivery and encourage local authorities to right size and prioritise the timing of safety improvement projects is through a targeted enhanced funding assistance rate (TEFAR). However, this will place further pressure on the NLTF and result in less investment in other areas. Local authorities have requested that Waka Kotahi consider the continuation of TEFAR but have also asked that the eligibility requirements be reviewed.

Most Local Road projects are Low Cost-Low Risk (LCLR) roading improvements. LCLR is a highly effective investment process used by local authorities to deliver safety outcomes for the community. Anecdotal evidence suggests that this pathway is sometimes used by local authorities to progress less effective safety treatments as the process is quicker and less resource intensive than the business case approach or using the SSI approach.

The decision to increase the threshold of LCLR from \$1 million to \$2 million in the 2021-24 NLTP could exacerbate this practice. It is expected that 90 percent of local road safety projects will be under this new threshold, compared to approximately 65 percent in the current NLTP period.

It is recommended that further investigation of the SSBC Lite approach is undertaken to better understand why anecdotal evidence suggest that some local authorities are hesitant to utilise the business case approach including the recently available SSBC Lite approach. It is proposed that a trial SSBC Lite is completed and reviewed by the wider investment and investment quality assurance (IQA) teams to identify areas for improvement such as in the guidance or communication provided to local authorities on the SSBC Lite approach to encourage uptake. Noting that most SIP projects are anticipated to be funded via the SSI Pathway.

Local Partnership and Delivery

Early and extensive involvement of key internal stakeholders in the local road programme development is critical to the success of programme delivery. Early involvement with local authorities helps to enable consistent investment policy and process advice so that any safety engineering and funding issues are addressed within the RLTP timeframe.

Evidence from discussions with stakeholders suggests that local partnership and delivery is under-valued and engagement with local partners is currently disjointed and under-resourced. Some local partners previously felt they were told what to do rather than asked for knowledge about their network and community.

To address these concerns, it is important that Waka Kotahi listens to the needs of local authorities and recognises that they each have different needs for assistance. Genuine co-design and co-investment means that Waka Kotahi recognises that partners know their programmes best. The SIP team's role is to support councils in co-design of programmes with technical and programme level support, testing for safe system alignment through to delivery.

Road to Zero offers a long-term vision for road safety outcomes, however it is easier to engage local authorities over a ten-year timeframe to align with the development of Long-Term Plans and RLTP's. To assist with programme development and a continuous delivery model it is recommended that work is progressed to enable NLTP 2 activities to be reviewed, endorsed, and indicatively agreed at an RTC level within NLTP 1. This would enable projects to be progressed and if required brought forward more easily. It is recognised that the current approach results in a lag time between the planning and design phases and the implementation of a local road safety improvement.

Funding for the design or pre-implementation works for the next NLTP in year two/three of the current NLTP would achieve a smoother delivery rate, rather than the current approach of undertaking the design in year one/two and then not commencing construction until year two/three, which adds pressure to the delivery of the programme.

To help address these concerns, it is recommended that a centre of excellence is developed, including the development of a partnership model for Local Government and key national stakeholders, where there is a

consistent and common message around the 'why' and the 'how' to enable effective and efficient delivery of road safety improvements, alongside local authority partners.

Another issue with local partnership and delivery is that the current Waka Kotahi systems cannot monitor delivery progress or safety outputs on the local network. To address this, a performance monitoring system should be established with partners to track progress.

Urban Safety Interventions

A recent addition to the SSI toolkit is to include other 'place making' considerations as part of improvements to urban intersections. For example, inclusion of pedestrian/cycling access and other outcomes are now considered as part of the safety improvement.

Programme Ambition

The local authority programme is predominantly LCLR and speed changes which returns a high level of DSI return for every dollar spent. However, it is the safe system transformation (SST) projects that provide long lasting transition to a safe system. The team will seek to increase the number and impact of SST intersection and corridor projects on the local authority network.

Investment Approvals

There is a need to implement improvements to the current SNP investment approval approach and to streamline the funding/decision process.

Packaging applications will help to save time and improve efficiency, whilst maintaining transparency and independent accountability.



Safety should be uniformly recognised as a critical investment priority and not be treated just like other priorities as part of a trade-off conversation. Every death or serious injury on New Zealand roads is a call to act, investigate, diagnose, and address. The *Road to Zero* Strategy identified the need for Waka Kotahi, NZ Police, and the Ministry of Transport to undertake a review of the existing road transport investment framework to better embed *Road to Zero* principles into investment decision-making.

To enable the delivery of road safety improvements at the scale and pace required to meet the *Road to Zero* outcomes, a number of improvements and changes have been identified to streamline current investment practices, whilst maintaining accountability and investment assurance, as summarised in this section.

This section provides a roadmap for developing and implementing the SIP, including a proposed approach to the packaging of programme activities and to document and agree the optimal Funding Approval Pathway for these packages for the 2021-24 NLTP period.

The key objective is to secure programme funding for the SIP Delivery Programme (2021-24), and to confirm that this funding is available from the start of the 2021-24 NLTP period (1 July 2021). To achieve this objective there is a need to implement improvements to the current SNP investment approval approach and to streamline the Funding Approval Pathway, including upskilling relevant teams to reduce ongoing re-litigation of the SSI toolkit and criteria, which is resulting in delays.

Lessons Learnt – NLTP 2018-2021

Projects are currently considered on a case by case basis, primarily through the SSI Investment Pathway. This results in significant input from the SNP team to draft individual applications and then time for each individual project to transition through the Investment Approval process. At the scale required by the *Road to Zero* Strategy the approval process has been identified as a key bottleneck in the current approach. This process involves steps that are internal and external to the SNP team.

If this problem is not addressed, then it is likely to impact the ability of the SNP to deliver at the scale and pace required to achieve the *Road to Zero* Strategy targets and outcomes. It will also place pressure on wider teams within Waka Kotahi due to the likely number of SSI Funding Applications that will need to be processed and progressed through each stage of the project lifecycle.

Baselining the Strategic Implementation Programme

The *Road to Zero* strategic programme as documented in this PBC is prepared at a macro national level to identify the areas that will be targeted for investment in the 2021-24 NLTP period to progress the *Road to Zero* strategic outcomes.

The *Road to Zero* implementation programme, broadly aligns to the strategic programme in terms of the split of corridors and intersections to be targeted, but provides a more detailed overview of the programme at a regional level and considers programme prioritisation based on available funding allocations for a given NLTP period. To deliver the SIP at the scale and pace required to achieve the *Road to Zero* strategic outcomes the following baselining activity has been undertaken to develop the optimal projects for the Strategic Implementation Programme and the subsequent Delivery Programme.

To continue working towards the overall *Road to Zero* 2030 target of 40 percent DSI reduction, the programme baselining exercise will require changes in terms of location, timing, and intervention. It is not just a case of removing projects at the bottom of the list to meet the funding availability, but a complete review of the programme is required if early delivery and targets are to be considered. The reasons the baselining is required are:

- Reduced revenue for Waka Kotahi and Local Councils.
- Constrained funding has resulted in the more costly and complex projects being programmed for the latter half of the ten-year period. This will result in a lumpy ten-year programme, creating a bow wave of work resulting in increased costs and risk of not delivering.
- The inter-relationships with other programmes and timing of delivery e.g. the NZ Upgrade Programme will be competing for the same resources which exacerbates an already identified problem relating to capacity and capability.

Packaging

In the context of the SIP, packaging is an approach employed with the aim of producing the optimal sized project for our assurance and value chain.

Benefits of a packaging approach include:

- Providing more information for funding approvers by developing a 'story' for the identified corridor, including the list of interventions to be delivered over a ten-year period, while seeking funding approval for specific packages of phased interventions.
- Providing efficiency gains in funding processes and deliverability as funding will be sought for a package of philosophies or interventions for a corridor, combined as one funding application. This reduces the

volume of individual SSI applications and enables a location targeted approach to construction procurement, planning and build activities.

- Providing a framework for improved community communications, presenting the full corridor safety improvement 'story' for a location rather than multiple one-off communications for each treatment location.

Programme resource levelling is then undertaken to confirm affordability within the NLTP periods and investment levels as well as sizing the programme to the anticipated sector capacity level. The output is a packaged Delivery Programme submitted for Waka Kotahi NLTP processes. Work is underway to identify the correct packaging approach for the programme - potential packages include:

Packaged Individual Corridor Projects

Corridors identified in the SIP *Road to Zero* implementation programme for NLTP 2021-24, or related / neighbouring activities with different treatment philosophies or with different prioritisation will be packaged in a logical and meaningful way and will include multiple SSI applications.

The key output of this additional step would be an agreed 2021-24 SIP Delivery Programme. It is recognised that each of the above packages is likely to interface with other packages. Once defined and agreed it is anticipated that the management of these inter-dependencies would be coordinated through Programme Controls such as project interface assessment procedures, defined project metadata for aggregated reporting and communication and regional communications and engagement planning.

Safety Management Package

Where safety management, lower-cost measures (such as ATP markings and warning signs) are not included as part of a corridor project, they will be grouped together in a national or regional package. An example and aligned to the Safety Boost programme underway.

Speed Management Programme

Where speed management corridors are not included as part of a corridor project, they will be grouped together in a national or regional package. An example of this is the Speed Tranche 2 programme underway and alignment to this will be part of the packaging work.

Packaged SST Intersection Programme

Where safe system transformation intersections are not included as part of a corridor project, they will be grouped together in a national, region, urban or rural package.

Identification and Prioritisation of Funding Application Pathways

Each of the proposed groupings or packages of activities listed above (Safety Management, Speed Management, Intersection Programme and Corridor Projects) will require a funding application to be prepared. The specific funding pathway will be dependent on several factors, including the investment value, risk, and type of activity e.g. individual SSI, grouped SSI or interventions that are not within SSI thresholds.

There are four potential funding pathways that have been identified (after the PBC):

1. The Low Cost-Low Risk funding pathway
2. The SSI funding pathway
3. The business case funding pathway – SSBC Lite, SSBC, IBC & DBC
4. A Cost Scope Adjustment for an existing project

It is likely that the different packages will require a different funding pathway to be followed. However, there are some key investment principles that should be followed and understood regardless of the funding pathway, these include:

- Any activities or package of activities are subsets of the *Road to Zero* programme and SIP PBC. As such the PBC provides the strategic context, strategic assessment, strategic response, and options assessment, as well as the financial case for the overarching programme. The purpose of the subsequent funding applications is to detail the commercial and management case for each activity i.e. the procurement and management of the next steps.
- The funding pathway for each package should be right-sized and the minimum viable product to maximise the efficiencies that have been outlined
- A consistent approach should be adopted for each package to improve efficiency
- Confirmation of the appropriate funding pathway for each package should be made in consultation with wider Waka Kotahi teams, including Design Practice Solutions, Partnership Investments and Investment and Finance teams.

The SSI Funding Application is currently the primary pathway for seeking project and/or activity funding endorsement and approval for SNP activities. Speed management and Boost programmes have been progressed through a separate funding pathway. Anecdotal evidence as outlined in the earlier section suggests that the SSI Funding Pathway, as currently applied, could be made more efficient through the packaging of applications.

Figure 31 State Highway Standard Safety Intervention Funding Approval Process



Figure 32 shows an overview of the current SSI funding pathway, which contains several separate hold points and decision gateways prior to receiving funding release. It is proposed that this current approach is streamlined as shown in Figure 33.

Figure 32 Current SSI Pathway Approval Process



Figure 33 Future SSI Pathway Approval Process



Figure 33 shows the proposed future process for seeking project approval within SSI thresholds. This approach would maintain the independence of the investment approval process and maintain existing delegation powers of both the National Manager Programme and Standards (for projects with an Implementation Cost up to \$50 million) and the CFO (for projects with an Implementation Cost up to \$100 million).

However, as outlined in the governance section above, both the National Manager Programme and Standards and the CFO are also part of the SNP Governance Group, and remain independent from the SIP team, it is proposed that the SIP Governance Group meeting be used as the forum for seeking project approval within SSI thresholds from the National Manager Programme and Standards and the CFO. This approach would

significantly reduce the time taken for approvals, particularly through reduced lead time between each separate gateway and reduce the duplication of delegation meetings.

For projects or packages outside of SSI thresholds, it is proposed that the current approval process as shown in Figure 32 would still apply i.e. considered by the SIP Governance Group and then Delegations Committee.

In addition, the processes used throughout the NLTP 2018-21 period required each individual SSI project application to be drafted and taken through the SSI Pathway approval process separately. By packaging project applications by region and/or treatment type, time and resource efficiencies can be realised.

The team seeks endorsement to continuously re-prioritise, approve, design, and deliver the programme for projects that:

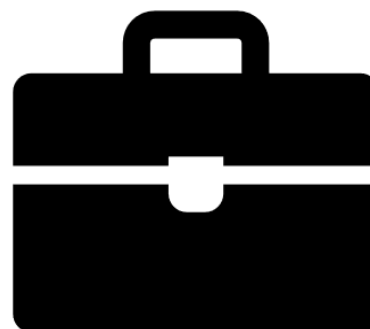
1. Have high DSI return as identified in the SIP PBC
2. Are aligned with SSI criteria
3. Can be delivered quickly in the 2021-24 NLTP
4. Have low community and stakeholder risk.

An example of this approach is the SSI median barrier projects identified as part of the SIP PBC. Waka Kotahi have developed a scalable median barrier programme (\$70 million – 100 million) that is SSI compliant. Flexibility of timing or schedule, being able to start looking at the full scope initially but being able to quickly shift between corridors and run parallel work streams is critical to the delivery of the SIP.

With the delivery space being an ever-changing environment with outside influences beyond immediate control, this means the team needs to be able to prioritise and programme safety activities, where work can be delivered quickly and have an impact. Actively managing and integrating both the state highway and local road safety programmes to streamline project approval, expedite delivery and seek opportunities for rapid and shared procurement, design, and construction.

Delivery Capability and Capacity

Waka Kotahi needs to be able to identify and respond to key capacity and capability gaps to enable state highway, local and regional road safety responses to be well-resourced and to confirm that guidelines are being applied robustly and consistently.



The *Road to Zero* Action Plan (2020-22) indicates an increased investment in the SIP over the next 10 years by approximately 20 percent. It is estimated that this will require an investment of at least \$5 billion over the 10-year period. This scale of implementation is significant but still considered achievable, albeit at the upper limit of deliverability. This would require approximately doubling of the delivery rate for state highways under the current SNP, which creates some challenges for delivery and a need to reshape current delivery processes to achieve the desired outcomes.

Industry capacity and capability has been stretched with the current programme, especially for specialist services such as rumble strips and barrier installation. Industry will be more prepared to respond and scale up

for this programme if they have visibility and certainty around the pipeline of work. However, this needs to be tempered with all the other work in the pipeline, including the NZ Upgrade Programme, which is already having an impact on the capacity of the industry.

While the new regulatory approach to speed management should deliver a simpler and more efficient process for speed management, the scale of the Speed Management Programme is significant. Waka Kotahi has experienced several challenges on speed reviews delivered to date including challenges around the current process and resistance from some communities and stakeholders.

Initiating the programme mid 2019 with a tranche of 41 reviews at once put pressure on Waka Kotahi resources. Getting the Speed Management Programme to a continuous state without the annual or NLTP period constraints will assist delivery.

Capability

Regional road safety stakeholders have been clear that they face real challenges in collecting and understanding road safety data and trends. Waka Kotahi needs to provide agencies, local government and road safety groups with better information, intelligence and tools, and support capacity and capability building cross the sector, to help them understand, communicate, and respond to their road safety issues.

Waka Kotahi will continue to undertake modelling to develop a better understanding of what a Safe System looks like for New Zealand and how best to achieve Vision Zero (or near Vision Zero) levels of serious road trauma. This includes the continued development of the Integrated Intervention Logic Model (IILM) in partnership with key road safety stakeholders.

Waka Kotahi will also continue to develop Vision Zero network modelling capacity to improve and build upon existing SIP development tools. The intent is to investigate the gap between the current state of the road network and the future Safe System state to identify and quantify future road network improvements, in combination with developments in vehicle safety, to achieve close to zero fatalities and serious injuries.

Road to Zero identifies the need for an ongoing capability building programme that will help to embed the updated guidance in day-to-day practice around the country. Waka Kotahi will continue to promote updates to standards and guidelines and will offer technical and practical courses for road safety professionals.

The programme will target a range of internal and external audiences and include formal training, workshops, webinars, published advice and guest speakers. It will also include consideration of setting up a Panel to assist the integration of safety and accessibility objectives in the strategy. This initiative will build capacity and capability to enable effective regional responses to road safety issues. Better communication of the programme for internal stakeholders and industry could also help to build capability.

In addition, there is a need to continually improve internal systems to enable the team to deliver at scale and pace. This includes the use of TIO, SAP and Planview, which are currently operated in isolation to each other and not suitable for delivery of a programme approach. It is proposed that work is undertaken to investigate and prioritise technology changes further to those already being undertaken in Waka Kotahi that better enable programme deliver e.g. Enterprise Data Warehouse.

Capacity

Adopting the *Road to Zero* Strategy and outcomes represents an ambitious commitment to making some transformative changes, such as stronger leadership, committing to safety as a critical priority for investment and decision-making, and a greater focus on system changes rather than on addressing human error alone.

Progress towards the target requires an increase to the scale and pace of delivery, particularly in delivery of the SIP to drive funding certainty and to transition to the use of new procurement models to increase the construction response.

It is expected that capability and capacity will be an ongoing workstream that is reviewed at the end of each NLTP period to align resourcing with the expected activity class level and proposed delivery programme in each NLTP period.

It is difficult to build momentum with the current approach of project-by-project and phase-by-phase funding, and the process for personnel resourcing is rigid and slow. A key consideration in terms of resourcing is the approval of both the ten-year strategic SIP (2021-2030) and the SIP Delivery Programme (2021-24) to drive delivery momentum. An approved programme will enable Waka Kotahi and local authority partners to build towards the level of investment and resourcing required across the ten-year programme to achieve the desired *Road to Zero* outcomes.

To reach the ten-year *Road to Zero* investment levels will require the SIP to build momentum towards a large NLTP 2 and 3 delivery programme, assuming a lower activity class level for *Road to Zero* in NLTP 1. This will likely exceed the historic capacity of the sector (approximately \$300 million to \$350 million per year). It is recognised that current funding certainty over the ten-year period would likely provide sufficient time and certainty for the sector to increase resource capability and capacity.

Design Standards and Intervention Hierarchy

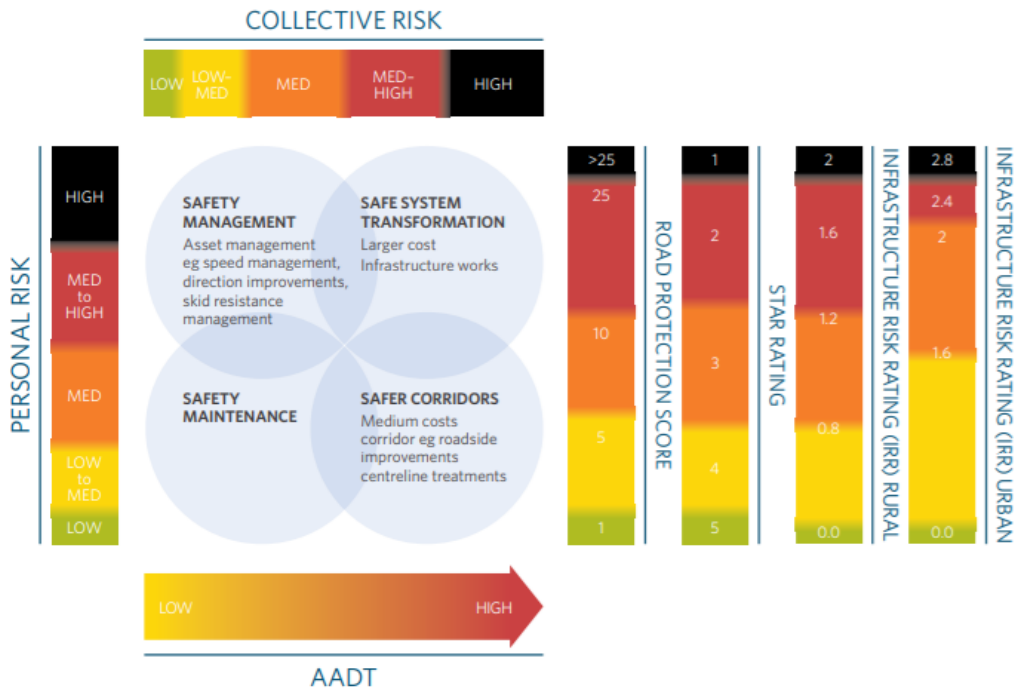
There is a need for ratified design standards for safety improvements, with governance to accept the risk transfer, and a consistent application of these standards across the state highway and local road network. Identifying the appropriate level of intervention is an important step in delivering safety improvements. Ideally, a complete Safe System infrastructure solution would be implemented, however in many instances this may not be practical, affordable, or publicly acceptable.

The safe system treatment philosophy, shown in Figure 34, gives the indicative level of infrastructure change and investment required to be the most cost-effective treatments. Essentially this means that the programme has been optimised. The treatment philosophy diagram is a guide to the types of treatments that are the most appropriate for the level or risk, noting that some measures will cross boundaries. It is important that safety improvements implemented on all New Zealand roads are consistent along the corridors as much as possible, and consistent with the Safe Roads and Roadsides infrastructure objectives.

The treatment philosophy is considered as a level of safety service indicator that is particularly useful for identifying sites that, although lower risk, are performing worse than would be expected. Having identified an intersection or corridor with potential safety improvement benefit, the crashes must be investigated to identify the crash and risk issues that must be addressed. While the focus is on high-risk intersections and corridors, (those typically located in the upper and right sides of Figure 34) it is important to remember low-cost safety management treatments may still apply to the bottom left quadrant.

As intersections or corridors may not feature in the upper and right-hand side portions of Figure 34, it does not preclude them being implemented, just that these improvements should be proportional to the problem.

Figure 34 Safe System Treatment Philosophy Used to Optimise the Programme



Resourcing

The *Road to Zero* SIP is a continuous programme of activity that will require a flexible and scalable resourcing model (i.e. people can move around within the business). A key lesson from the current 2018-21 SNP is the requirement for additional Waka Kotahi Local Road Programme resources.

To support this, the SIP PBC recommends the development of a Centre of Excellence and/or pool of resources (safety experts, funding application support, tools, and materials) to provide sufficient support to Waka Kotahi and Local Partners. Resourcing for local government is dynamic, and the capability requires changes, making it difficult to manage.

Table 17 Resourcing Requirements

Role Requirement	Description
SIP team establishment	Largely made up of contractors that need to be converted to Waka Kotahi FTE and required these roles to be replaced. <ul style="list-style-type: none"> • Safe System Engineers • Investment Advisors • Programme Planners • Business Analysts • Area Programme Managers
SME Support for the Programme	Waka Kotahi has a range of SME that support the programme with advice and effort and their availability is a risk to delivery. <ul style="list-style-type: none"> • Road Safety Engineers • Investment Assurance Advisors • Partnership Investment Advisors • Project Managers • Communications and Engagement Advisors
External support for the programme	This SIP PBC recommends the development of a Centre of Excellence and/or pool of resources (safety experts, funding application support, tools, and materials) to provide sufficient support Waka Kotahi and Local Partners.

Benefits and Monitoring

A key action identified in Road to Zero is to establish a performance monitoring system that meets the reporting and monitoring needs of Waka Kotahi and local partners without adding onerous and unnecessary time or resource burden on either party.



This section provides an overview of the proposed benefits and outcomes monitoring plan for the *Road to Zero* Strategy. It provides a summary of how progress will be measured and reported across all five focus areas to confirm that the programme is on-track to meet the overarching goal of a 40 percent reduction in the number of DSIs by 2030.

This benefits and monitoring section does not provide a comprehensive description of the proposed targets for the *Road to Zero* programme. Interim targets will be developed and agreed for each NLTP period (3 years) to align performance expectations with investment. This section provides the draft framework from which targets can be developed and agreed.

Discussions following a series of workshops with the SIP team and input from wider stakeholders suggests that Waka Kotahi's current monitoring systems are resource intensive, manual systems that struggle to monitor delivery progress or safety outputs on the local network.

Monitoring performance of the local road programme is complex - all local authority partners have unique, established and sometimes limited methods to manage the delivery performance of their investment into road safety interventions. Through engagement, many local authorities have signalled a desire for a simple, common template and tool, noting the data required of them and frequency of updates. It's important to complement their internal reporting metrics to council, and for it to be hosted in a one-source-of-truth platform. To be successful, we need assistance to support this change, by endorsement of processing this approach, both internally and with our external partners to minimise resistance and maximise reporting outcomes.

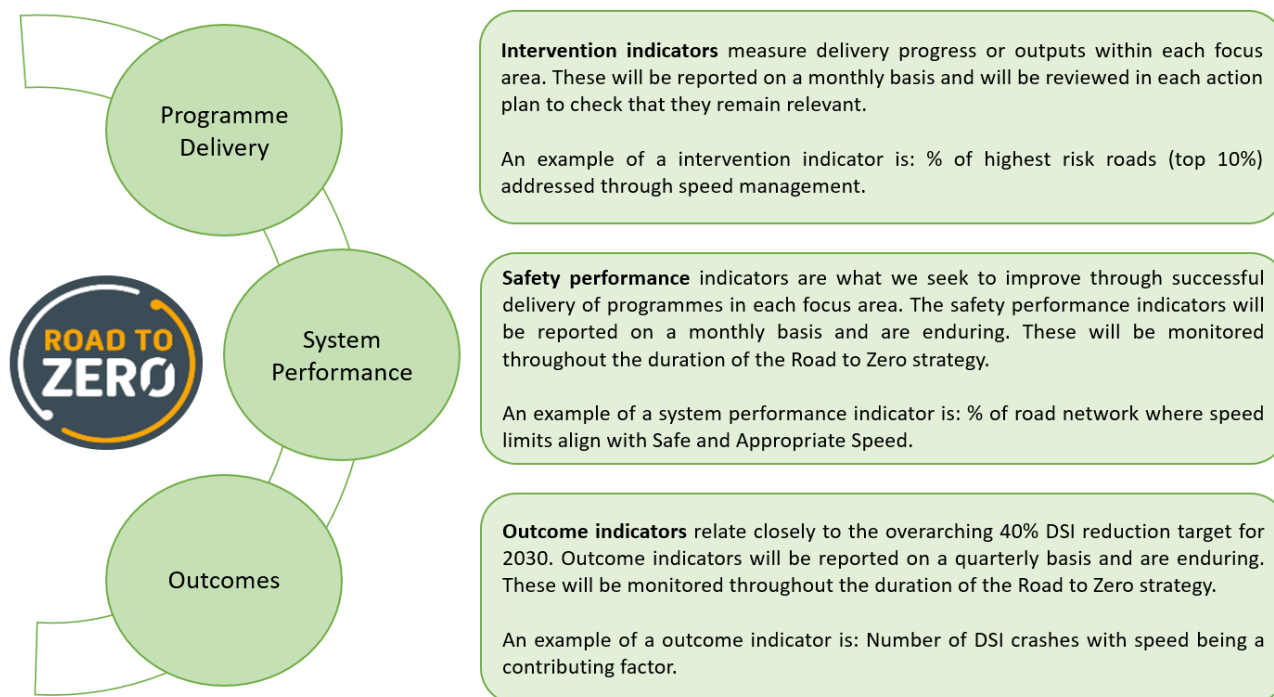
Road to Zero Outcomes Framework

The *Road to Zero* Strategy includes an outcomes framework with a clear result focus to help drive action and hold relevant agencies accountable for delivery. A three-tier framework has been developed to measure progress within each focus area as summarised in Figure 35. Together these indicators help track progress towards achieving the overarching goal of a 40 percent reduction in the number of DSIs by 2030.

An overview of the proposed draft indicators for Speed Management and Infrastructure is detailed in the tables that follow. The draft indicators for the remaining focus areas are detailed in Appendix D - Intervention Indicators. It is noted that MOT and Waka Kotahi are currently working to refine and confirm these draft indicators, so they are subject to change.

A total of 93 indicators are proposed, made up of 37 intervention indicators, 33 safety performance indicators and 23 outcome indicators. Work is underway to identify the appropriate mechanisms to capture data that is not currently collected. The indicators will be reviewed and updated as required for each NLTP period.

Figure 35 Road to Zero Outcomes Framework



Speed Management and Infrastructure

The tables below show the intervention, performance, and outcome indicators for Speed Management and Infrastructure.

Table 18 Speed Management and Infrastructure Programme Delivery Intervention Indicators

KPI	Indicator Description	Owner
1.1.1	# Kilometres of the network treated with safety treatments	Waka Kotahi
1.1.2	# Kilometres of the network treated with median barriers	
1.1.3	# Kilometres of the network treated with side barriers	
1.1.4	# Kilometres of the network treated with new rumble stripes	
1.1.5	# Number of intersections treated to operate within Safe System limits	
1.1.6	Progress around the review of infrastructure standards and guidelines	
1.1.7	# Kilometres of the network treated with reduced speed limits	
1.1.8	% of highest risk roads (top 10%) addressed through speed management	
1.1.9	% of rural schools with 60km/h speed limits or lower (40% by 2024; 100% by 2030)	
1.1.10	% of urban schools with 30-40km/h speed limits (40% by 2024; 100% by 2030)	
1.1.11	% of road safety advertising campaigns that meet or exceed their agreed success criteria	
1.1.12	# Mobile speed camera deployment activity (hours) (increase to 80,000 in 19/20 and 100,000 in 20/21)	NZ Police
1.1.13	# Police operations targeting speed	
1.1.14	% of Officer-issued speed offences between 1-10km/h over the posted speed limit	

Table 19 Speed Management and Infrastructure System Performance Indicators

KPI	Indicator Description	Owner
1.2.1	% of VKT on roads with speed limit above 80km/h that have a median barrier	Waka Kotahi
1.2.2	% of VKT on rural network that has a 3-star equivalent rating or better	
1.2.3	% of high-risk intersections treated to operate within Safe System limits	
1.2.4	Network kilometres of roads adapted for safe pedestrian and cyclist use	
1.2.5	Network kilometres of roads with motorcycling safety treatment	
1.2.6	Perceived safety of walking and cycling (by rural, urban, urban centres, & around schools)	
1.2.7	% of road network where speed limits align with Safe and Appropriate Speed	
1.2.8	% of road network where speed limits align with Safe System	
1.2.9	% of traffic travelling within speed limits (by rural, urban, and urban centres)	
1.2.10	Mean speed of vehicles (by rural, urban, and urban centres)	
1.2.11	% of the public understand the risk associated with driving speed	
1.2.12	% of the public agree that it is likely to get caught when driving over the posted speed limit	
1.2.13	% of road network covered by automated safety cameras	
1.2.14	% of the public agree that safety camera is an important intervention to reduce the number of road deaths	

Table 20 Speed Management and Infrastructure Outcome Indicators

KPI	Indicator Description	Owner
1.3.1	Number of head-on and run-off road DSIs	Waka Kotahi
1.3.2	Number of intersection DSIs	
1.3.3	Number of DSIs crashes with speed being a contributing factor	
1.3.4	Number of DSIs where the speed limit does not align with the Safe and Appropriate Speed	
1.3.5	Number of DSIs where the speed limit does not align with the Safe System	
1.3.6	Number of pedestrian and cyclist DSIs	
1.3.7	Number of ACC entitlement claims related to walking and cycling injuries	ACC

Reporting

The indicators shown in the tables above will help to measure progress both within individual focus areas, but also help to monitor progress towards to overall *Road to Zero* outcomes. The indicators cover both programme delivery through to strategic outcomes that align with Waka Kotahi's performance expectations for the SNP.

A draft reporting framework is summarised in Figure 36, this outlines how each of the indicators will be reported to different groups. Waka Kotahi are currently developing a new automated regional road safety dashboard. This dashboard will provide a quarterly update on most of the safety outcome indicators in *Road to Zero*. It is expected that this dashboard will enable reporting to be made available to internal Waka Kotahi staff, local authorities, and other interested groups in a timelier manner.

Updates for the whole SIP will be provided through monthly reporting to the governance group overseeing delivery of the programme. Included in these reports initially will be an update on the status of the programme in various stages of delivery, i.e., percentage of programme in the planning stage; percentage in design stage; percentage in implementation stage and percentage completed.

For the SIP focus area, monitoring of the programme will be managed by Waka Kotahi, but could involve reporting through to the Regional Advisory Group and Regional Transport Committee.

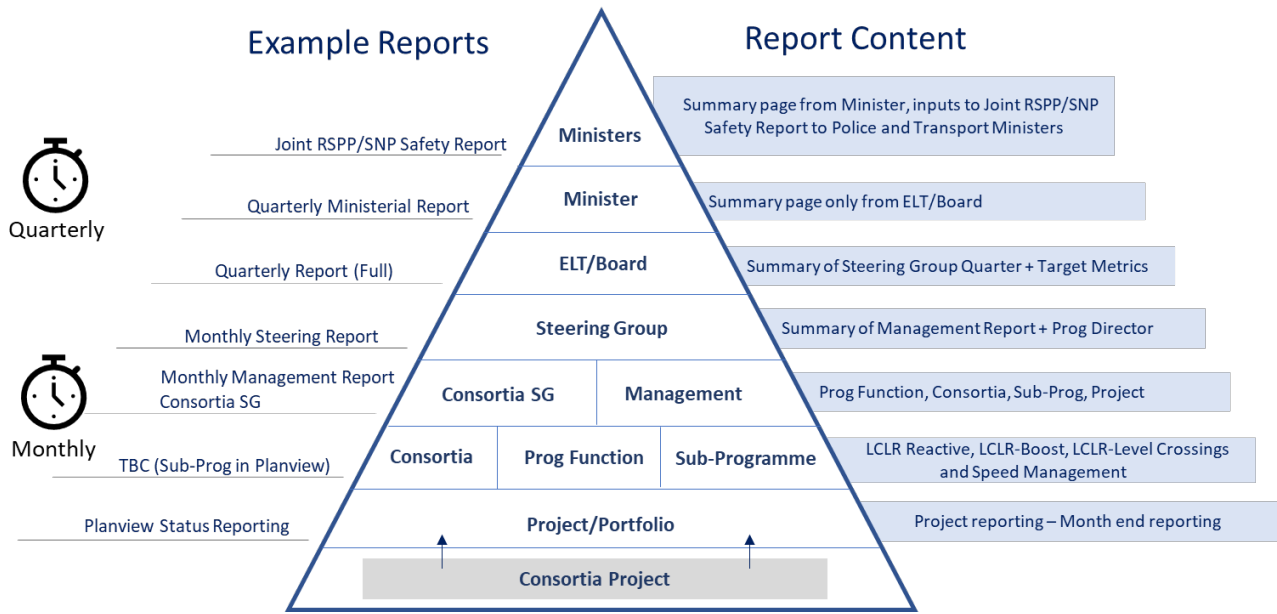
Post construction and safe system audits will be carried out to check that designs are maximising the DSI reduction potential. A series of project level Post Implementation Reviews will also occur across the state highway and local road programmes. This process measures the outcome achieved because of the project.

The Waka Kotahi Board will continue to receive an update at each meeting, provided by Transport Services and the Minister of Transport and Associate Minister of Transport will continue to receive quarterly updates.

Ongoing reporting will also be presented to the Waka Kotahi ELT on a selection of intervention and system performance indicators. These selections change each month and rotate quarterly (e.g., kilometres of median barriers installed).

In addition, it is proposed that an annual *Road to Zero* monitoring an outcomes report is developed and made publicly available to report progress on *Road to Zero*.

Figure 36 Reporting Arrangements



Quality Assurance and Continuous Improvement Mechanism

The *Road to Zero* SIP is monitored through an output, system performance and outcome-based performance management framework as outlined above. Various internal and external stakeholders are responsible for setting up, monitoring and evaluation outcomes and performance measures. Waka Kotahi pulls this information together for an overall annual performance report.

In addition, Internal Quality Assurance reporting is undertaken via the Planview system. Waka Kotahi Project Managers report project performance within Planview based on information from monthly contractor and consultant reports. The *Road to Zero* SIP will also be subject to internal and independent external reviews.

Risks, Constraints and Dependencies

Risks and Constraints

A risk register has been drafted to list all the identified risks, uncertainties and constraints and the results of their analysis and evaluation. Information on the status of the risk is also included. The risk register is intended to be continuously updated and reviewed throughout the course of the programme implementation.

Table 21 Risk Register

Risk Area	Details	Impact	Mitigation
COVID-19 Delivery	Resources may not be available to plan, design and build the projects	Failure to meet SIP and <i>Road to Zero</i> targets/outcomes	Post Covid programmes have been developed to inform the TAIP/WKIP process
	Reduced NLTP funding availability in the short to medium term	Reduced sector capacity i.e., construction/ labour pool availability in the next 6-12 months	Provide greater investment certainty/forward works programme over multiple NLTP periods to enable sector to increase capability and capacity
	Local share may decrease due to reduced revenue streams		
	A continuation of a slow start will result in a lumpy 10-year programme, creating a bow wave of work, increased costs, and risk of not delivering	More than \$500 million per year expenditure will severely challenge industry capacity and limit Waka Kotahi's ability to deliver	
Investment Certainty	Unable to secure investment at the rate required to achieve outcomes	Reduces the number of projects completed and viability of the programme	PBC to secure 2021-24 NLTP funding based on <i>Road to Zero</i> Activity Class
		Lack of funding available for projects	Increased investment required in NLTP 2 and 3
		Lack of a programme approach to funding	The cost and scope of the preferred programme has been developed to a PBC level. Further work will be completed to refine the scope and cost estimates for elements of the programme (at a package level) to draw down funding.
	GPS may change the focus for investment	Failure to meet SIP and <i>Road to Zero</i> targets/outcomes	
	Cost and scope certainty	The cost and scope of implementing the preferred programme is higher than expected in the PBC	
Procedural Alignment	Do not understand the consequence of challenging existing processes and changes to improve are not supported	Slower programme delivery and reduced DSI reduction outcomes	Management, governance, and delivery changes to improve programme outcomes are included in the PBC
		Negative impact on delivery and the Agency reputation	
SIP Resources	Do not secure the right capability and capacity to deliver the programme, Waka Kotahi restructure may impact the way the SIP is delivered	May need to slow down projects and reduce delivery. Will not meet SIP targets	PBC outlines the required programme resources required to deliver the safety outcomes sought in <i>Road to Zero</i>
	The inter-relationships with other programmes and timing of delivery E.g., the NZ Upgrade Programme will be competing for the same resources	Increased pressure on available resources and reduced ability to deliver within timeframes	

Reputation /Public Interest	Do not achieve a DSI reduction in a timely manner	Negative media coverage and reputational damage	A continuous monitoring and reporting framework are under development to identify issues and track progress against <i>Road to Zero</i> outcomes
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Dependencies

This PBC sets out the five focus area intervention programmes that are part of the *Road to Zero* Strategy and Action Plan, *Road to Zero* Activity Class expected investment, and governance framework. These focus area programmes, and the wider *Road to Zero* programme team, make up a large part of the work across the Safety, Health and Environment team and the SNP.

Integration with other work programmes and agencies is critical to delivering the *Road to Zero* outcomes.

- NZUP
- SRP
- NLTP
- Other *Road to Zero* Programmes

Further work to integrate the *Road to Zero* programme and SIP with other Waka Kotahi and local authority work programmes will be considered and managed by the *Road to Zero* Governance Group.

Commercial case

The commercial case outlines the procurement proposal for the recommended programme. *Road to Zero* has a multi-year investment profile, and many individual projects and interventions, the programme is complex and has a dependency on external suppliers.

Procurement Strategy

A procurement strategy has been developed which sets out the framework approach to how Waka Kotahi will manage the range of procurement activities needed to support the delivery of the SIP.

The purpose of this strategy is to guide procurement planning and decision making, and to set out a framework within which the programme's procurement can be managed and measured. The strategy is intended to be permissive, and to encourage innovation in pursuit of programme objectives.

This strategy has been endorsed by the Senior Manager Procurement and the SIP Steering Team and has been approved by the General Manager Transport Services. A copy of this procurement strategy can be found in Appendix E – Procurement Strategy.

Development of this strategy has been directly informed by Waka Kotahi's Infrastructure Procurement Strategy, which was endorsed by the Waka Kotahi Board in 2019.

Planning, sourcing, and managing are the three key broad phases of procurement that occur through the life of an asset or contract and provide the framework for how we will undertake procurement for the SNP.

This framework is illustrated in the government procurement lifecycle which identifies eight logical stages of activity. Waka Kotahi has adopted the language of 'plan, source, manage' to describe the key phases of procurement work, as described further within the Enterprise Procurement Strategy.

Figure 37 Plan, Source, Manage Framework



Plan

The Planning Phase of Procurement presents the greatest opportunity to identify and create opportunities for value. For infrastructure procurement, planning occurs at both a strategic and tactical level and is usually closely integrated with both investment and project management planning disciplines.

At a strategic level, this involves collaboration, consideration of opportunities for aggregation and smart packaging, assessment of risk and opportunity, and identifying the most appropriate contract delivery model. Tactical planning involves choosing the most appropriate supplier selection method, developing requirements and evaluation criteria, and the preparation of tender documentation.

Source

Having selected the most appropriate delivery model and supplier selection method, Waka Kotahi engage with potential suppliers receive and evaluate responses or offers and select the most appropriate supplier. Due diligence, refinement of requirements, negotiation of commercial terms, and developing of relationship and operating procedures may also form part of the sourcing phase.

Waka Kotahi considers the Sourcing Phase to be primarily tactical in nature, putting strategies into action through the consistent application of robust procurement procedures. This is the phase within which Waka Kotahi secure value.

Manage

After entering into an agreement with one or more suppliers, Waka Kotahi will onboard or induct the supplier, administer, and manage the contract and supplier performance, provide appropriate oversight and supervision, and continuously review the agreement. In the context of infrastructure asset improvement, often the management phase of procurement will occur under project management disciplines and allows Waka Kotahi to realise value, outcomes, and benefits.

Manage activity also includes the active monitoring and assessment of the performance and effectiveness of procurement strategies and plans, and the capturing and application of lessons and learnings.

The Procurement Plan

The SNP's requirements for advisory and professional services include support to programme management, business case development, pre-implementation activities including design and procurement, MSQA, and audit.

The primary approach to contracting for professional and advisory services is to utilise standing contract arrangements - including contracted consortia and panels – in order to achieve efficiencies in sourcing, as well as efficiency and consistency in work using suppliers able to build familiarity and expertise with the SSIs, internal methodologies, stakeholders and the programme team.

The use of consistent suppliers via standing arrangements will be balanced with creating opportunities for competition and building depth within regional professional service markets. The SIP is committed to developing and maintaining healthy professional services markets, especially at a regional level.

Approach to Procurement Planning

The planning phase of procurement is where many of the strategic decisions are made that ultimately influence the success of the project, and extent of value possible from any contract. This is especially important for physical works, where most of the funding is spent, risk is highest, and the extent of Client control lowest.

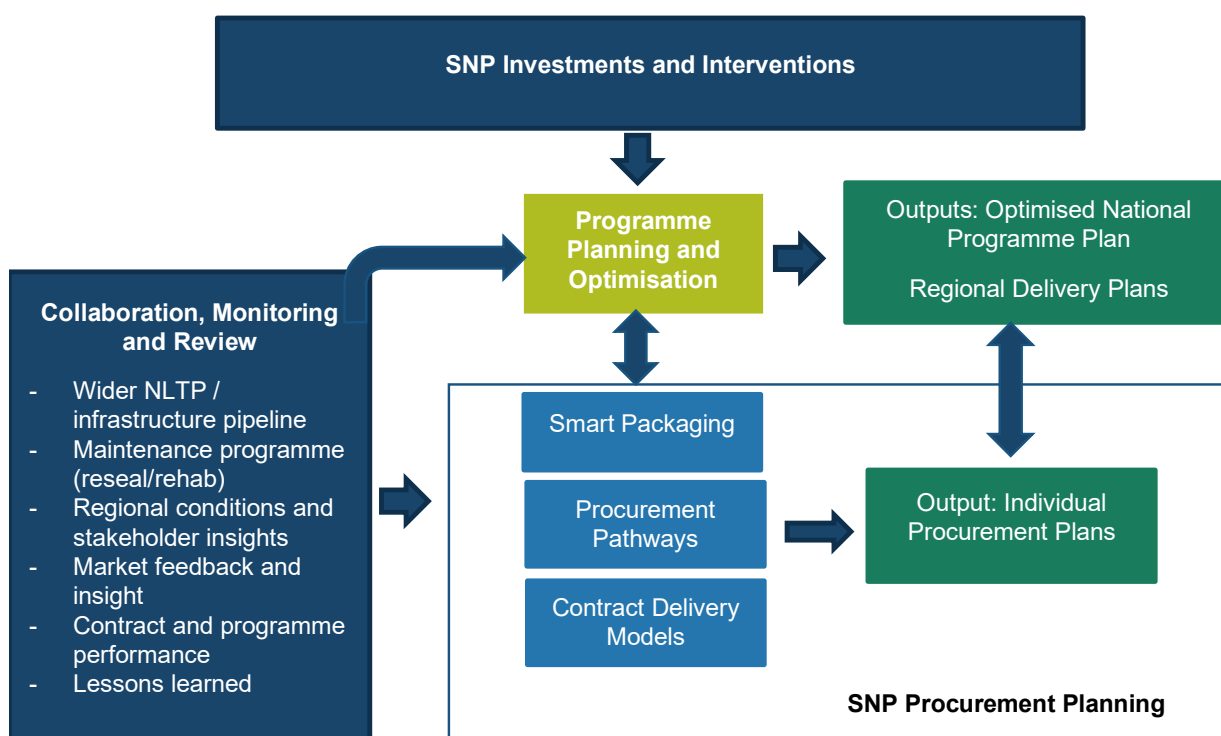
Key decisions are required within the planning phase of procurement, specifically including: the scope of work to package into a procurement activity, the procurement pathway to follow and if necessary, the selection of

the contract delivery model (e.g., form of contract) that will provide best value for money, and decisions about the supplier selection method to be used.

The pathways and guidance presented within this section of the Strategy are intended to apply to projects or physical works investment packages valued at \$50 million or less. Investments more than this level generally require a business case (including a commercial case which should seek to reconcile / align with this framework strategy where relevant).

The below diagram illustrates that planning for physical works procurement will be managed at a programme-level. The SNP's approach to Programme Optimisation will ensure that the physical works requirements from each sub-programme are identified and aligned with each other, (and the wider infrastructure programme), to take consideration of smart packaging options and procurement pathways, which will directly inform regional delivery plans and individual procurement plans.

Figure 38 Approach to SIP Physical Works Procurement Planning



Contract Delivery Models

Unless utilising a procurement pathway that provides an existing contract delivery model, the default approach to contracting for low cost low risk, or SSI physical works within the SIP is a traditional contract delivery model, utilising Waka Kotahi’s pro-forma version of NZS 3910:2013. Variants to the pro-forma contract should only be considered where there are non-standard requirements, and the SIP should strive to utilise standard and consistent versions of the agreement.

A traditional contract delivery model involves a ‘design then construct’ approach. Alternatives to this, such as Early Contractor Involvement (ECI), a collaborative contract, (such as an alliance), or a tailored contract delivery model should only be considered in extenuating circumstances, for example for a project >\$50 million where the Detailed Business Case (Commercial Case) identifies this as a preferred option, or where there are significant complexities or risks involved in integrating design and construction. In these cases, SIP will apply the guidance set out within the Contract Procedures Manual (SM021) and the Infrastructure Procurement Strategy. In all cases, the procurement pathway and contract delivery model, and the justification for selection, must be documented as part of procurement planning and approved by the appropriate delegation holder.

Procurement Responsibilities

In accordance with the internal Procurement Policy, and the SIP Programme Management Plan, the following accountabilities and responsibilities apply to procurement activity managed by the SNP. More detailed descriptions of responsibilities are set out within those documents.

Accountability: The General Manager for Transport Services is accountable for the planning, management, and outcomes of all procurement activity within the SNP, as well as the risks, benefits, and overall performance of SIP contracts.

Procurement Sponsor: Procurement Sponsors are responsible to the General Manager for the conduct and outcome of sourcing processes, including making best value for money judgements or recommendations on behalf of Waka Kotahi. The role of Procurement Sponsor is typically determined in accordance with the Delegations Framework, however for practical purposes within the SNP, the Portfolio Manager will assume these responsibilities – and utilise the Delegations Framework for formal contract decisions and approvals exceeding a Portfolio Manager's delegation.

Contract Owner: Each contract entered by the SIP must have a designated Contract Owner. Contract Owners must be an employee of Waka Kotahi and are responsible for the overall conduct and outcome of the relevant contract. The SIP Portfolio Manager is required to ensure that all SIP contracts are assigned to an appropriate Contract Owner, or for fulfilling these responsibilities directly.

Programme Governance/Steering Team: In support of the SIP investment objectives, Transport Services have established a specialist Programme Team with dedicated resourcing and governance structure, including a Programme Steering Team. In a procurement context, the SIP Steering Team is responsible for supporting the SIP Portfolio Manager to implement this Strategy, fulfil the above responsibilities, and provide assurance to the General Manager.

The Safer Networks Programme Management Plan, and/or individual procurement plans (including those for the management of Consortia or Panels) may assign more specific responsibilities or authority to the Steering Team.

Centre of Excellence: Under the Senior Manager Procurement, the Procurement Centre of Excellence (Enterprise Procurement Team) within Corporate Support is responsible for the overall performance of Waka Kotahi's procurement function – including providing access to expert procurement and commercial advice.

In support of the SNP, the Enterprise Procurement Team will:

- Provide a senior representative to serve on the SIP Steering Team or equivalent governance group
- Support (or manage) the engagement and technical supervision of 3rd parties undertaking procurement work for the programme
- Provide routine advice and support in application of procedure manuals, policies, and procurement standards
- Promptly and efficiently exercise procurement related delegations
- Lead formal industry engagement/communication activities, aligned to the wider infrastructure programme
- Either provide (or support recruitment and management) of a Procurement Lead for SNP
- Support the review and maintenance of this Strategy.

Procurement Lead: The SIP Portfolio Manager and the Enterprise Procurement Team will agree on the appointment of a Procurement Lead for the SNP. Noting the scale, complexity, and ongoing value of SIP procurement – this role is a critical enabler of success.

Financial case

The Financial Case focusses on the costs and revenues associated with the SIP. The financial impact of the recommended SIP should be considered in the context of the benefits and value it realised for New Zealand communities.

Government Policy Statement Funding

The Government Policy Statement (GPS) is reviewed every three years and guides investment in transport by providing a ten-year outlook of how spending is prioritised in the transport network. Guided by the GPS strategic priorities, Waka Kotahi supports local government to create Regional Land Transport Plans (RLTP's), which are used to create the National Land Transport Programme (NLTP).

GPS 2021 has updated National Land Transport Fund (NLTF) activity classes. The *Road to Zero* activity class is new, bringing together the existing safety related activity classes. Investment through the *Road to Zero* activity class will be targeted towards interventions that are key to achieving the target reductions in DSI's.

In the government commitments section of the GPS, there is an investment expectation of at least \$10 billion from the National Land Transport Fund for *Road to Zero* between 2021/22 -2030/31, with the estimated investment under each reporting line as shown in Figure 39.

Figure 39 Activity Class Funding Ranges 2021-31

Activity class	Expenditure reporting line	GPS 2021 funding ranges						Forecast funding ranges					
		2021/22 \$m	2022/23 \$m	2023/24 \$m	2024/25 \$m	2025/26 \$m	2026/27 \$m	2027/28 \$m	2028/29 \$m	2029/30 \$m	2030/31 \$m		
Road to Zero	Safety infrastructure	Upper Lower	910	940	980	1000	1040	1070	1080	1110	1140	1170	
	Road policing		820	840	870	900	930	960	970	1000	1020	1050	
	Automated enforcement												
	Road safety promotion												

The *Road to Zero* activity class is split into continuous programmes and improvement activities, whilst not defining what amount is spent on either. Initial moderation of continuous programmes and committed activity from the previous NLTP period occurs ahead of new improvement activities, to maintain existing levels of service. Three components relate to maintaining existing levels of service within the *Road to Zero* activity class:

- Automated enforcement (existing camera and infringement processing)
- Road safety partnership programme
- Road safety promotions.

New improvement activities can come from any of the four expenditure reporting lines shown in Figure 39. The recommended programme will be funded through the NLTF and local authority budgets.

Road to Zero Activity Class Funding 2021-24

The Waka Kotahi Investment Proposal shows that the *Road to Zero* activity class is a constraint on the cashflow required for the SIP for the ten-years, as shown by Figure 40. The effect of changes of investment available is significant and results in a change in the composition of the programme.

The current submitted Waka Kotahi Investment proposal reflects an achievable and affordable *Road to Zero* SIP for 2021-24 of sufficient size to deliver the 40 percent DSI reduction by 2031. However, there are challenges we face because of a lower level of investment in the first NLTP period.

An overview of the proposed cashflow for the 2021-24 NLTP is provided in Table 22.

Table 22 2021-24 Cashflow Forecast

Programme Element	2021/22	2022/23	2023/24
Highway Programme New Initiatives	\$37 million	\$164 million	\$291 million
Highway Programme Draft Phases on In-Flight Initiatives	\$241 million	\$98 million	\$19 million
Local Road Programme New	\$86 million	\$86 million	\$86 million
Totals	\$363 million	\$348 million	\$395 million

Long Term Investment

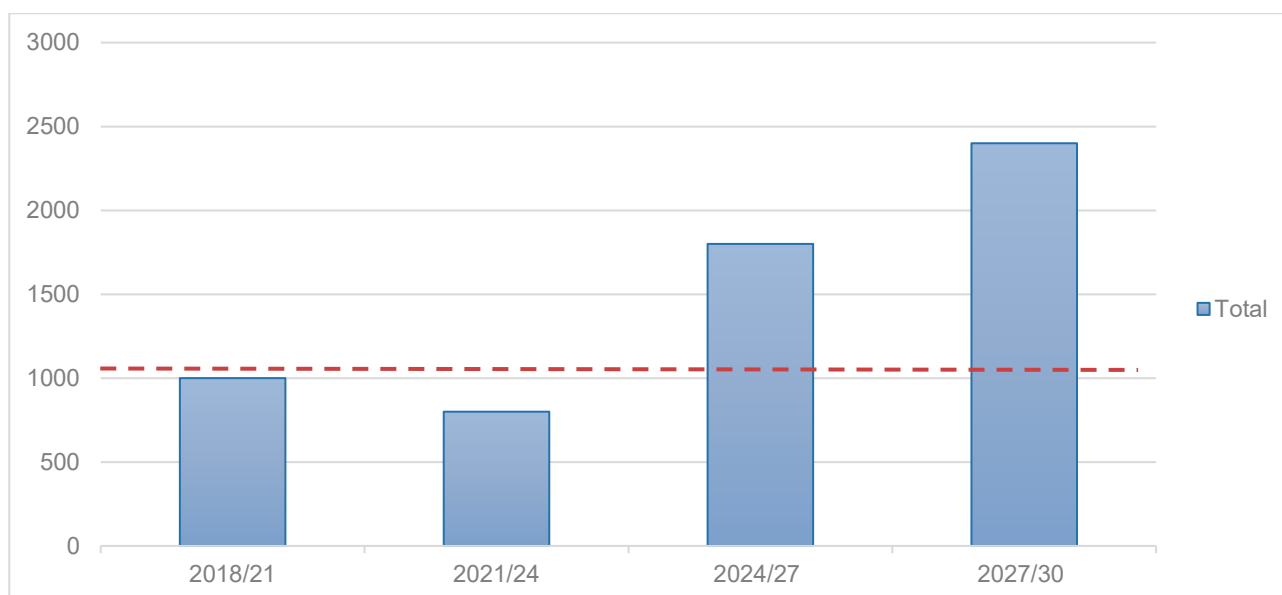
The SIP is viable, however, delivery of the *Road to Zero* outcomes from the SIP is dependent on investment of approximately \$5 billion over ten years as shown in Figure 40. Investment decisions by Waka Kotahi and the government over the life of the *Road to Zero* Strategy could have a significant impact on the ability to deliver on *Road to Zero*. Any reduction in funding over the ten years, will have a direct impact on the delivery of outcomes.

2021-24 Activity Class Funding Availability

A new activity class, *Road to Zero* activity class, was proposed to fund all safety activities to enable the successful delivery of the *Road to Zero* Strategy and better management of the road safety budget. However, because of Covid-19, funding for the *Road to Zero* activity class is likely to be less than the Strategy anticipated. Alongside this, as mentioned above, the Covid-19 situation has also affected Local Authority funding levels. These funding issues have had a significant impact on the development of the delivery of this programme.

This PBC has been developed based on available activity class funding for NLTP 1. It is recognised that additional investment in NLTP 1 would greatly reduce the risk of under delivery, as the delivery risk is spread over time. Without additional investment in NLTP 1, increased funding over and above that currently identified in the Waka Kotahi Investment Proposal will be needed in NLTP 2 and 3 to meet the SIP output and outcome expectations as identified in the *Road to Zero* Strategy as shown in Figure 40.

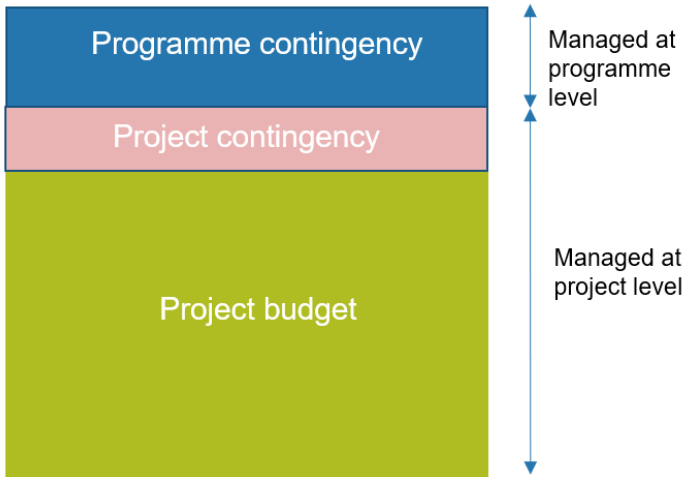
Figure 40 Potential SIP Funding Scenario (\$5 billion over ten years)



Cost Contingency Approach

The *Road to Zero* programme contingency will be managed across project and programme level. Emulating the contingency approach for the NZUP programme, the SIP will manage scope and cost change as outlined by the SIP programme and project controls framework. The current contingency at a programme level is 15 percent and 5 percent at the project level. This is supported by the recently adopted NZUP Contingency Policy (where pragmatically appropriate).

Figure 41 Split and Management of Contingency Across Project and Programme Levels



Further work to document and agree the way cost contingency is managed at both a programme and project level will be progressed over the next six months, prior to the 2021-24 NLTP period. This information will then be presented to the *Road to Zero* Governance Group to enable a decision.

Next steps

Following Waka Kotahi Board approval, packages of projects within the SIP Delivery Programme will be further developed and funding will be sought to progress and implement each package of safety improvements on the state highway and local road network.

The key objective is to secure programme funding for the SIP Delivery Programme, and to confirm that this funding is available from the start of the 2021-24 NLTP period (1 July 2021).

Figure 42 Next Steps Timeline



Following Board endorsement of the *Road to Zero* SIP PBC ten-year Strategic Implementation Programme and 2021-24 SIP Delivery Programme, the focus will be to begin the programme development and delivery process in earnest to maximise the outputs in the 2021-24 NLTP period and create strong momentum for the ten-year programme.

The SIP team will focus on driving the investment application process over the next six months. This phase will clarify the process, roles, and responsibilities to progress through the project lifecycle from programme development to feasibility / pre-implementation to begin with. It will test requirements and programme processes, identify people, process and technology, resourcing, and engage with stakeholders and governance to achieve robust, efficient workflows.

Pilot projects will be undertaken early to provide the opportunity to demonstrate proof of concept and refine the processes, templates, systems, and resourcing decisions prior to scaling up the programme delivery.

It is anticipated this will lead to funding applications going through the approval process in time to meet the beginning of the 2021-24 NLTP period.

APPENDICES

Appendix A – DSI Reduction Options Considered for a 2030 Target

Initial modelling has helped us to build a sense of the scale of change and investment needed to meet different targets. It is not intended to provide sufficient detail to prescribe specific policy interventions or investments at the level of a business case. Depending on the level of ambition adopted for consultation, further work will be done to refine the modelling and to outline in more detail the proposed investment programme for the next 3 years.

Modelling suggests that a business as usual approach to road safety will only reduce deaths and serious injuries (DSI) by about 10% by 2030

If safety improvements to our roads, vehicle fleet and behaviour continue in line with past interventions and activity levels then in the year 2030 we would expect around 2,900 DSI (a 10% reduction). The modelling takes into account projected economic conditions, demographic changes and global factors (e.g. petrol prices), and assumes that existing trends in the safety of the vehicle fleet, roads and user behaviour will continue to incrementally improve, reflecting continued investment at previous NLTP levels in infrastructure improvements and enforcement etc.

2030:
227 fewer deaths (151 remaining)
1,680 fewer serious injuries (1,120 remaining)

The majority of the gains are likely to come from effort and investment in the following proven types of interventions:

- *infrastructure improvements* (e.g. median barriers, intersection treatments)
- *increased enforcement*, both automated (i.e. safety cameras) and police officer presence for speed, and enhanced roadside testing for alcohol
- *speed limit changes* in urban areas and on the highest risk parts of the network

Key risks:

- Infrastructure
 - Subject to capacity constraints and reliant on efficient delivery across the sector
 - Reliant on sufficient ring-fencing of safety spending and investment decision making frameworks (IAF/EEM) adequately prioritising safety
 - Strong interaction with the development of speed management plans
- Speed:
 - Requires both efficient limit setting processes and effective enforcement
 - Current back-office systems for automated enforcement are outdated and will require significant investment
 - Additional cameras, signage and education will require phasing in.

These risks are more pronounced for more ambitious levels of investment.

There is also good evidence that reducing the number of less safe vehicles in the fleet would also significantly reduce deaths and serious injuries

Key risks

- Reliant on substantially increasing vehicle safety standards relatively early in the life of the strategy.
- Changes to vehicle standards will need to take account of any increases in vehicle costs, including social equity impacts.
- There are limited cost-effective options for removing less safe vehicles from the fleet.

The remaining contribution could come from a range of other interventions that have not been modelled, but that are known to have an impact on road safety outcomes.

Key risks

- The scale of impact of each of these factors is much less certain.
- Mode shift impacts dependent on investment in other modes, including public transport and rail, and greater separation for active modes.
- While there are some opportunities to improve driver skills and education, evidence suggests these have relatively small impacts.

30%
2030:
113 fewer deaths (265 remaining)
840 fewer serious injuries (1,960 remaining)

Infrastructure, Speed and Enforcement: 10-15% DSI reduction contribution

Key assumptions:

Order of magnitude safety spend: ~\$7-8 billion over ten years (similar to current levels).

NLTF share: ~\$6-7 billion

~\$4.35b non-discretionary*
~\$2.2b discretionary spending (approx 18% of discretionary spending at current tax levels)

Local share: ~\$0.6 billion**

~\$4 billion safety infrastructure

- At level of Safe Networks Package, including speed management costs

~\$3.85 billion enforcement

- Ongoing operational improvements to officer-led road policing within projected spending levels.

Speed regulatory changes

- Speed reductions to highest risk part of the network and in high active mode areas, including urban centres and around schools.

40%
2030:
151 fewer deaths (227 remaining)
1,120 fewer serious injuries (1,680 remaining)

Infrastructure, Speed and Enforcement: 15-20% DSI reduction contribution

Key assumptions:

Order of magnitude safety spend: ~\$9-10 billion over ten years (25% increase on current levels).

NLTF share: ~\$8-9 billion

~\$4.35b non-discretionary*
~\$4.2b discretionary spending (approx 33% of discretionary spending at current tax levels)

Local share: ~\$0.8 billion**

~\$5 billion safety infrastructure

- Treatment of additional high risk corridors with median barriers, intersection improvements, wider centre lines etc.
- Speed management costs

~\$4.1 billion enforcement

- Ongoing operational improvements to officer-led road policing within projected spending levels.
- Substantial increase to automated enforcement by 2030

Speed regulatory changes

- Speed reductions to highest risk part of the network and in high active mode areas, including urban centres and around schools.

50%
2030:
189 fewer deaths (189 remaining)
1,400 fewer serious injuries (1,400 remaining)

Infrastructure, Speed and Enforcement: 25-30% DSI reduction contribution

Key assumptions:

Order of magnitude safety spend: ~\$11-12 billion over ten years (50% increase on current levels)

NLTF share: ~\$10-11 billion

~\$4.35b non-discretionary*
~\$6.2b discretionary spending (approx 50% of discretionary spending at current tax levels)

Local share: ~\$1.2 billion**

~\$7 billion safety infrastructure

- Ambitious improvements indicatively including:
 - 850km additional median barriers
 - 3500 intersection treatments
 - Extensive other corridor treatments, including rumble strips, wider centre lines
- Speed management costs

~\$4.6 billion enforcement

- Approximately doubling current levels of officer-led speed enforcement and roadside impairment testing by 2030
- Widespread automated enforcement network by 2030

Speed regulatory changes

- Speed reductions to highest risk part of the network and in high active mode areas, including urban centres and around schools.

Infrastructure, Speed and Enforcement: 30-35% DSI reduction contribution

Key assumptions:

Order of magnitude safety spend: ~\$12-13 billion over ten years (65% increase on current levels)

NLTF share: ~\$11-12 billion

~\$4.35b non-discretionary*
~\$7.2b discretionary spending (approx 58% of discretionary spending at current tax levels)

Local share: ~\$1.3 billion**

~\$8 billion safety infrastructure

- Ambitious improvements including:
 - 1000km additional median barriers
 - 4000 intersection treatments
 - Extensive other corridor treatments, including rumble strips, wider centre lines
- Speed management costs

~\$4.6 billion enforcement

- Approximately doubling current levels of officer-led speed and roadside impairment testing by 2030
- Widespread automated enforcement network by 2030

Speed regulatory changes

- Speed reductions to highest risk part of the network and in high active mode areas, including urban centres and around schools.
- Additional speed reductions may be required.

Vehicle safety improvements: 10 – 15 % DSI reduction contribution

Key assumptions

- Safety requirements for new and used vehicles entering the fleet are increased, equivalent to preventing 1 and 2 star vehicles from entering the fleet from 2022.
- Antilock Braking Systems mandated for all new motorcycles from 2020 and used motorcycles entering the fleet from 2021.
- Take action where possible to reduce the number of less safe vehicles remaining in the fleet by 2030.

Other interventions and supporting factors: 5-15% DSI reduction contribution

- Mode shift to safer public transport, freight to rail and coastal shipping and corridor separation for action modes would have a positive impact on road safety over the next ten years, potentially increasing over the longer term, as well as delivering a range of broader benefits. We have assumed a moderate impact in the first ten years because we need to deliver substantial infrastructure and service delivery improvements and make sustained changes to transport choices on the part of road users.
- Any measures that reduce total vehicle kilometers travelled, including mode shift, can be expected to have a positive impact on road safety.
- Improvements in technology, including active driver assistance technology in vehicles, some level of vehicle automation and connected vehicle technology could have a significant impact on road safety. However the scale of these impacts and the pace of change is highly uncertain.
- A range of other initiatives, including strengthening work-related road safety, strengthening enforcement tools for drug driving, more effective penalties and remedies and improvements to licensing, training and education

* Non-discretionary spending has been defined as already contracted or minimum spending required to maintain existing levels of service.

** Local share contribution is indicative and dependent on the proportion of improvements on local roads and the financial assistance rate for a particular council

Appendix B – SIP Strategic Model Methodology

Development of the Road to Zero Infrastructure & Speed Management Strategic Programme

Prepared for: Fabian Marsh
Job Number: NZTA-J161
Revision: B
Issue Date: 19 March 2020
Prepared by: Paul Durdin, Transportation Group Manager

1. Background

Technical Note provides detail on the methodology used to develop a strategic level Infrastructure and Speed Management Programme to inform the Road to Zero national road safety strategy target setting.

The Road to Zero Infrastructure and Speed Management Strategic Programme forms part of a more holistic analysis that has informed New Zealand's Road Safety Strategy 2020-30 [Road to Zero](#), which proposes a target of a 40% reduction in deaths and serious injuries over the next ten years. This strategic programme, in combination with modelling undertaken using the Integrated Intervention Logic Model (IILM) to inform the target, estimated that approximately half of the benefits will come from speed and infrastructure interventions (this is referred to as the Road to Zero Infrastructure and Speed Management Strategic Programme), with the other 50% coming from improved vehicle technology, enhanced enforcement and the safer choices and behaviour of road users in the road system.

With approximately 3,200 people being killed and seriously injured on New Zealand's road system in 2018, the Road to Zero Infrastructure and Speed Management Strategic Programme aims to achieve a reduction of around 600 to 650 DSi.

2. Methodology

The Road to Zero Infrastructure and Speed Management Strategic Programme is based on the national road safety dataset that sits behind the Safer Journeys Risk Assessment Tool, better known as Mega Maps.

2.1 Interventions

The interventions considered in the Road to Zero Infrastructure and Speed Management Strategic Programme include:

- Top 10% GPS High-Benefit Opportunities for speed management measures;
- Infrastructure interventions on rural corridors and
- Infrastructure interventions at urban and rural intersections.

Speed Management

The Top 10% GPS High-Benefit Opportunities identified in Mega Maps provides a distinction between corridors where speed limit reduction is likely to be the most appropriate measure (Challenging Conversations) and corridors where investment to improve the safety performance of the corridor to a standard where a higher speed limit is likely to be justifiable (Engineer Up). Within the Road to Zero Infrastructure and Speed Management Strategic Programme, the speed management approach applied to all of the Top 10% GPS High-Benefit Opportunity corridors is speed limit

reduction. On some corridors, additional infrastructure interventions are also considered where certain criteria are satisfied, as described in the following section.

Infrastructure Interventions on Rural Corridors

The infrastructure interventions that have been evaluated for rural corridors are:

- **Safe System Transformation** – this intervention assumes a central wire rope median barrier system with side barrier where practicable. This is known as a ‘Primary’ Safe System treatment.
- **Supporting Safe System Treatment (medium cost)** – this intervention covers a range of measures that move a corridor towards a safe system environment, such as wide centreline treatment, carriageway widening, roadside hazard removal/protection etc. This is known as a ‘Supporting’ Treatment, which moves towards better Safe System alignment and is compatible with the future implementation of Primary Safe System Treatments.
- **Supporting Safe System Treatment (low cost)** – this intervention covers a range of measures that improve safety outcomes but do not materially change the IRR / Star Rating of the corridor. Interventions include measures such as audio tactile paving (ATP), enhanced delineation, improved surface friction etc. This is known as a ‘Supporting’ Treatment, which does not affect the future implementation of Primary Safe System Treatments.

The above Intervention categories have been assigned to corridors based on the following criteria.

Intervention	Criteria
Safe System Transformation	<ul style="list-style-type: none"> • Corridor length > 2km • AADT > 6,000 vpd • Speed limit ≥ 80km/h • Road stereotype ≠ Divided – non traversable or Unsealed • Estimated or Predicted Collective Risk ≥ Medium-High
Supporting Safe System Treatment (medium cost)	<ul style="list-style-type: none"> • Corridor length > 2km • AADT > 3,000 vpd • Speed limit ≥ 80km/h • Road stereotype ≠ Divided – non traversable or Unsealed • Estimated or Predicted Collective Risk ≥ Medium
Supporting Safe System Treatment (low cost)	<ul style="list-style-type: none"> • Corridor length > 2km • Speed limit ≥ 80km/h • Road stereotype ≠ Unsealed • Estimated or Predicted Collective Risk ≥ Medium

A hierarchical approach is applied to the assignment of interventions to a corridor in the order listed above. That means, if a corridor satisfies the criteria for ‘Safe System Transformation’ then it is ineligible for classification as ‘Supporting Safe System Treatment’ either medium or low cost. One exception applies to this rule for corridors assigned with the ‘Safe System Transformation’ intervention where the estimated DSI saved per \$100m investment is low, meaning they would be excluded from inclusion in the Road to Zero Infrastructure and Speed Management Strategic Programme (refer Section 4). In these instances, the corridor is also assessed for inclusion in the Road to Zero Infrastructure and Speed Management Strategic Programme with a ‘Supporting Safe System Treatment (medium cost)’ intervention. An iterative approach was used to determine the threshold for classification of a low return on investment.

Infrastructure Interventions at Intersections

The infrastructure interventions that have been evaluated for intersections are:

- **Rural Safe System Transformation** – this intervention involves the upgrade of a priority-controlled intersection to a roundabout. This is known as a ‘Primary’ Safe System treatment.

- **Rural Supporting Safe System Treatment (medium cost)** – this intervention is based on safety improvements to existing roundabouts achieved through design enhancements or speed management measures, such as raised platforms. This is known as a ‘Supporting’ Treatment, which does not affect the future implementation of Primary Safe System Treatments.
- **Rural Supporting Safe System Treatment (low cost)** – this intervention is based on treatments such as RIAWS, Vehicle Activated Stop Signs, provision of turning bays, improved visibility etc. This is known as a ‘Supporting’ Treatment, which does not affect the future implementation of Primary Safe System Treatments.
- **Urban Safe System Transformation** – this intervention involves the upgrade of a priority-controlled intersection to a roundabout. This is known as a ‘Primary’ Safe System treatment.
- **Urban Supporting Safe System Treatment (medium cost 1)**– this intervention is based on safety improvements to existing roundabouts achieved through design enhancements or speed management measures, such as raised platforms. This is known as a ‘Supporting’ Treatment, which does not affect the future implementation of Primary Safe System Treatments.
- **Urban Supporting Safe System Treatment (medium cost 2)**– this intervention involves upgrading a signalised intersection on a raised platform to control vehicle entry speeds. The intervention may or may not be supplemented by modifications to signal phasing to fully control right-turn movements. This is known as a ‘Primary’ Safe System treatment.
- **Urban Supporting Safe System Treatment (low cost)** – this intervention involves removing all right turn movements at a priority-controlled T-intersection where the side road has the lowest mobility function i.e. Access classification. This is known as a ‘Supporting’ Treatment, which moves towards better Safe System alignment and is compatible with the future implementation of Primary Safe System Treatments.

The above Intervention categories have been assigned to intersections based on the following criteria.

Intervention	Criteria
Rural Safe System Transformation	<ul style="list-style-type: none"> • Speed limit \geq 80km/h • Intersection Type \neq roundabout • Collective Risk \geq Medium • GHJKLN injury crashes \geq 3 in last 10 years
Rural Supporting Safe System Treatment (medium cost)	<ul style="list-style-type: none"> • Speed limit \geq 80km/h • Intersection Type = roundabout • Collective Risk \geq Medium-High
Rural Supporting Safe System Treatment (low cost)	<ul style="list-style-type: none"> • Speed limit \geq 80km/h • Intersection Type is priority controlled • GHJKLN injury crashes \geq 2 in last 10 years
Urban Safe System Transformation	<ul style="list-style-type: none"> • Speed limit \leq 70km/h • Intersection Type is priority controlled • Collective Risk \geq Medium • GHJKLN injury crashes \geq 3 in last 10 years • All legs have ONRC $>$ Access • Number of legs \geq 4
Urban Supporting Safe System Treatment (low cost)	<ul style="list-style-type: none"> • Speed limit \leq 70km/h • Intersection Type is priority controlled • Intersection Form is T (3-leg) • Priority leg ONRC \geq Arterial • Side road ONRC = Access • GHJKLN injury crashes \geq 2 in last 10 years

Intervention	Criteria
Urban Supporting Safe System Treatment (medium cost 1)	<ul style="list-style-type: none"> Speed limit ≤ 70km/h Intersection Type = roundabout Collective Risk ≥ Medium-High
Urban Supporting Safe System Treatment (medium cost 2)	<p><u>For platforms</u></p> <ul style="list-style-type: none"> Speed limit ≤ 70km/h Intersection Type ≠ roundabout GHJKLN injury crashes ≥ 3 in last 10 years Collective Risk ≥ Medium <p><u>For right-turn filter removal</u></p> <ul style="list-style-type: none"> Intersection Type is signals Right turn against crashes > 20% of all crashes Right turn against crashes ≥ 3 in last 10 years Collective Risk ≥ Medium

A hierarchical approach is applied to the assignment of interventions to an intersection in the order listed above. As with corridors, an exception to this rule is applied to intersections assigned with the ‘Rural Safe System Transformation’ intervention where the estimated DSI saved per \$100m investment is low, meaning they would be excluded from inclusion in the Road to Zero Infrastructure and Speed Management Strategic Programme (refer Section 4). In these instances, the intersection is also assessed for inclusion in the Road to Zero Infrastructure and Speed Management Strategic Programme with a ‘Rural Supporting Safe System Treatment (low cost)’ intervention. An iterative approach was used to determine the threshold for classification of a low return on investment.

It is important to note that the ‘Right Turn Filter Removal’ intervention can be assigned in conjunction with the ‘Urban Platform’ intervention. In those instances, the benefits attributable to the ‘Right Turn Filter Removal’ component are based on the estimated DSI remaining following introduction of the ‘Urban Platform’ so as not to double-count benefits.

2.2 Benefits and Costs

The assessment has been undertaken using the Mega Maps corridors as the base data, updated with 2014-2018 crash data and refined DSI severity indices, including speed scaling factors. As safety performance across the network was not uniform during the 2014-18 period, base safety statistics were factored to 2018 values, so safety benefits are reported against present day performance i.e. ~3,200 DSI in 2018.

Because many of the infrastructure interventions are situated on corridors that in the Top 10% GPS High-Benefit opportunity corridors, the safety benefits associated with infrastructure interventions have been calculated on the assumption that speed management measures are in place i.e. the infrastructure benefits apply to the residual risk following speed management intervention. A summary of the benefit calculation methodology and costs associated with each speed management and infrastructure intervention are summarised in the following table.

Feature	Intervention	Benefit Calculation	Cost	Comments
Corridors	Top 10% GPS	Nilsson’s Power Model	Maximum of \$100,000 per corridor or \$20,000 per km.	
	Safe System Transformation	65% DSI reduction	\$2.6m per km including maintenance costs	Benefits calculated based on residual DSI after Top 10% GPS
	Supporting Safe System Treatment (medium cost)	30% DSI reduction	\$1.25m per km including maintenance costs	
	Supporting Safe System Treatment (low cost)	15% DSI reduction	\$0.4m per km including maintenance costs	

Feature	Intervention	Benefit Calculation	Cost	Comments
Intersections	Rural Safe System Transformation	70% DSi reduction	\$3.3m per site including maintenance costs	Benefits adjusted by applying a DSi speed scaling factor (refer table below) for intersections situated on corridors in the Top 10% GPS
	Rural Supporting Safe System Treatment (medium cost)	40% DSi reduction	\$0.5m per site including maintenance costs	
	Rural Supporting Safe System Treatment (low cost)	35% DSi reduction	\$0.33m per site including maintenance costs	
	Urban Safe System Transformation	60% DSi reduction	\$1.65m per site including maintenance costs	
	Urban Supporting Safe System Treatment (low cost)	60% DSi reduction	\$0.25m per site including maintenance costs	
	Urban Supporting Safe System Treatment (medium cost 1)	40% DSi reduction	\$0.5m per site including maintenance costs	
	Urban Supporting Safe System Treatment (medium cost 2)	<u>For platforms</u> 40% DSi reduction <u>For right-turn filter removal</u> 35% reduction in injury crashes. DSi reduction estimate based on severity index of Type L crashes for intersection type.	<u>For platforms</u> \$0.44m per site including maintenance costs <u>For right-turn filter removal</u> \$0.20m per site. No additional maintenance costs assumed.	

Speed scaling factors are applied to intersection interventions situated on corridors in the Top 10% GPS so DSi reduction benefits are based on the residual DSi remaining after speed management measures are in place. The DSi speed scaling factors for various before and after speed limit combinations are shown below.

Speed Limit Before (km/h)	Speed Limit After (km/h)	DSi Speed Scaling Factor
100	80	0.71
100	60	0.59
80	60	0.83
80	≤50	0.72
70	60	0.88
70	≤50	0.77
60	≤50	0.87

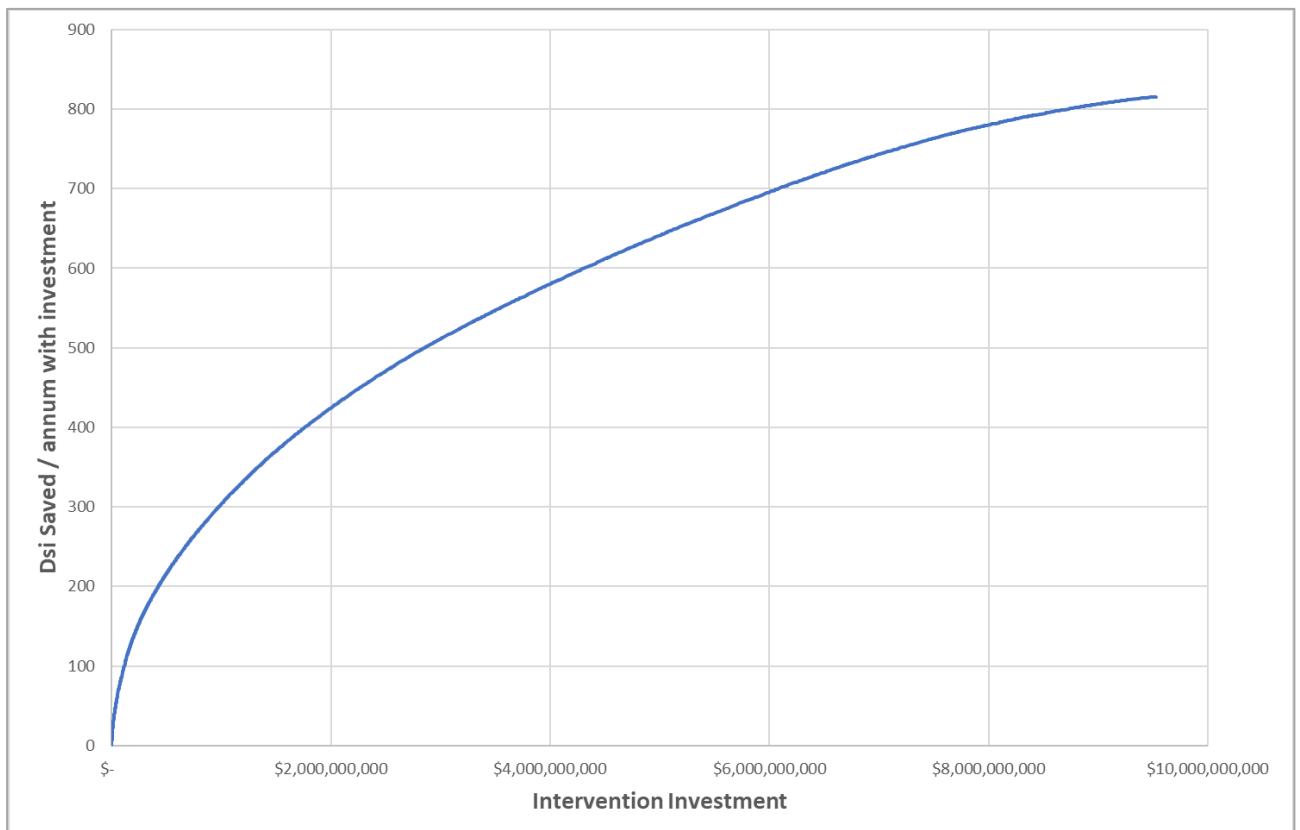
3. Results

A summary of some key metrics associated with application of the criteria (in terms of network targeted) described in Section 2 of this Technical Note are presented in the following table.

Metric	Value	Proportion of National
Corridor Length	12,068 km	12.7%
Corridor VKT	20.5B VKT / annum	47.1%
Corridor DSi	1,407 DSi / annum	44.8%
Intersections	2,567 intersections	3.1%
Intersection DSi	533 DSi / annum	36.2%
All DSi	~ 1,705 DSi / annum	54.4%

The table above shows that interventions satisfy the criteria for a comparatively small part of the national road network (12.7% of corridors by length and only 3.1% of all intersections) yet target slightly less than half of all travel (47.1%) and more than half (54.4%) of all DSi. The overall proportion of DSi targeted (54.4%) has been estimated by reviewing the proportion of intersection interventions that are situated on corridors that include either a speed or infrastructure intervention

The DSi saved per \$100m of investment was calculated for each speed management, corridor and intersection infrastructure intervention, and ranked from most to least cost efficient, as shown below.



The above chart shows an investment of \$9.5B would be required to deliver a safety benefit of 815 DSi saved per annum. The indicative safety only BCR of this investment is 1.75.

A reduction of 815 DSi per annum equates to a 26.0% reduction in all DSi using the 5-year average from 2014-2018 factored to 2018 values.

The previous chart shows that in order to achieve a DSi reduction of approximately 640 i.e. 20% of the current 3,200 DSi from 2018, an investment of approximately \$5bn would be required.

The level of investment required to achieve incremental reductions of 100 DSi per annum is shown in the following table.

DSi Saved / Annum	Investment (\$m) / Running Total (\$m)	DSi Saved per \$100m / Running Total
0 – 100	\$114	87.7
100 – 200	\$311 / \$425	32.2 / 47.1
200 – 300	\$551 / \$976	18.1 / 30.7
300 – 400	\$792 / \$1,768	12.6 / 22.6
400 – 500	\$1,086 / \$2,854	9.2 / 17.5
500 – 600	\$1,464 / \$4,318	6.8 / 13.9
600 – 700	\$1,801 / \$6,119	5.6 / 11.4
700 – 800	\$2,609 / \$8,728	3.8 / 9.2
800 – 815	\$804 / \$9,532	1.9 / 8.6

4. Road to Zero Infrastructure and Speed Management Strategic Programme

Based on the preceding analysis, which is based on an optimised programme of individual elements (projects) prioritised on the basis of DSI saved per \$100m of investment, various programme compositions were explored to inform the final strategic programme. The Road to Zero Infrastructure and Speed Management Strategic Programme that was adopted is shown in the following table.

Feature	Intervention	Number / Length (km)	DSi Saved	Cost (to nearest \$5 million)
Corridor	Speed Management	4,730 km ** (7,290 km) ***	93 **** (253) *****	\$205,000,000
	Rural Safe System Transformation	999 km	129	\$2,600,000,000
	Rural Supporting Safe System Treatment (medium cost)	207 km	8	\$260,000,000
	Rural Supporting Safe System Treatment (low cost)	1,676 km	27	\$670,000,000
	Sub-Total	7,612 km	417	\$3,730,000,000
Intersection	Rural Safe System Transformation	81	27	\$265,000,000
	Rural Supporting Safe System Treatment (medium cost)	15	2	\$10,000,000
	Rural Supporting Safe System Treatment (low cost)	511	29	\$170,000,000
	Urban Safe System Transformation	81	13	\$135,000,000
	Urban Supporting Safe System Treatment (low cost)	403	24	\$100,000,000
	Urban Supporting Safe System Treatment (medium cost 1)	1,155	113	\$560,000,000
	Urban Supporting Safe System Treatment (medium cost 2)	80	10	\$40,000,000
	Sub-Total	2,326 int	218	\$1,280,000,000
Total	2,326 int / 7,612 km	635	\$5,010,000,000	

* Treatment is applied a further 253 intersections that are also covered by the 'Urban Platform' intervention. Safety benefits of this intervention are included as part of the 'Urban Platform' intervention.

** Length of network subject to lower speed limit treatment only

*** Total length of network subject to lower speed limit, including overlap with infrastructure interventions.

**** DSI saved where lower speed limits is the only intervention.

***** DSI saved due to lower speed limits, including corridors with an infrastructure intervention.

The preceding chart and table shows an investment of approximately \$5 billion, is expected to deliver a benefit of 635 DSI saved per annum. The indicative safety BCR of this investment is 2.59.

It is important to appreciate that the programme has been developed at a strategic level to provide indicative estimates, and ground-truthing will be required to establish the exact nature of interventions, costs and safety benefits for each element within the programme. The figures presented in this report are indicative of what a programme of speed management and infrastructure interventions of a particular scale may cost and could achieve in terms of DSI saved.

Appendix C – BCR Sensitivity Test Methodology

Road Safety Infrastructure and Speed Management - Programme Level Benefit Cost Analysis for the Road to Zero Strategic Road Safety Programme

Prepared for: Christine McKinlay, Waka Kotahi NZ Transport Agency

Job Number: NZTA-J214

Revision: B - DRAFT

Issue Date: 26 January 2021

Prepared by: Carl O'Neil, Principal Transportation Engineer

Reviewed by: Paul Durdin, Transportation Group Manager, Director

1. Introduction

Abley Limited (Abley) has been commissioned by Waka Kotahi NZ Transport Agency (Waka Kotahi) to undertake programme level benefit cost analysis for the Road to Zero Programme Business Case (PBC). As part of this analysis, a methodology for calculating programme level BCRs has been developed based on an approach that considers Travel Time and Vehicle Operating Cost changes in the context of:

- A corridor Safe and Appropriate Speed: Do Minimum, and
- An Intersection Safe System Speed: Do Minimum.

Details of how the Road to Zero Strategic Programme was prepared are covered by a separate Technical Note.

Note that the economics developed in this Technical Note utilise the Waka Kotahi Economic Evaluation Manual (first edition, amendment 2) and predate the introduction of the Monetised Benefits and Costs Manual.

2. Methodology

This methodology developed to calculate programme level benefit to cost ratios (BCRs) comprises three key components. These elements are:

- Death and Serious Injury (DSI) reduction,
- Travel Time (TT) changes, and
- Vehicle Operating Cost (VOC) changes.

2.1 Safe and Appropriate Speed: Do Minimum

As set out in Section 2.7 of Waka Kotahi Economic Evaluation Manual (EEM), “*where a Road Controlling Authority decides to introduce one or more interventions to address unacceptable levels of collective and/or personal risk, to re-set the speed limit, and/or to manage speeds on a particular piece of road, the do minimum can include benefits and costs of implementing a new safe and appropriate operating speed*”.

The EEM also states that “*in such situations the do minimum should be compared to both the do nothing and the other activity options in order to determine whether the do minimum is the preferred option (i.e., the optimal solution) or whether additional improvements are justified over and above the do minimum and if these additional improvements are therefore the preferred option*”.

Waka Kotahi has taken a view that safe and appropriate speeds (SAASs) should be implemented throughout the network. As such, the economic analysis undertaken to inform the PBC has started from this scenario (the ‘do minimum’) rather than the current situation.

For the purposes of this analysis, BCRs for implementing a new safe and appropriate operating speed are calculated by comparing the ‘do nothing’ option to a ‘do minimum’ (i.e. implementing a new safe and appropriate operating speed). For this option, both vehicle operating cost and travel time changes are ignored as instructed by Waka Kotahi.

BCRs for implementing physical upgrades to the road to make it safer (for example, a median barrier) are calculated by comparing the ‘do minimum’ (i.e. implementing a new safe and appropriate operating speed) to a ‘do something’ (i.e. the physical upgrades proposed). For this option, both vehicle operating cost and travel time changes are included for physical upgrades where the road can support a higher SAAS after the upgrade, as instructed by Waka Kotahi.

2.2 Intersection Safe System Speed: Do Minimum

Waka Kotahi has requested an evaluation of programme level BCRs using the Safe System speed¹ as the ‘do minimum’ scenario when assessing road safety improvements at intersections. The Safe System speed for rural intersections (where vulnerable road users such as pedestrians and cyclists are not generally present) is 50km/h. The Safe System speed for urban intersections (where vulnerable road users such as pedestrians and cyclists are generally present) is 30km/h.

BCRs for implementing physical upgrades to make the intersection safer (for example, a roundabout) are calculated by comparing the ‘do minimum’ (i.e. implementing changes which would enforce safe speeds through the intersection) to a ‘do something’ (i.e. the physical upgrades proposed). For this option, both vehicle operating cost and travel time changes are included for physical upgrades as instructed by Waka Kotahi.

2.3 Estimated DSI Changes

For rural corridors (current posted speed limit ≥ 80 km/h), a cost per DSI of \$1,400,000 is utilised. For urban corridors (posted speed limit ≤ 70 km/h), a cost per DSI of \$1,100,000 is utilised. These values are based on analysis which considers the ratio of fatal to serious injuries and the Ministry of Transport’s latest estimates² for the social cost of road crashes and injuries. **Table 2.1** shows these calculations.

¹ <http://www.towardszerofoundation.org/thesafesystem/>

² <https://www.transport.govt.nz/assets/Uploads/Report/SocialCostof-RoadCrashesandInjuries2019.pdf>

Table 2.1 Social cost savings per DSI

	Fatalities (2015-19)	Severe Injuries (2015-19)	Serious Injuries per DSI Injury	Fatal Injuries per DSI Injury	MOT cost per reported Serious/Fatal injury as at June 2019	Weighted Cost per DSI	Assumed Cost per DSI
Rural	1,300	6,566	0.83	0.17	\$850,000 / serious injury \$4,562,000 / fatality	\$1,463,000	\$1,400,000
Urban	452	6,117	0.93	0.07		\$1,105,000	\$1,100,000

The assumed DSI reduction and implementation costs associated with each road safety intervention included in the Road to Zero Strategic Programme is shown in **Table 2.2**.

Table 2.2 Assumed DSI Reduction and Implementation Costs by Road Safety Intervention

Feature	Intervention	Benefit Calculation	Cost
Corridors	Top 10% GPS Speed Management ³	Nilsson's Power Model (see Appendix B)	\$20,000 per km with a minimum value of \$100,000 per corridor
	Safe System Transformation	65% DSi reduction	\$2.6m per km including maintenance costs
	Supporting Safe System Treatment (medium cost)	30% DSi reduction	\$1.25m per km including maintenance costs
	Supporting Safe System Treatment (low cost)	15% DSi reduction	\$0.4m per km including maintenance costs
Intersections	Rural Safe System Transformation	70% DSi reduction	\$3.3m per site including maintenance costs
	Rural Supporting Safe System Treatment (medium cost)	40% DSi reduction	\$0.5m per site including maintenance costs
	Rural Supporting Safe System Treatment (low cost)	35% DSi reduction	\$0.33m per site including maintenance costs
	Urban Safe System Transformation	60% DSi reduction	\$1.65m per site including maintenance costs
	Urban Safe System Transformation (low cost)	60% DSi reduction	\$0.25m per site including maintenance costs

³ The Top 10% Government Policy Statement (GPS) Speed Management corridors are the highest priority sections on New Zealand's road network for speed management. These corridors collectively make up 10% of New Zealand's roads by length.

Feature	Intervention	Benefit Calculation	Cost
	Urban Supporting Safe System Treatment (medium cost 1)	40% DSI reduction	\$0.5m per site including maintenance costs
	Urban Supporting Safe System Treatment (medium cost 2)	For platforms: -40% DSI reduction For right-turn filter removal: -35% reduction in injury crashes ⁴	For platforms: -\$0.44m per site including maintenance costs For right-turn filter removal: -\$0.20m per site. No additional maintenance costs assumed.

Speed scaling factors are applied to intersection interventions situated on corridors in the Top 10% GPS such that DSI reduction benefits are based on the residual DSI remaining after speed management measures are in place. The DSI speed scaling factors for various before and after speed limit combinations are shown below.

Table 2.3 Speed scaling factors

Speed Limit Before (km/h)	Speed Limit After (km/h)	DSI Speed Scaling Factor
100	80	0.71
100	60	0.59
80	60	0.83
80	≤50	0.72
70	60	0.88
70	≤50	0.77
60	≤50	0.87

2.4 TT and VOC Changes

The cost of time used in analysis is:

- \$22.72 per hour for rural areas (80km/h or greater), and
- \$16.27 per hour for urban areas (less than 80km/h)⁵.

An update factor of 1.54 is applied to these costs to adjust these costs to current day values⁶.

⁴This DSI reduction estimate based on severity index of right turn against (Type L) crashes for intersection type.

⁵ NZTA EEM Table A4.3 Composite values of travel time in \$/h (all occupants and vehicle types combined - July 2002)

⁶ <https://www.nzta.govt.nz/assets/resources/economic-evaluation-manual/economic-evaluation-manual/docs/eem-update-factors.pdf>

The TT and VOC change assumptions used in the evaluation of corridor improvements identified as part of the Road to Zero Strategic Programme are shown in **Table 2.4**.

Table 2.4 TT and VOC Changes for Road Safety Interventions for corridors (assumed change from the Do Minimum scenario)

Intervention	Assumed TT change per vehicle*	Assumed VOC per vehicle
Top 10% GPS Speed Management	No Change (see Section 2.1)	No Change (see Section 2.1)
Safe System Transformation	(Predicted Operating Speed – Operating Speed at SAAS) x Corridor Length x Cost per hour of travel	VOC speed change cost from EEM Table A5.1 x Corridor Length
Supporting Safe System Treatment (medium cost)	No Change (see Section 2.1)	No Change (see Section 2.1)
Supporting Safe System Treatment (low cost)		

The TT and VOC change assumptions used in the evaluation of intersections improvements identified as part of the Road to Zero Strategic Programme are shown in **Table 2.5**. Further detail regarding how these values have been formulated is provided in Appendix A.

Table 2.5 TT and VOC changes for Road Safety Interventions at Intersections (Assumed change from the Do Minimum scenario)

Treatment Type	Assumed TT change per vehicle on major approaches	Assumed TT change per vehicle on minor approaches	Assumed VOC per vehicle on major approaches	Assumed VOC per vehicle on minor approaches
Rural Safe System Transformation (Rural Roundabout)	+2s	No Change	+0.4c	No Change
Rural Supporting Safe System Treatment (medium cost) (Rural Roundabout Upgrade)	No Change	No Change	No Change	No Change
Rural Supporting Safe System Treatment (low cost) (Intersection Speed Zone)	-1s	No Change	-0.3c	No Change

Treatment Type	Assumed TT change per vehicle on major approaches	Assumed TT change per vehicle on minor approaches	Assumed VOC per vehicle on major approaches	Assumed VOC per vehicle on minor approaches
Urban Safe System Transformation (Urban Roundabout)	+1s	No Change	+0.1c	No Change
Urban Supporting Safe System Treatment (medium cost) (Platform, Urban Roundabout Upgrade and/or Filter Removal)	No Change	No Change	No Change	No Change
Urban Supporting Safe System Treatment (low cost) (Left in/out)	No Change	+5s	No Change	No Change

2.5 BCR Analysis

Because most road safety interventions at intersections often introduce a small amount of addition travel delay, a sensitivity BCR has been produced for intersections to demonstrate the sensitivity of the economic appraisal to small changes in travel time. This BCR can be adopted should small changes in travel time at intersections be ignored for the purposes of assessing road safety improvements.

Note that a Uniform Series Present Worth factor of 15.49 has been used for the purposes of benefit cost analysis. This value assumes a 40-year return period and 6% discount rate in line with guidance in Section 2.6 of the Waka Kotahi EEM. For simplicity, all costs have been accumulated at time zero, and all benefits have been accumulated over the analysis period starting at time zero.

Indicative Safety Only BCR (Intersections Only)

$$\text{Indicative Safety Only BCR} = \frac{15.49 * \text{Social cost savings per DSI saved} * \text{DSI savings per annum}}{\text{Estimated cost of project}}$$

Indicative Overall BCR

$$\text{Indicative Overall BCR} = \frac{15.49 * (\text{DSI, TT and VOC change costs per annum})}{\text{Estimated cost of project}}$$

Appendix A: TT and VOC Changes – Intersections

The scenarios in this appendix set out to estimate the travel time and vehicle operating cost changes for each intersection treatment strategy described in this Technical Note. It is acknowledged that treatments will vary at an individual level in terms of the exact type of treatment (and therefore travel time and vehicle operating cost change). The scenarios are intended to capture a typical scenario for the type of treatment which may applied under a given treatment strategy. This is considered appropriate for programme level calculations.

Treatment Strategy	Scenario Explanation	Travel Time Change Explanation	Vehicle Operating Cost Change Explanation
<p>Rural Safe System Transformation (high cost)</p>	<p>Typically, in New Zealand, rural intersections are priority controlled i.e. two-legs of the intersection have uninterrupted priority and one or more legs of the intersection have to Stop or Give Way to traffic with priority. Rural roundabouts are commonly used as a high-cost, best practice safe system option to address safety issues.</p> <p>A 'do minimum' option could be to establish an intersection speed zone (through posted speed limits and enforcement) which slows vehicles to 50km/h at the intersection.</p>	<p>Do Minimum Scenario</p> <p>On minor approaches, no change in travel time is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, the safe system speed for vehicles traversing an intersection is 50km/h. It is therefore assumed that the 'do minimum' scenario involves an intersection speed zone being established (through posted speed limits) whereby vehicles slow from an operating speed of 90km/h to 50km/h over an assumed length of 200m. It is then assumed that vehicles accelerate back to 90km/h over a 200m distance. The extra delay incurred in this scenario is 20s.</p> <p>Do Option Scenario</p> <p>On minor approaches, no change in travel time is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before). Note that this is a highly conservative assumption as some vehicles will not be required to stop and give way.</p> <p>On major approaches, it is assumed that all vehicles slow from an operating speed of 90km/h to 40km/h over an assumed length of 200m^[7]. It is then assumed that vehicles accelerate back to 90km/h over a 200m distance. 40km/h is an average value, acknowledging that vehicles speed up/slow down over this distance, some vehicles will travel faster than 40km/h if they don't have to give way, and some vehicles may have to stop completely and give way/wait for a gap. The extra delay incurred in this scenario is 22s.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>The time difference between the two scenarios considered is approximately 2s more delay per vehicle on major approaches only.</p>	<p>Do Minimum Scenario</p> <p>On minor approaches, no change in VOCs is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, the safe system speed for vehicles traversing an intersection is 50km/h. It is therefore assumed that the 'do minimum' scenario involves an intersection speed zone being established (through posted speed limits) whereby vehicles slow from an operating speed of 90km/h to 50km/h over an assumed length of 200m. It is then assumed that vehicles accelerate back to 90km/h over a 200m distance. The extra VOC incurred in this scenario is 1.1c per vehicle on major approaches.</p> <p>Do Option Scenario</p> <p>On minor approaches, no change in VOCs is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before). Note that this is a highly conservative assumption as some vehicles will not be required to stop and give way.</p> <p>On major approaches, it is assumed that all vehicles slow from an operating speed of 90km/h to 40km/h over an assumed length of 200m. It is then assumed that vehicles accelerate back to 90km/h over a 200m distance. 40km/h is an average value, acknowledging that vehicles speed up/slow down over this distance, some vehicles may travel faster than 40km/h if they don't have to give way, and some vehicles may have to stop completely and give way/wait for a gap. The extra VOC incurred in this scenario is 1.5c per vehicle.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>The difference between the two scenarios considered is approximately 0.4c extra VOC per vehicle.</p>

Treatment Strategy	Scenario Explanation	Travel Time Change Explanation	Vehicle Operating Cost Change Explanation
Rural Supporting Safe System Treatment (low cost)	Typically, in New Zealand, rural intersections are priority controlled. Intersection speed zones are commonly used as a low-cost option to bring these intersections closer to safe system operation.	<p>Do Minimum Scenario</p> <p>On minor approaches, no change in travel time is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, the safe system speed for vehicles traversing an intersection is 50km/h. It is therefore assumed that the 'do minimum' scenario involves an intersection speed zone being established (through posted speed limits) whereby vehicles slow from an operating speed of 90km/h to 50km/h over an assumed length of 200m. It is then assumed that vehicles accelerate back to 90km/h over a 200m distance. The extra delay incurred in this scenario is 10s.</p> <p>Do Option Scenario</p> <p>On minor approaches, no change in travel time is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, assume that vehicles slow from an operating speed of 90km/h to 60km/h (60km/h is Waka Kotahi's standard speed for a rural intersection speed zone). This is a highly conservative assumption as the level of traffic on the side road governs the amount of time the Intersection speed zone is operational. The extra delay incurred in this scenario is 9s.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>The time difference between the two scenarios considered is approximately 1s less delay per vehicle on major approaches only.</p>	<p>Do Minimum Scenario</p> <p>No change of vehicle behaviour is assumed on minor approaches (i.e. they still stop and give way) so no change in VOC is assumed.</p> <p>The safe system speed for vehicles traversing an intersection is 50km/h. It is therefore assumed that the 'do minimum' scenario involves a vehicle slowing from an operating speed of 90km/h to 50km/h over an assumed length of 200m. It is then assumed that vehicles accelerate back to 90km/h over a 200m distance. The extra delay incurred in this scenario is 1.1c per vehicle.</p> <p>Do Option Scenario</p> <p>No change of vehicle behaviour is assumed on minor approaches (i.e. they still stop and give way) so no change in VOC is assumed.</p> <p>On major approaches, assume that vehicles slow from an operating speed of 90km/h to 60km/h over an assumed length of 200m. It is then assumed that vehicles accelerate back to 90km/h over a 200m distance. The extra delay incurred in this scenario is 0.8c per vehicle.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>The difference between the two scenarios considered is approximately 0.3c extra VOC per vehicle on major approaches only.</p>

^[7] Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

Treatment Strategy	Scenario Explanation	Travel Time Change Explanation	Vehicle Operating Cost Change Explanation
<p>Urban Safe System Transformation (high cost)</p>	<p>Typically, in New Zealand, urban intersections are priority controlled or signalised. Urban roundabouts are commonly used as a best practice safe system option to address safety issues.</p> <p>A 'do minimum' option could be to establish an intersection speed zone (through posted speed limits and enforcement) which slows vehicles to 30km/h at the intersection.</p>	<p>Do Minimum Scenario</p> <p>On minor approaches, no change in travel time is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, the safe system speed for vehicles traversing an urban intersection is 30km/h. It is therefore assumed that the 'do minimum' scenario involves an intersection speed zone being established (through posted speed limits) whereby vehicles slow from an operating speed of 50km/h to 30km/h over an assumed length of 50m. It is then assumed that vehicles accelerate back to 50km/h over a 50m distance. The extra delay incurred in this scenario is 9s.</p> <p>Do Option Scenario</p> <p>On minor approaches, no change in travel time is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, it is assumed that all vehicles slow from an operating speed of 50km/h to 25km/h over an assumed length of 50m^[8]. It is then assumed that vehicles accelerate back to 50km/h over a 50m distance. 25km/h is an average value, acknowledging that vehicles speed up/slow down over this distance, some vehicles will travel faster than 25km/h if they don't have to give way, and some vehicles may have to stop completely and give way/wait for a gap. The extra delay incurred in this scenario is approximately 10s. Note that this is a highly conservative assumption as some vehicles will not be required to stop and give way.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>The time difference between the two scenarios considered is approximately 1s more delay per vehicle on major approaches only.</p>	<p>Do Minimum Scenario</p> <p>On minor approaches, no change in VOCs is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, the safe system speed for vehicles traversing an urban intersection is 30km/h. It is therefore assumed that the 'do minimum' scenario involves an intersection speed zone being established (through posted speed limits) whereby vehicles slow from an operating speed of 50km/h to 30km/h over an assumed length of 50m. It is then assumed that vehicles accelerate back to 50km/h over a 50m distance. The extra VOC incurred in this scenario is 0.4c per vehicle.</p> <p>Do Option Scenario</p> <p>On minor approaches, no change in VOCs is assumed (i.e. it is assumed that all vehicles will have to stop and give way at the same rate as before).</p> <p>On major approaches, it is assumed that all vehicles slow from an operating speed of 50km/h to 25km/h over an assumed length of 50m. It is then assumed that vehicles accelerate back to 50km/h over a 50m distance. 25km/h is an average value, acknowledging that vehicles speed up/slow down over this distance, some vehicles may travel faster than 25km/h if they don't have to give way, and some vehicles may have to stop completely and give way/wait for a gap. The extra VOC incurred in this scenario is 0.5c per vehicle. Note that this is a highly conservative assumption as some vehicles will not be required to stop and give way.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>The difference between the two scenarios considered is approximately 0.1c extra VOC per vehicle on major approaches only.</p>

Treatment Strategy	Scenario Explanation	Travel Time Change Explanation	Vehicle Operating Cost Change Explanation
<p>Urban Supporting Safe System Treatment (medium cost)</p>	<p>Typically, in New Zealand, urban intersections which are already controlled by a roundabout or signals are not designed to reinforce safe speed limits (see Urban Supporting Safe System Treatment (low cost) for priority-controlled intersections). Treatments which can be used to reduce operating speeds to safe system speeds through an intersection include raised platforms, enlarged central roundabout islands and kerb buildouts.</p> <p>A 'do minimum' option could be to establish an intersection speed zone (through posted speed limits and enforcement) which slows vehicles to 30km/h at the intersection.</p>	<p>Do Minimum Scenario</p> <p>The safe system speed for vehicles traversing an intersection is 50km/h in rural areas and 30km/h in urban areas. It is therefore assumed that the 'do minimum' scenario involves vehicles slowing to 30km/h at an urban intersection or 50km/h at a rural intersection.</p> <p>Do Option Scenario</p> <p>Assume that whichever design/operational elements are used to improve safety at an intersection involve vehicles slowing to 30km/h at an urban intersection or 50km/h at a rural intersection.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>As the 'do minimum' scenario and treatment involve the same speed reductions, no travel time changes are assumed.</p>	<p>Do Minimum Scenario</p> <p>The safe system speed for vehicles traversing an intersection is 50km/h in rural areas and 30km/h in urban areas. It is therefore assumed that the 'do minimum' scenario involves vehicles slowing to 30km/h at an urban intersection or 50km/h at a rural intersection.</p> <p>Do Option Scenario</p> <p>Assume that whichever design/operational elements are used to improve safety at an intersection involve vehicles slowing to 30km/h at an urban intersection or 50km/h at a rural intersection.</p> <p>Comparison between Do Option and Do Minimum Options</p> <p>As the 'do minimum' scenario and treatment involve the same speed reductions, no VOC changes are assumed.</p>

^[8] Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

Treatment Strategy	Scenario Explanation	Travel Time Change Explanation	Vehicle Operating Cost Change Explanation
<p>Urban Supporting Safe System Treatment (low cost)</p>	<p>Typically, in New Zealand, urban intersections which are priority controlled are not designed to reinforce safe speed limits. A common treatment used to bring these intersections closer to safe system operation involve turning restrictions.</p> <p>The Do Minimum and Do Option Scenario are considered to be the same in this scenario, therefore a Do Nothing option and Do Minimum are compared.</p>	<p>Do Minimum Scenario</p> <p>Assume that turning restrictions are introduced such that only left turns in/out of the side road are retained.</p> <p>On major approaches, no change in travel time is assumed (i.e. a negligible delay is assumed for vehicles which need to re-route to avoid turning right at the intersection).</p> <p>On minor approaches, a small increase in travel time of 10s per vehicle is assumed to account for vehicles which need to re-route to avoid travelling straight through or turning right from the intersection. Half of traffic is assumed to travel straight through or turn right from the intersection so therefore the average assumed increase in travel time is 5s.</p> <p>Comparison between Do Nothing and Do Minimum Options</p> <p>The time difference between the two scenarios considered is approximately 5s more delay per vehicle on minor approaches only.</p>	<p>Do Minimum Scenario</p> <p>Assume that turning restrictions are introduced such that only left turns in/out of the side road are retained.</p> <p>On both major and minor approaches, no change in VOC is assumed (i.e. a negligible increase in VOC is assumed for vehicles which need to re-route to avoid turning movements at the intersection).</p> <p>Comparison between Do Nothing and Do Minimum Options</p> <p>The VOC changes between the two scenarios are considered negligible.</p>

Appendix B: Modified Nilsson's Power Model

A modified version of Nilsson's Power Model has been derived to estimate changes in DSIs rather than crashes. Note that reference to operating speeds in this section refer to mean operating speed unless otherwise stated.

Power Model Modification

Studies undertaken by Elvik (2009) and Cameron et al. (2010) confirm that speed environment is an important moderator of Nilsson's Power Model. Elvik concluded that in general, changes in speed have a smaller effect at low speeds than at high speeds. Furthermore, the analyses show that the exponents proposed by Nilsson based on speed limit changes in Sweden during 1967-1972 overestimate the expected DSI reductions due to various safety improvements in the last 40 years. However, both authors acknowledge that the Power Model remains a valid model of the relationship between speed and road safety if the exponents are adjusted according to speed environment.

Elvik's study presents separate exponents that are considered the best estimate for calculating DSI reductions in rural and urban speed environments. To utilise these exponents accurately, it is proposed that the original Power Model is modified as below:

Original form: $Crashes\ after/Crashes\ before = (Speed\ after/Speed\ before)^{Exponent}$

Modified form: $Estimated\ DSI\ after/Estimated\ DSI\ before = (Speed\ after/Speed\ before)^{Exponent}$

The following commentary from Nilsson (2004) confirms that the modified form of the model is valid:

When information is only available concerning injured persons and not accidents, the same estimate as for accidents can be used but based on the number of injured. When the number of injured (z_0) is changed into (z_1) because of a change in speed from v_0 to v_1 and $z_1' = z_0 \left(\frac{v_1}{v_0}\right)^2$ instead of $z_1 = y_0 \left(\frac{v_1}{v_0}\right)^2 + (z_0 - y_0) \left(\frac{v_1}{v_0}\right)^4$ (5.17)

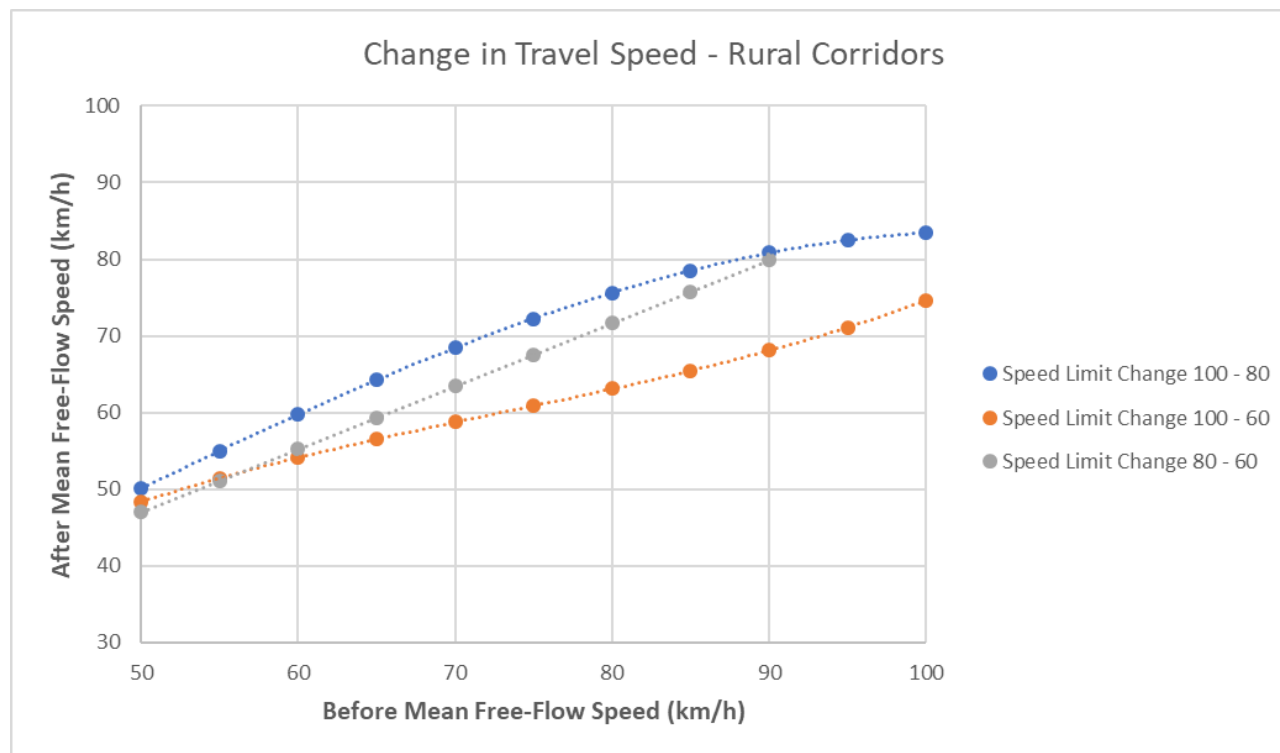
The concern with using the modified form of the model is that the safety effect will be underestimated as the number of injuries per crash is not considered. However, as an input to the Speed Management Plan development process, the corridor DSI is estimated by applying severity indices to all injury crashes reported along a corridor, rather than using actual injury numbers. Therefore, the modified model will not underestimate nor, and more importantly, overestimate the DSI reductions because of a speed change.

Rural DSI Reduction

As per Elvik's recommendation, the following Power Model equation is proposed for calculating future DSI on rural corridors (posted speed limit ≥ 80 km/h):

$$\text{Estimated Future DSi} = \text{Estimated DSi} \times (\text{Speed after}/\text{Speed before})^{3.5}$$

'Speed Before' values are derived from TomTom operating speed data while 'Speed After' values are based on modelled relationships between existing travel speeds and future travel speeds on the Waikato and Top of the South (Marlborough, Nelson and Tasman districts) networks using the Austroads Operating Speed Model. 'Speed After' values been moderated to ensure that potential DSi savings are not overestimated. This has been achieved by limiting the difference between current operating speed and future operating speed to a maximum rate of change of 5km/h for every 10km/h change in speed limit. The adopted relationships applied are below.



In practice the use of Nilsson's Power Model has been found to translate to an average DSi reduction of 27% for 100km/h road subject to a proposed 80km/h speed limit.

Urban DSI Reduction

As per Elvik's recommendation, the following Power Model equation is proposed for calculating future DSI on urban corridors (posted speed limit < 80 km/h):

$$\text{Estimated Future DSI} = \text{Estimated DSI} \times (\text{Speed after}/\text{Speed before})^2$$

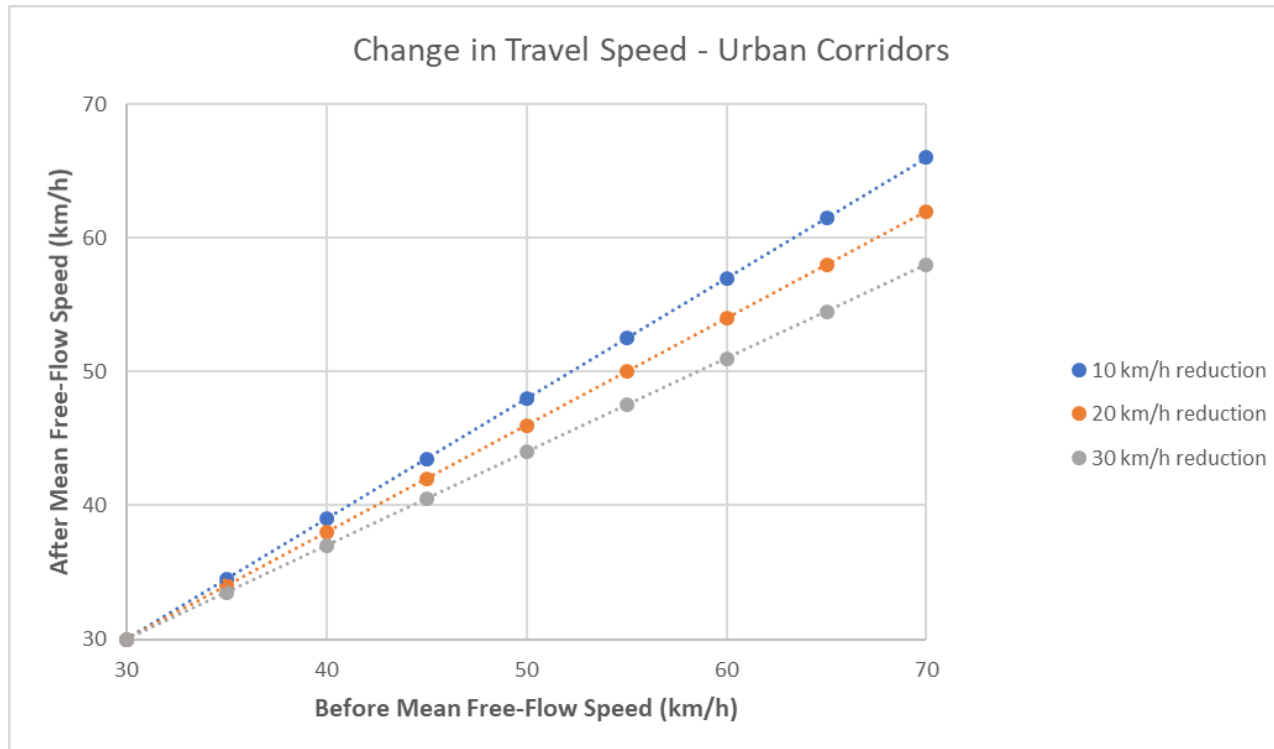
- As the Austroads Operating Speed Model is only applicable to rural roads, operating speeds for urban corridors need to be estimated. Based on the analysis of some speed data in Hamilton, the following coarse assumptions were used in the estimation of existing operating speeds: All corridors with 'Winding' or 'Tortuous' alignment, Operating Speed = Speed Limit
- If ONRC is Class 3 or 4, Operating Speed = Speed Limit + 5 km/h
- Otherwise, Operating Speed = Speed Limit + 10 km/h

The relationship between the change in speed limit and change in travel speed was developed collaboratively with the NZ Transport Agency and agreed to be a linear relationship.

The linear relationship for the change in operating speeds as a result of a 10 km/h speed limit reduction is given by:

$$\text{Operating Speed After} = 0.9 \times \text{Operating Speed Before} + 3$$

Application of the above equation for three speed limit reduction scenarios is shown below.



In practice the use of Nilsson’s Power Model has been found to translate to an average DSi reduction of 9% for 50km/h road subject to a proposed 40km/h speed limit

References

Elvik, R. (2009). “The Power Model of the relationship between speed and road safety. Update and new analyses.” Report 1034/2009, Institute of Transport Economics, Oslo, Norway. <http://www.toi.no/getfile.php?mmfileid=13206>

Cameron MH, Elvik R (2010). “Nilsson’s Power Model connecting speed and road trauma: Applicability by road type and alternative models for urban roads”, Accident Analysis & Prevention 42: 1908–1915 <http://www.sciencedirect.com/science/article/pii/S000145751000148X>

Appendix D - Intervention Indicators

Appendix D – Focus Area KPIs

Vehicle Safety

The tables below show the intervention, performance, and outcome indicators for Vehicle Safety.

Table 1 Vehicle Safety Programme Delivery Intervention Indicators

KPI	Indicator Description	Owner
2.1.1	Progress around the delivery of a package of new safety standards for vehicles entering the fleet	MOT
2.1.2	Increased understanding of vehicle safety	
2.1.3	Increased % of safer 4- and 5-star safety rated vehicles in the light vehicle fleet	
2.1.4	Policy implemented to mandate ABS for new motorcycles over 125 cc by April 2020	
2.1.5	% of road safety advertising campaigns that meet or exceed their agreed success criteria	Waka Kotahi

Table 2 Vehicle Safety System Performance Indicators

KPI	Indicator Description	Owner
2.2.1	% of the vehicle fleet with a high safety rating	MOT
2.2.2	% of the public understand vehicle safety information	Waka Kotahi
2.2.3	% of the public agree that it is important to have a vehicle that has a high safety rating	
2.2.4	% of motorcycles over 125 cc fitted with ABS	

Table 3 Vehicle Safety Outcome Indicators

KPI	Indicator Description	Owner
2.3.1	Number of DSI crashes involving a vehicle with a low safety rating	Waka Kotahi
2.3.2	Number of motorcyclist DSIs	
2.3.3	Number of ACC entitlement claims related to motorcycling injuries	ACC

Work Related Road Safety

The tables below show the intervention, performance, and outcome indicators for Work Related Road Safety.

Table 4 Work Related Road Safety Programme Delivery Intervention Indicators

KPI	Indicator Description	Owner
3.1.1	Progress around private sector initiatives to establish best practice road safety standards in the supply chain	Waka Kotahi/ Worksafe
3.1.2	Progress around the review of logbook and work time requirements as part of the 2019/20 rules programme	
3.1.3	Incorporate journey purpose into the Crash Analysis System (CAS)	

Table 5 Work Related Road Safety System Performance Indicators

KPI	Indicator Description	Owner
3.2.1	Number of organisations with health and safety plans in place that recognise road safety as a critical health and safety issue	Waka Kotahi/ Worksafe
3.2.2	Number of organisations implementing the shift working driver fatigue programme that report improved employee behaviour to prevent fatigued driving	
3.2.3	Number of organisations implementing the shift working driver fatigue programme that report employers taking action to prevent fatigue driving	
3.2.4	% of sector satisfied with their access to relevant data on road safety work-related travel	

Table 6 Work Related Road Safety Outcome Indicators

KPI	Indicator Description	Owner
3.3.1	Number of DSI crashes involving a person travelling to/from work	Waka Kotahi/ Worksafe
3.3.2	Number of DSI involving a person travelling as part of work	
3.3.3	Number of DSIs involving a heavy vehicle	
3.3.4	Number of DSIs crashes at roadworks sites	
3.3.5	Number of DSIs crashes with fatigue being a contributing factor	
3.3.6	% of work-related fatalities and serious injuries involving motor vehicles	

Road User Choices

The tables below show the intervention, performance, and outcome indicators for Road User Choices.

Table 7 Road User Choices Programme Delivery Intervention Indicators

KPI	Indicator Description	Owner
4.1.1	# Sworn staff dedicated to road policing	NZ Police
4.1.2	# Breath tests conducted (increase to 2 million in 2019/20 and 3 million in 20/21)	
4.1.3	# Police operations targeting restraints, impairment, and distraction offences	
4.1.4	# Offender Management Plans in place for high risk drivers (1700+ per year)	
4.1.5	% of road safety advertising campaigns that meet or exceed their agreed success criteria	Waka Kotahi
4.1.6	Progress alignment of key road safety penalty and remedies to the appropriate framework	MOT
4.1.7	# and % of active licensed motorcyclists that have taken an approved training course	Waka Kotahi
4.1.8	# adults and students attending cycle skills training courses	
4.1.9	% Officer-issued notices which are rural	NZ Police
4.1.10	# organisations implementing the shift working driver fatigue programme that report improved employee behaviour to prevent fatigued driving	Waka Kotahi/ Worksafe
4.1.11	# organisations implementing the shift working driver fatigue programme that report employers taking action to prevent fatigue driving	

Table 8 Road User Choices System Performance Indicators

KPI	Indicator Description	Owner
4.2.1	% of drivers impaired by alcohol	NZ Police
4.2.2	% of drivers impaired by drugs	
4.2.3	% of drivers using handheld cell phones while driving	
4.2.4	% of car occupants using a seatbelt or child restraint	
4.2.5	% of the public agree that it is likely to get caught for undertaking risky behaviours	Waka Kotahi
4.2.6	Number of ACC claims trained motorcycle riders make compared to untrained riders	ACC

Table 9 Road User Choices Outcome Indicators

KPI	Indicator Description	Owner
4.3.1	Number of DSIs involving alcohol and/or drugs	Waka Kotahi
4.3.2	Number of DSIs with fatigue being a contributing factor	
4.3.3	Number of DSIs with distraction being a contributing factor	
4.3.4	Number of vehicle occupants' deaths where restraints were not worn	
4.3.5	Number of motorcyclist DSIs	

System Management

The tables below show the intervention, performance, and outcome indicators for System Management.

Table 10 System Management Programme Delivery Intervention Indicators

KPI	Indicator Description	Owner
5.1.1	% of the public that were exposed to messages on Vision Zero	Waka Kotahi
5.1.2	% of the public that were exposed to messages on effectiveness of road safety interventions	
5.1.3	# of people in sector who have completed safe system training	
5.1.4	Progress towards better understanding of what the contributing factors are in relation to Maori road safety outcomes and an increased awareness of Maori road safety aspirations	

Table 11 System Management System Performance Indicators

KPI	Indicator Description	Owner
5.3.1	% of the public understand and support the Vision Zero approach	Waka Kotahi
5.3.2	% of the public show acceptance of road safety interventions	

Table 12 System Management Outcome Indicators

KPI	Indicator Description	Owner
5.3.1	% of sector satisfied with their access to information relevant to road safety decision making	Waka Kotahi
5.3.2	% of local government satisfied with support they received from central government transport agencies	

Appendix E – Procurement Strategy



SNP: FRAMEWORK PROCUREMENT STRATEGY

MAY 2020

FINAL

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1. ABOUT THIS PROCUREMENT STRATEGY

1.1 Purpose and Intent

The Safe Network Programme is a key component of the National Land Transport Programme (NLTP), with the target of reducing deaths and serious injuries across New Zealand's highest risk state highways and local roads.

With a multi-year investment profile, and a large number of individual projects and interventions, the Safe Networks Programme is complex and has a near-total dependency on external suppliers.

This strategy sets out the framework approach to how Waka Kotahi NZ Transport Agency will manage the range of procurement activities needed to support the Safe Networks Programme (SNP).

The purpose of this strategy's is to guide SNP's procurement planning and decision making, and to set out a framework within which the programme's procurement can be managed and measured. The strategy is intended to be permissive, and to encourage innovation in pursuit of Programme objectives.

This strategy has been endorsed by the Senior Manager Procurement and the SNP Steering Team and has been approved by the General Manager Transport Services.

All Transport Agency employees, contractors, consultants, and agents are expected to apply the guidance within this Strategy when planning or undertaking any procurement activity in support of the SNP.

1.2 Scope

This strategy addresses the planning, sourcing and management of external resources required to deliver on the Safe Network Programme (SNP) under the NLTP.

We have identified two direct categories of supply necessary to deliver on the SNP:

- Advisory and Professional Services
- Material supply and Physical Works

Services associated with the maintenance and operation of constructed or improved assets are out of scope for this procurement strategy, noting that State Highway network maintenance is performed through existing Alliance or Network Outcome contracts, and local road maintenance is performed through existing term-service contracts managed by the relevant Council. Any new assets created through the SNP will be included within the scope of the relevant maintenance and operations contract.

This strategy applies to the components of the SNP directly managed and delivered by the Transport Agency and does not limit or require specific actions from Approved Organisations (Councils) when utilising National Land Transport Funds. However, this strategy does encourage collaboration between Transport Agency and Councils in planning and delivering safety interventions under the SNP.

1.3 Review

This strategy will be reviewed at least annually, but more frequently as required – including in response to any substantive changes in programme scope or direction, or changes to Transport Agency procurement methodologies.

Minor amendments can be made on the approval of the Senior Manager Procurement with notification to SNP Steering Team or equivalent governance authority.

Substantive changes must be approved by the General Manager Transport Services on the recommendation of the Senior Manager Procurement and endorsement by the SNP Steering Team.

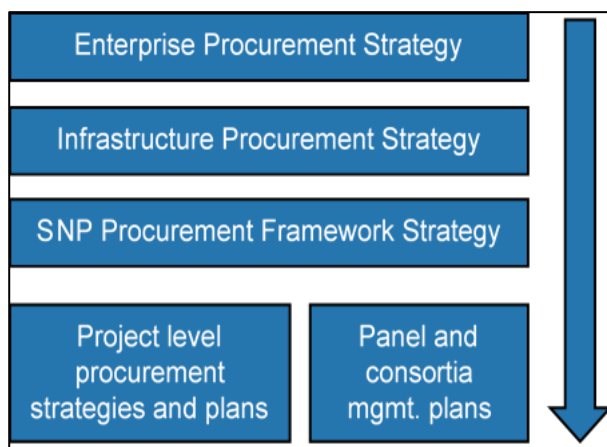
1.4 Alignment with other Documents

Development of this strategy has been directly informed by the Transport Agency’s Infrastructure Procurement Strategy, which was endorsed by the NZ Transport Agency Board in 2019.

Contextual background and content relating more broadly to our infrastructure procurement, (such as an assessment of market conditions and consideration of external drivers such as the Construction Sector Accord) are not replicated within this document and are maintained within the Infrastructure Procurement Strategy.

This strategy is intended to be complementary to the Safe Networks Programme Management Plan, and other programme specific documentation.

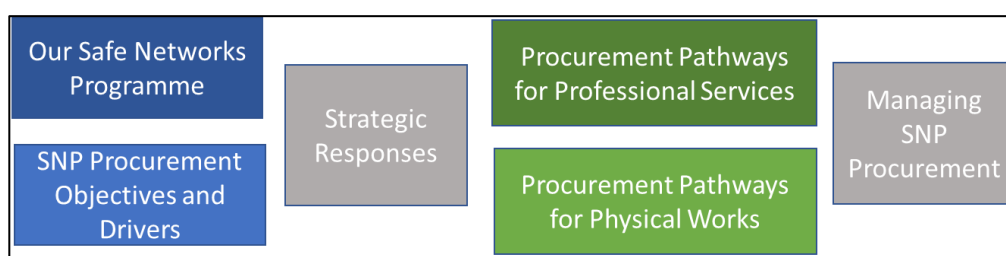
This strategy framework is intended to directly inform all project level procurement strategies and plans.



1.5 Reading Map

This framework strategy is structured in seven main sections.

- We begin by describing **Our Safe Networks Programme** and identifying the key procurement characteristics of the programme.
- We then present the **Procurement Objectives and Drivers** for SNP, describing what procurement activity seeks to achieve, key procurement risks, and what will be valued when making procurement decisions in the programme
- These sections inform our **Strategic Responses**. This is the heart of this framework strategy, and sets out the specific, practical procurement strategies that SNP will apply.
- We then provide an overview of the Advisory and Professional Service requirements of the programme, and set out the primary **procurement pathways for Professional Services** that will be used to contract for these services
- We provide commentary and guidance about procurement planning and **procurement pathways for Physical Works**, the approach to setting Non-Price-Attributes for evaluation and identify additional potential strategic initiatives that should be considered as the Programme progresses.
- Finally, this strategy identifies key management activities necessary to implement this strategy framework, including procurement roles and responsibilities for the Programme.



2. OUR SAFE NETWORKS PROGRAMME

2.1 Overview

The overarching objective of the SNP is to achieve “a significant reduction in deaths and serious injuries”.

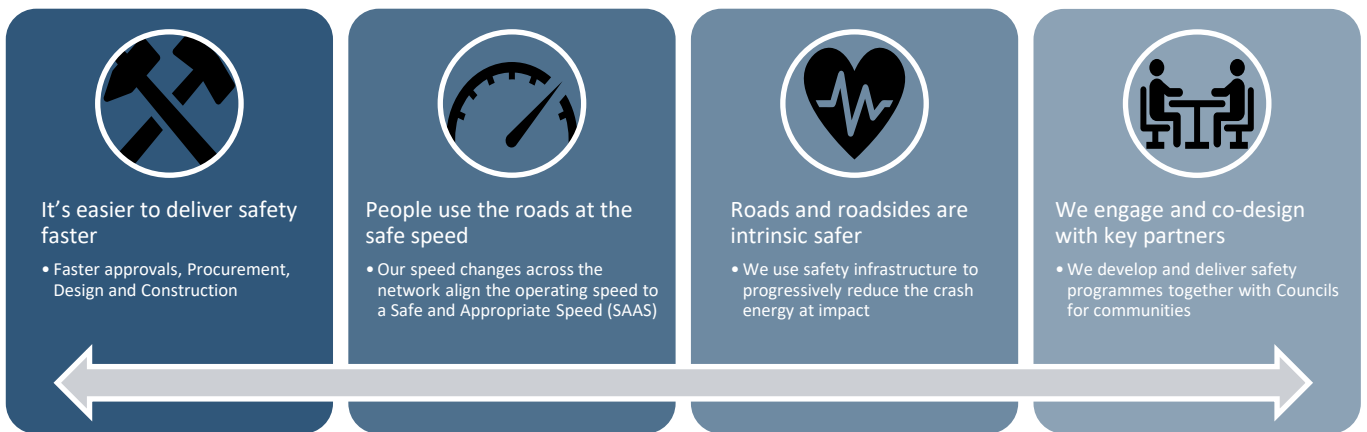
As a result of the approximately \$1.4 bn investment within the 2018-21 NLTP, the Transport Agency expects to reduce the number of deaths and serious injuries on our roads by 160 per year.

The Programme is expected to continue within the next 2021-24 NLTP as a key enabler of the Road to Zero Strategy and Action Plan, with potential funding of \$1.5 bn over the NLTP period. Through the SNP the Transport Agency will deliver infrastructure and speed management interventions that make a significant contribution to the Road to Zero outcomes.

The Transport Agency’s Procurement Function is a critical enabler of the SNP. Without externally supplied resources and the effort and expertise of industry we cannot design and deliver the required safety interventions. There is a direct correlation between the efficiency and effectiveness of procurement activity, and the speed with which we make our roads safer.

2.2 Programme Objectives

In pursuit of achieving “a significant reduction in deaths and serious injuries”, the SNP has four main objectives:



In support of these objectives the SNP has developed a number of responses that are given effect to within the SNP Programme Management Plan and will be reinforced and supported through this Strategy:

SNP Objective	Programme Response
It’s easier to deliver safety faster	<ul style="list-style-type: none"> • Dedicated SNP team • Quicker approvals processes • Pre-approved Standard Safety Interventions • Procurement Strategy
People use the roads at the safe speed	<ul style="list-style-type: none"> • Targeted programme to increase length of network at safe and appropriate speeds • Targeted education campaign
Roads and roadsides are intrinsically safer	<ul style="list-style-type: none"> • Target high risk sections of the network with physical interventions to eliminate or mitigate the probability or impact of Deaths and Serious Injuries.
Engagement led, co-design with partners	<ul style="list-style-type: none"> • Area programme managers, safety engineers and comms people to lead engagement at a local and regional level

2.3 Programme Approach

The Transport Agency is utilising a Programme management model, within Transport Services Group, to deliver infrastructure-based safety interventions. The Safer Network Programme is split into three sub-programmes:

Safe roads and roadsides: Roads and roadsides investments focus on State Highways and Local Roads with particular emphasis on high risk motorcycle routes, intersections, rural roads and sites with high levels of walking and cycling. Proven safety treatments will be applied and integrated with implementation of the Speed Management Guide.

Safe and appropriate speeds: A review and update of the safe and appropriate speed for the top 10% of high-risk corridors.

Safe level crossings: A programme to specifically target the low probability, high consequence train vs. person/vehicle collision risk.

These sub-programmes will be delivered through the following investment methods, based on funding criteria:

- **Low Cost Low Risk (LCLR)** – simple interventions and projects, generally valued at less than \$1m. Do not require a business case.
- **Standard Safety Interventions (SSIs)** – authorised as part of an overarching programme business case with a total value per-intervention of up to \$50M and meeting complexity assessment criteria.
- **Business Case** - larger, more complex projects outside of LCLR and SSI that require a separate business case due to the total value or complexity beyond the SSI construct.

2.4 Procurement Characteristics of the SNP

The SNP is a large and diverse programme with some unique procurement characteristics that have informed the development of this strategy framework. Key factors influencing this strategy include:

- A very high volume of individual investments, generally involving much smaller sized projects than the Transport Agency's procurement function is accustomed to delivering, as well as a number of medium and high value/complexity projects.
- The SSI construct means that funding gates, including requirements for business cases, differ from standard projects within the NLTP; placing greater emphasis on programme level planning and meaning that procurement planning can occur at an earlier stage than with non-SNP projects.
- Peak volumes and activities are expected to coincide with a surge in infrastructure investment across New Zealand, especially within the land transport sector, as a result of the NZ Upgrade Programme. High levels of infrastructure investment in Australia will compound capacity constraints for key skills.
- The location of projects is spread across the network, involving a combination of local authority, Kiwirail and state highway assets; with some activities geographically isolated and others expected to be in close proximity to existing or planned capital projects and maintenance programmes
- In support of the Road to Zero strategy, we expect the SNP to cross multiple NLTP periods, with a sustained volume of work, requiring development of depth and capability internally and externally.
- Accelerated and streamlined investment pathways mean that lead times between concept and delivery are shorter. The speed of delivery can be of critical importance, noting the purpose of investment is to reduce deaths and serious injuries on a specific part of the network. However, the programme seeks to maximise the number of DSIs saved per \$ spent. As the road corridor is a live network and continually changing, the priority of projects is also continually assessed -and these may change during the course of any given year or NLTP period.
- The use of standard safety interventions means designs, materials and methodologies will be common across multiple projects.

3. PROCUREMENT OBJECTIVES AND DRIVERS

3.1 Purpose

This section identifies what is important when planning, sourcing and managing contracts required for SNP, and includes:

Our Plan Source Manage Framework: a short description of the procurement lifecycle, this provides context for later stages of this strategy

Procurement Objectives: what the Transport Agency expects SNP procurement activities to achieve. These objectives are intended to inform option assessment at a project level, as well as guide the ongoing monitoring and measurement of procurement performance across the programme.

Risks: a summary of procurement related risks and intended treatments.

Best Value for Money: this section provides a programme-level view on what is valued through SNP procurement and is intended to inform planning and decision making at a project level.

3.2 Our Plan Source Manage Framework

Planning, sourcing and managing are the three key broad phases of procurement that occur through the life of an asset or contract and provide the framework for how we will undertake procurement for the SNP.



This framework is illustrated in the government procurement lifecycle which identifies eight logical stages of activity. The Transport Agency has adopted the language of 'plan, source, manage' to describe the key phases of our procurement work, as described further within our *Enterprise Procurement Strategy*

Plan

The Planning Phase of Procurement presents the greatest opportunity to identify and **create opportunities for value**. For infrastructure procurement, planning occurs at both a strategic and tactical level and is usually closely integrated with both investment and project management planning disciplines.

At a strategic level, this involves collaboration, consideration of opportunities for aggregation and smart packaging, assessment of risk and opportunity, and identifying the most appropriate contract delivery model. Tactical planning involves choosing the most appropriate supplier selection method, developing requirements and evaluation criteria, and the preparation of tender documentation.

Source

Having selected the most appropriate delivery model and supplier selection method, we engage with potential suppliers receive and evaluate responses or offers, and select the most appropriate supplier. Due diligence, refinement of requirements, negotiation of commercial terms, and developing of relationship and operating procedures may also form part of the sourcing phase.

The Transport Agency considers the Sourcing Phase to be primarily tactical in nature, putting strategies into action through the consistent application of robust procurement procedures. This is the phase within which we **secure value**.

Manage

After entering into an agreement with one or more suppliers, the Transport Agency will onboard or induct the supplier, administer and manage the contract and supplier performance, provide appropriate oversight and supervision, and continuously review the agreement. In the context of infrastructure asset improvement, often the management phase of procurement will occur under project management disciplines and allows us to **realise value, outcomes and benefits**.

Manage activity also includes the active monitoring and assessment of the performance and effectiveness of our procurement strategies and plans, and the capturing and application of lessons and learnings.

3.3 SNP Procurement Objectives

Cascaded from the Enterprise Procurement Strategy and the Infrastructure Procurement Strategy, the following six objectives apply to all procurement activity in support of the SNP.

The **purpose** of procurement activity described within the Strategy is to enable **efficient delivery of the SNP**.

1. Enable efficient delivery of the Safe Networks Programme

In doing so, we must consistently demonstrate that our procurement activities and decisions are achieving **Best Value for Money** Spent, which requires the **Active Management of Risk** and includes the pursuit of **Broader Outcomes**.

3. Actively manage risks
to safety, reputation and performance

2. Demonstrate Best Value
for money spent

4. Pursue Broader Outcomes
in support of our Position Statements and external commitments

To ensure delivery, we require ongoing access to **efficient and competitive markets** who value us as a client. We can only achieve our objectives by building and maintaining high levels of **procurement capability** within the SNP and wider Transport Agency.

5. Develop efficient, competitive and sustainable markets who value the Transport Agency as a client

6. Build and maintain high levels of procurement capability within the SNP team and Transport Agency

These objectives have been informed by legislation, the Government Policy Statement, our Statement of Intent, the expectations of our Board, requirements set by Government Procurement, and our commitments under the Construction Sector Accord.

The objectives are intended to help inform procurement planning and decision making, but will primarily be applied in the monitoring and assessing how this procurement strategy framework and SNP procurement activities perform over the first years of the programme.

Each of these objectives are interdependent of each other, noting that some trade-offs will often be required when making procurement decisions or prioritising effort.

A description of each objective in the context of SNP is provided in the table on the next page, as well as the results and outcomes we expect to achieve as a result of these objectives. Section 7 of this strategy identifies that SNP leadership and the Enterprise Procurement Team will collaborate to establish measurable targets in support of these objectives, which will help inform the success of this strategy and our approach and management of SNP procurement activities.

Procurement Objective	Description in SNP Context	Results / Outcomes
1. Enable Efficient Delivery of the Safer Networks Programme	Procurement activity has to run at pace, applying efficient and pragmatic solutions in direct support of programme timeframes and emerging priorities. Efficiency will be achieved through strong planning practices, optimised work packages, providing a predictable programme of work for suppliers, streamlined sourcing processes, and a collective low tolerance for administrative delays.	<p>Programme timeframes met.</p> <p>SNP projects procured more quickly compared with other projects / programmes.</p> <p>Demonstrable reduction in SSI costs over the life of the programme.</p>
2. Demonstrate Best Value for Money Spent	<p>In direct support of the LTMA and the Procurement Manual, we require that all procurement decisions be objectively justified on the basis of Best Value for Money. This requires us to identify what will be valued and to evaluate our options accordingly.</p> <p>Our management and measurement of projects and contracts must then assess and demonstrate the extent that the expected value is realised. Best Value for Money overarches all objectives and is explored further in s.5.3 of this strategy.</p>	<p>Procurement decisions can be justified on the basis of Best Value for Money.</p> <p>Measurement at a programme, project and contract level demonstrate achievement of best-value for money.</p>
3. Actively Manage Risk, to Safety, Reputation and Performance	<p>Risks actively considered within procurement planning, sourcing, and management, with appropriate risk management practices applied to contract management.</p> <p>Consistent application of health and safety standards, including prequalification, monitoring and reporting.</p> <p>Appropriate use of probity advisors, and active monitoring for adherence to Procurement Policy and related procedure manuals</p>	<p>Zero deaths or serious injuries occur in the performance of the SNP.</p> <p>No interruption to programme delivery resulting from contract failure or performance issues.</p> <p>Clean probity and audit reviews over programme procurement activity.</p>
4. Pursue Broader Outcomes	<p>Through SNP procurement, we will be putting an unapologetic emphasis on reducing deaths and serious injuries on the road. We see the SNP as a pivotal opportunity to demonstrate our commitment to the Construction Sector Accord including economic stimulus opportunities in response to Covid-19,</p> <p>In addition to using strategic mechanisms to pursue Accord outcomes, we will also increasingly pursue broader outcomes where this will not cause delay or complication to the speedy delivery of safety outcomes.</p>	<p>Meet construction sector accords, but providing a visible pipeline of SNP work and providing predictability to industry</p> <p>SNP contracts increasingly demonstrate a contribution to growing a skilled, sustainable construction workforce</p> <p>Opportunities to promote economic stimulus in response</p>
5. Develop efficient, competitive and sustainable markets	<p>The SNP is expected to be a long-term programme. We need to balance efficiency benefits of utilising consistent suppliers, with the need to maintain depth and competition within markets. and avoid any unintentional dependency on individuals or companies.</p> <p>Providing visibility of a clear pipeline and maintenance of a work-bank is essential to support suppliers' resource planning.</p>	<p>20% of the value of roads & roadsides professional services work openly contested outside of Consortia providers.</p> <p>Response numbers to physical works opportunities demonstrate industry interest and healthy competition.</p> <p>Strong collaborative relationships with all providers, with regular engagement.</p>
6. Build and maintain high levels of procurement capability	<p>The SNP presents a high volume of relatively low value projects over an extended period of time. This will test both our capabilities and capacity, and the early stages of the SNP are pivotal to develop capabilities necessary to sustain success across NLTP periods.</p> <p>There are opportunities to develop and test new methods and ways of working within SNP, for wider application across infrastructure procurement.</p>	<p>Lessons and learnings routinely identified, promulgated and applied.</p> <p>Development and testing of new methods to support future delivery of the SNP, NLTP and infrastructure delivery across NZ.</p> <p>Ability to share / showcase success within the Sector.</p>

3.4 SNP Procurement Risk Summary

A number of procurement-centric risks have been identified for the SNP, which are summarised below. This risk summary is not a substitute for programme and project risk management, and has been developed to inform programme management, as well as risk assessment and management within procurement planning for individual projects / contracts.

Risk Title	Risk and <i>Potential Consequence</i>	Summarised Treatment
1. Safety	<p>Accidents occur in the performance of SNP contracts.</p> <p><i>Causing death or serious injury to individuals, network disruption, and legal liability to the Transport Agency as PCBU.</i></p>	<p>Consistent application of Health and Safety policies and standards, including use of prequalification framework.</p> <p>Active management and monitoring of contract delivery.</p> <p>Promoting a programme-wide culture that reinforces the primacy of safety.</p>
2. Procedural Compliance and Probity	<p>Goals of expediency and the use of multiple external parties to manage procurement activities increases procedural risk and the potential for supplier challenges, negative publicity, or adverse audit findings in relation to procurement decisions.</p> <p><i>Negative impact on the reputation of the Transport Agency's procurement function and undermining of the objectives of the SNP.</i></p> <p><i>Reduced flexibility in future procurement methods.</i></p>	<p>-</p> <p>Consistent application of procedure manuals, delegations, and the Conflict of Interest policy.</p> <p>Transparency through publication of award notices.</p> <p>Use of independent probity advisors, per SMO21.</p> <p>Active oversight / support from the Procurement Centre of Excellence (Corporate Support).</p> <p>Ensuring appropriate independence, separation of duties, and management of commercially sensitive information between consultants</p>
3. Pipeline	<p>Delays in developing design briefs, business cases, or providing approvals disrupts the pipeline of work available to suppliers.</p> <p><i>Minimal opportunities to optimise programme delivery, due to work only becoming available project by project.</i></p> <p><i>Supplier resources may be allocated elsewhere and not be available when required. Costs may increase to offset delays.</i></p>	<p>Proactive work to develop a forward 'work bank' of requirements</p> <p>Use of surge capacity (independent consultants / professional services) to accelerate programme planning and production of design briefs.</p> <p>Active management of outputs and dependencies at a programme-level.</p>
4. Market Capacity	<p>Due to the nature of SNP requirements, recent reductions in prequalified suppliers, pandemic situation, and expanded infrastructure programmes in NZ and Australia, markets may not have the willingness, capacity, or availability of key resources to deliver SNP work, especially in key regional locations.</p> <p><i>Programme delays, due to supplier and labour force availability.</i></p> <p><i>Increased delivery costs due to an absence of competition.</i></p> <p><i>Quality failures due to capability and experience levels of available resources.</i></p>	<p>Programme optimisation, to create commercially attractive packages of work, and / or combine SNP requirements with other contracts.</p> <p>Clear pipeline of forward work, providing early visibility to markets.</p> <p>Promotion of streamlined prequalification processes to new suppliers</p> <p>Active industry engagement and communication</p>

<p>5. Programme Alignment</p>	<p>Nationwide nature of the SNP means that a lack of alignment with other procurement activity or existing contracts (including maintenance programmes) could impact on collective performance across infrastructure programmes.</p> <p><i>Impact on performance of maintenance contracts.</i></p> <p><i>Conflicting / competing procurement processes within same geographic areas.</i></p> <p><i>Inefficiencies, multiple suppliers contracted for working in same network corridor, perception of a lack of coordination and alignment.</i></p>	<p>Careful consideration of capacity and performance levels of NOC/maintenance providers before addition of SNP physical works to scope.</p> <p>Maintenance of Regional Delivery plans</p> <p>Active collaboration with Councils and monitoring of other infrastructure procurement intentions and timings (including NLTP, NZUP and maintenance programmes) to identify opportunities and deconflict overlapping tender processes.</p>
<p>6. Administrative Delays</p>	<p>Delays in completing internal paper-work, seeking endorsements and approvals under delegations, and other administration activities cause unnecessary delays in procurement and contracting decisions.</p> <p><i>Unnecessary delays - impact on reputation, programme timeframes and costs.</i></p> <p><i>Opportunity costs – leadership and specialised resources focussed on activities that do not add value to the programme.</i></p>	<p>Development of bespoke templates and workflows, rightsized for SNP.</p> <p>Promoting a programme-wide culture of intolerance for administrative delay.</p> <p>Clear understanding of roles and responsibilities, with high levels of empowerment</p> <p>Active monitoring of process efficiency, with interventions (such as amended delegations) considered as required.</p>
<p>7. Supply Chains</p>	<p>Over-demand for key materials within supply chains increase prices or delays PQ activity.</p> <p>Global impacts on supply chains disrupt local supply of key material components (e.g. pandemic, shipping disruption, exchange rate movement)</p> <p>Skill or labour shortages, due to increased infrastructure programme, and / or pandemic restrictions</p> <p><i>Delays in project delivery.</i> <i>Increased project costs.</i></p>	<p>Identification at a programme level of critical supply chains and initial assessment of potential vulnerability to inform targeted risk treatment.</p> <p>Consideration of direct bulk purchase of key offshore materials needed throughout SNP.</p>
<p>8. Supplier Performance</p>	<p>Suppliers do not perform at the level required under contract, or do not demonstrate the behaviours expected by the Transport Agency.</p> <p><i>Rework, causing delay and additional cost</i></p> <p><i>Increased risk profile for the Transport Agency</i></p> <p><i>Cost increases as a result of low bids / contentious claims and variations</i></p>	<p>Clear roles and responsibilities for managing supplier relationships and performance. Adequate resourcing.</p> <p>Contract incentives, including performance forming a key consideration in supplier selection.</p> <p>Clear specification of performance and behavioural expectations within contract.</p> <p>Active performance monitoring and contract management</p> <p>Consistent use of PACE / KPI and KRA frameworks to record and track performance outcomes.</p>

3.5 Achieving ‘Best Value for Money’

In accordance with the LTMA (2003), the NZ Transport Agency Procurement Manual, and our internal Procurement Policy – all procurement procedures must seek to obtain ‘best value for money spent’. Our Policy requires that all procurement decisions must be justifiable on this basis.

The Transport Agency defines Best Value for Money as:

“The most effective combination of cost, quality, benefit and risk to meet a requirement.”

Within an SNP context, a **requirement** is set by the Programme and will usually be articulated within a design brief or business case. This will generally be the improvement or creation of an asset, for the purposes of reducing deaths and serious injuries.

The four elements of best value, which must be considered are:

Cost: all expenditure and resources required over the life of the asset or contract.

Quality: the extent that a specification, performance level, or safety standard is met.

Benefit: outcomes, results and impacts (and can include disbenefits).

Risk: the degree of certainty (of cost, quality and benefit).

The example below helps to illustrate how these factors can be applied to inform procurement decision making. The table on the following page establishes principles to guide the use of Best Value for Money as a decision support tool within the SNP.

EXAMPLE: USING BEST VALUE FOR MONEY TO CONSIDER AND JUSTIFY A DIRECT APPOINTMENT

For example, an intention to directly appoint a supplier to perform physical works within the Roads and Roadsides subprogramme must be justified on the basis of best value for money. Example considerations would include:

- **Cost:** whether the decision to direct appoint will result in a higher delivery cost than through a competitive process, the extent that this may be offset by lower procurement costs - and whether this will have a material impact on the programme’s ability to achieve objectives within budget.
- **Quality:** whether the chosen supplier has the necessary qualifications and experience for the job, and the extent that they have demonstrated consistent performance and we have confidence in their ability to safely deliver to the required level.
- **Benefit:** how urgent the requirement is and the extent that the use of direct appointment will achieve a faster safety intervention than a competitive process, and whether there are any other benefits or impacts of this approach (such as a negative impact on market conditions).
- **Risk:** whether the use of direct appointment provides more or less certainty to the programme of cost, quality, and benefit

The programme may conclude that (a) direct appointment will likely result in a higher cost than a tender – but within budget, (b) the contractor’s prequalification level and recent performance provides a sufficient level of confidence in quality, and (c) their current mobilisation within the same network corridor will definitely achieve an urgent safety intervention faster than would be achieved by a different supplier after a competitive tender process.

In this case, the importance of the benefit and the certainty of this outcome outweigh the other considerations, and therefore – with appropriate evidence - a direct appointment can be recommended and justified on the basis of Best Value for Money.

Factor	What is important to us, and how we will achieve it
Cost:	<p>Maximising safety interventions and DSI reductions within budget Reducing the cost of delivering safety interventions over time</p> <p>Use of SSIs will provide consistency of 'whole of life' costs for asset creation or improvement. For higher value non-SSI interventions, business case development will identify total costs associated with different options and enable informed decision making.</p> <p>Ensuring a healthy proportion of SNP work is priced through competitive tender will inform our understanding of costs and promote efficient markets.</p> <p>Benchmarking between contracts and providers, building a knowledge base of costs for standard activities and interventions, and the use of independent cost estimation services will assist in validating cost efficiency, especially in the absence of price-based competition.</p>
Quality	<p>Adherence to Standards, and Consistency of Performance Delivering projects within agreed timeframes</p> <p>Use of prequalification and standardised non-price attributes (NPAs).</p> <p>Active management and monitoring of supplier performance and compliance</p> <p>Using performance results the award of future SNP work, to incentivise consistent performance.</p>
Benefit	<p>Primary Considerations</p> <ul style="list-style-type: none"> - Direct contribution to DSI reduction - Speed of programme delivery (safety faster) <p>Secondary Considerations</p> <ul style="list-style-type: none"> - Impact on the wider infrastructure programme - Development of regional markets - Benefits against the Transport Agency Broader Outcomes framework - Development of new planning, procurement and delivery methodologies <p>Consideration of benefits in procurement planning and decision making, including appropriate use of requirements and weightings within evaluation methodologies.</p> <p>Inclusion of objectives and measures within contract and performance management frameworks, with relevant reporting and benefit realisation mechanisms in place.</p> <p>Smart-packaging of work, providing suppliers with opportunities to innovate in delivery</p>
Risk	<p>Zero compromise on safety standards and expectations, i.e. no risk appetite for safety risks. SNP to consider informed acceptance of (non-safety) performance and cost risk in order to achieve efficiencies, develop healthy markets and promote innovative practices</p> <p>Use of prequalification, NPAs and contract conditions to reinforce expectations and requirements</p> <p>Smart-packaging of work, allowing suppliers with opportunities to innovate in delivery</p> <p>Allowance for innovative methods and practices within tender processes / proposals.</p> <p>Performance based award of future work, rewarding successful performance and building confidence in successful suppliers.</p> <p>Building knowledge of costs for repeated activities, to de-risk cost considerations</p>

4. STRATEGIC PROCUREMENT RESPONSES

4.1 Introduction

In response to the objectives and risks identified within Section 3 and considering how Best Value for Money principles apply to the Programme - the SNP has developed a number of strategic procurement responses.

These strategic responses are described in the following tables, generally grouped within the Plan, Source, Manage framework. As well as providing principles to guide SNP procurement planning and decision making, each response has a number of practical applications, which will be applied by the Programme and directly inform the procurement pathways described in Sections 5 and 6. The strategies described are intended to apply across all SNP procurement activity, except where identified as specifically relating to Physical Works (PW) or Professional Services (PS).

4.2 Strategic Response to Procurement Planning

Strategic Response	Description and Practical Application
<p>4.2.1</p> <p>Programme Optimisation and Smart Packaging of work</p>	<p>Procurement forms a key element of programme optimisation. We will utilise the smart packaging of work to mitigate risk and achieve efficiencies in sourcing, design and delivery.</p> <p>At an investment and programme management level, SNP will consider how best to aggregate individual investments into projects, and to sequence programme activity. Procurement considerations, (including assessment of market conditions and the wider infrastructure programme) will form a key input to programme optimisation.</p> <p>Our intention is to segment SNP requirements, and make deliberate and informed decisions as to whether to contract for any individual project or intervention, or to aggregate (or disaggregate) work to best effect – both for professional services and physical works.</p> <p>While disaggregation can create opportunities for different tiers of the market, present lower levels of risk for suppliers and SNP, and allow for requirements to be more easily incorporated into existing contract delivery models (such as maintenance contracts or Council managed projects) – as a general principle we expect SNP’s smart packaging to result in the aggregation of requirements, in order to achieve:</p> <ul style="list-style-type: none"> • Economies of scale (material, mobilisation etc) • Reduced procurement costs and delays • Commercial risk to be spread and managed across multiple projects • Reduced management and MSQA service costs <p>Practical Application:</p> <ul style="list-style-type: none"> - Procurement considerations play a key role in programme planning / optimisation activity - Development of a forward pipeline and work-bank is essential, to allow for smart packages of work to be developed and for PS suppliers to plan resource utilisation - SNP procurement must maintain awareness of the wider infrastructure programme - Procurement pathways for SNP must allow flexibility to take advantage of emerging opportunities
<p>4.2.2</p> <p>Regional Solutions & Collaboration</p>	<p>The SNP is a nationwide programme of work delivered regionally. We will take a regional and corridor-based approach to contracting for physical works, and maintain Regional Delivery Plans to support planning and collaboration.</p> <p>Physical Works will generally be completed by the same pool of Contractors whether local roads or state highway, funded through the NZ Upgrade Programme or the NLTF - therefore collaboration and consideration of regional market conditions is a key element of programme-level procurement planning.</p>

	<p>Options for national-level interventions should continue to be considered, however the default approach to programme optimisation and developing smart contract-packages is to tailor these to the requirements and unique characteristics of each region, applying a 'network corridor' approach where possible.</p> <p>Taking a regional approach to PW procurement planning will require active collaboration, and consideration of:</p> <ul style="list-style-type: none"> • existing or intended capital projects (managed by the Transport Agency or Councils) • planned maintenance activities and contractor capacity • geographic and weather conditions • supply chain and market conditions, opportunities and constraints <p>Development and maintenance of Regional Delivery Plans will provide visibility of timing and procurement pathways for the SNP - assisting with project planning, industry engagement, Council collaboration and stakeholder communication. We expect that once piloted by SNP, the construct of a Regional Delivery Plan will evolve to encompass all capital projects managed by the Transport Agency.</p> <p>Practical Application</p> <ul style="list-style-type: none"> - Segmentation and optimisation will have a heavy focus on regional / network corridor-based approaches - Maintaining a visible pipeline of potential work, to inform regular and structured industry engagement activities, aligned to the wider infrastructure programme - SNP procurement must maintain awareness of regional conditions and actively collaborate with regional stakeholders - Expectation for SNP to develop and test the construct of a Regional Delivery Plan as an output of programme optimisation - Procurement pathways for SNP must allow flexibility to take advantage of emerging opportunities at a regional level
<p>4.2.3</p> <p>Integration of Professional Services and Physical Works</p>	<p>Constructability, and the procurement pathways for Physical Works must be key considerations within design activities.</p> <p>While SNP's procurement needs can generally be split into two categories i.e. Professional Services and Physical Works, and the majority of the programme is expected to be delivered through a traditional design then construct model, it is important that the final construct between the two categories is closely integrated and that procurement planning is led at a programme level, rather than within individual projects.</p> <p>This is important not only to support programme optimisation, but to enable constructability to be a key driver of design. To achieve strategic objectives, SNP must consider the optimal timing of PW procurement (relative to pre-implementation activities) and prevent delays associated with projects moving sequentially from one phase to another (e.g. project activities pausing during PW tendering).</p> <p>Procurement planning, and the management of PS suppliers has to allow for a programme level approach to driving PW procurement.</p> <p>Breaking physical works requirements into separable portions can allow for earlier mobilisation and work commencement, allowing concurrent design of later portions and for these to be used as performance incentives for constructors.</p> <p>Practical application:</p> <ul style="list-style-type: none"> - Programme planning identifies the optimal level of design work necessary before making smart packaging decisions / determining PW procurement pathways - inclusion of PS supplier representatives within appropriate elements of programme level procurement planning - identifying the optimal level of design work necessary before tendering or otherwise awarding physical works contracts, and identifying what is necessary before PW can commence

	<ul style="list-style-type: none"> - physical works requirements being staged within separable portions, allowing for earlier procurement and commencement of physical works during concurrent design of later portions - involving neutral or pre-contracted PW suppliers, NOC representatives or independent advisors within key stages of the design process to test constructability, inform Safety in Design, and early site investigations.
<p>4.2.4</p> <p>Efficient and Pragmatic Procurement Planning and Decision Making</p>	<p>Without sacrificing quality, compliance or professionalism – our approach to procurement planning and decision making must be proportionate, efficient and responsive.</p> <p>While this strategy calls for a strong emphasis on strategic procurement planning, it is expected that this occurs proactively and at a programme level, not sequentially to other pre-implementation activities. At a project level, procurement planning should be proportionate to the risk, value and complexity of the investment(s) and documentation should be right sized to provide transparency and justification for decisions and enable action to occur – without wasting unnecessary time and effort.</p> <p>Development of a knowledge bank, exemplar document library, and a collective culture that challenges delay and inefficiency, will assist the programme to become increasingly efficient in procurement planning and decision making.</p> <p>Practical application</p> <ul style="list-style-type: none"> - Mechanisms / forums to test the viability / justification for a proposed approach, before committing to detailed planning - Clear briefs to PS providers about the extent of procurement planning required to inform decisions and action - Development of bespoke templates and workflows to facilitate efficient procurement planning and decision making - Clear roles and responsibilities within SNP procurement activities - Measurement of procurement planning and decision times, to establish a benchmark and an evidence base to justify any changes to delegations or workflows (if required) - Programme team promotes and requires knowledge sharing, IP and document transfer and provides access to exemplar documents - Leadership culture that challenges and addresses delays and inefficiencies

4.3 Strategic Response to Sourcing

Strategic Response	Description and Practical Application
<p>4.3.1</p> <p>Consistency of Advisory and Professional Services Suppliers</p>	<p>Efficiency and Value will be achieved through consistency in the suppliers and personnel we appoint for advisory and pre-implementation work, and by providing those suppliers with certainty of forward work - to improve resource allocation and utilisation.</p> <p>As a general principle, the SNP will avoid 'changing horse mid-stream', recognising the efficiency benefits of PS suppliers completing full design and managing implementation activities.</p> <p>Where panels or consortium have been established through open-competitive tender, the Transport Agency is required to follow the work allocation processes and procedures established for that supply arrangement. Subject to those procedures, the Transport Agency is not obligated to undertake competition: and wherever possible will seek to allocate work on the basis of experience, and current and sustained performance - - providing incentive for suppliers to achieve SNP outcomes and driving consistency and continuous improvement within practice and approach. Establishment and maintenance of standing arrangements for PS service is a key strategy for the SNP, but will be balanced with offering work to the general market so as to promote healthy markets and benchmark costs and performance.</p> <p>A further strategy for achieving best value for money from professional services expenditure, is providing our providers with certainty of the forward work programme. This enables the proactive allocation of resources with the right level of skills and experience</p>

	<p>and allows our suppliers to optimise the utilisation of their resources. Providing certainty – not only of the pipeline of potential work – but also of who is undertaking the work, will assist in optimising resource allocation and managing cost.</p> <p>Practical Application</p> <ul style="list-style-type: none"> - Use of consortia and panel arrangements for PS requirements - Robust management plans and performance management mechanisms to support the justification of decisions to directly award work - Subject to performance and requirements for competition, retention of same supplier for all PS work on a project - Development and maintenance of a pipeline of PS requirements, and a work bank where possible - Working to create a ‘team of teams’ culture within SNP’s approach to pre-implementation activity, driving collaboration and cooperation between individuals, companies and consortia.
<p>4.3.2</p> <p>Flexible Procurement Pathways for PW</p>	<p>In order to capitalise on Programme Optimisation and Smart Packaging, SNP requires the flexibility to pursue emerging opportunities and employ new ways of Sourcing</p> <p>In pursuit of ‘Delivering Safety Faster’ and managing a high volume of projects – the SNP requires flexibility in how it contracts for Physical Works. This may include the ability to justify direct appointments at higher levels than traditionally approved, make variations to existing contracts to include SNP scopes, utilise Council managed contracts or projects for SNP scopes, and to award suppliers packages of work comprised of multiple projects at different stages in the design / funding cycle, (where future projects are subject to approval and/or at risk for performance).</p> <p>Practical Application</p> <ul style="list-style-type: none"> - Permissive strategy framework providing multiple procurement pathways - Mechanisms / forums to test the viability / justification for a proposed approach, before committing to detailed planning - A range of sourcing options for PW, able to be justified on the basis of Best Value for Money, allowing for expedient award of work when circumstances warrant it. - Procurement Team and SNP seeking early / proactive approval to use procedures not yet approved under the NZ Transport Agency Procurement Manual - Ready availability of probity support, and expert procurement advice to support new ways of sourcing, while avoiding procedural / compliance risk
<p>4.3.3</p> <p>Efficient Sourcing Practices</p>	<p>The Volume of Work within the SNP Requires Efficient and Pragmatic Sourcing Solutions – for the Transport Agency and for industry.</p> <p>SNP will utilise tailored procurement templates and documentation to ensure administrative effort is as efficient as possible, with tender costs and delays minimised for all parties - while still satisfying compliance requirements.</p> <p>The effectiveness of procurement processes - including delegations and workflows - will require close monitoring by SNP leadership, to ensure that these are fit for purpose and that any recommendations for changes are evidence based and provided to Senior Managers and Corporate Support proactively.</p> <p>Practical Application</p> <ul style="list-style-type: none"> - Reinforcement of prequalification within PW sourcing, allowing a reduction in the NPAs to be applied and volume of information to be evaluated - Use of panels or other standing arrangements, allowing rapid engagement - Use of consistent templates and schedules - Aggregation of requirements for PW, allowing multiple projects to be contracted for - through a single sourcing exercise. - Performance based work allocation: where PS panel members or suppliers can be directly awarded future work based on demonstrated performance – and where PW providers may be awarded packages of work comprising multiple projects - with future projects within the package being ‘at risk’ based on performance criteria.

4.4 Strategic Response to Managing SNP Procurement

Strategic Response	Description and Practical Application
<p>4.4.1</p> <p>Active contract and supplier relationship management</p>	<p>We will be curious, proactive and disciplined in our management of SNP supplier relationships and contract performance. We will leverage relationships to achieve greater value and use performance track record within the Programme to directly inform and justify procurement decisions.</p> <p>While a number of contracting and contract management activities will be undertaken on our behalf by PS firms or independent advisors on the programme, it is essential that the Transport Agency (and SNP specifically), actively engage with our suppliers to ensure healthy productive and mutually beneficial relationships, and that risks are actively managed. We cannot afford to defer or entirely abdicate responsibilities to 3rd parties and we must be both visible and engaged in the measurement and management of performance.</p> <p>We will utilise PACE consistently, configuring performance criteria to suit SNP priorities if necessary (including use of a KPI / KRA regime), moderate scores and utilise this information to inform our decisions about the award of future work.</p> <p>Practical Application</p> <ul style="list-style-type: none"> - Creation of forums for exploring opportunities and sharing insights with key SNP suppliers, focussed on strengthening relationships, resolving potential issues before they manifest, and achieving mutual value - We have clearly defined responsibilities within SNP for managing supplier relationships and contracts, especially where 3rd parties perform this function on our behalf - Performance management occurs regularly and consistently and can be acted upon with confidence - Sufficient resourcing and/or budget is allocated to perform these activities - We are proactive and confident in having difficult conversations and driving the performance standards we expect - Provision of contract and relationship management training for SNP team members if required, especially for new joiners - Documented plans are maintained for the management of panels, consortia and key contracts - Regular monitoring of SNP contract and supplier relationship activities to provide assurance and confidence to governance and stakeholders
<p>4.4.2</p> <p>Information capture and becoming an intelligent client</p>	<p>We will capture and apply data, insights, and learnings from programme delivery, to inform programme optimisation and drive iterative improvement.</p> <p>As our knowledge and experience grows, we can employ more sophisticated procurement methods and focus on quality and benefit, rather than cost and risk. We will ensure learnings are captured and applied, knowledge is shared, and information and insights</p> <p>The SNP will ensure that work-products, information and insight developed by all suppliers, especially PS firms, is routinely transferred to the Transport Agency and that IP ownership is not an impediment to consistency of practice or innovation.</p> <p>As an ongoing investment programme, the SNP will find increasing efficiency as lessons are learnt and the body of experience and collateral grows. In order to avoid unnecessary re-work, and to achieve pace and consistency within the programme - the SNP will actively share knowledge, work products and lessons between providers. While protecting commercially sensitive information when required contractually to do so, the SNP will promote a collaborative 'best for NZ' culture among its suppliers.</p> <p>Practical Application</p> <ul style="list-style-type: none"> - Programme will require consistent processes and methods for document and data capture, especially from work managed by 3rd parties on our behalf, to ensure that this can be aggregated, analysed and insights applied

	<ul style="list-style-type: none"> - Development of a 'cost book' for similar activities (PS and PW) from which to apply benchmarking, support negotiation and assist in measurement of performance - Procurement processes routinely reviewed for lessons and learnings, and fed back into programme optimisation activity and
<p>4.4.3</p> <p>Real time assurance and Connection to the Corporate Centre</p>	<p>We will utilise reviews, control points and independent probity support within our procurement processes to provide real-time assurance on the integrity and compliance levels of SNP procurement. The Procurement Centre of Excellence will be hardwired into the SNP structures and governance.</p> <p>Due to the speed at which procurement activity will occur, the number of 3rd parties supporting or driving procurement activity on behalf of the Transport Agency, and the range of procurement pathways available to the SNP – leaders and delegation holders require assurance and confidence that the recommendations they receive are appropriate and compliant. Proactive work is required to achieve approvals for procurement pathways and decisions that sit outside of our standard toolkit or thresholds.</p> <p>We will utilise the construct of a 'Procurement Lead' within the SNP, responsible for linking the Procurement Centre of Excellence and Probity services into the programme and providing an independent review over recommendations and decisions within the programme. This will ensure that the Procurement Centre of Excellence has visibility of key activities and decisions, and control over the performance of third parties undertaking procurement on our behalf.</p> <p>Practical Application</p> <ul style="list-style-type: none"> - Appropriately skilled and experience resource(s) required to fulfil the role of SNP procurement lead - Budget requirement for targeted and routine probity advice and review - Reviews and assurance happen iteratively and organically within procurement planning and decision making, so as not to cause delays and bottlenecks - Senior Manager Procurement (or delegate) fulfils governance role within the programme to provide further alignment of SNP with the Centre

5. PROCUREMENT PATHWAYS FOR SNP ADVISORY AND PROFESSIONAL SERVICES

5.1 Overview

The SNP's requirements for advisory and professional services include support to programme management, business case development, pre-implementation activities including design and procurement, MSQA, and audit.

Our primary approach to contracting for professional and advisory services is to utilise standing contract arrangements - including contracted consortia and panels – in order to achieve efficiencies in sourcing, as well as efficiency and consistency in work through the use of suppliers able to build familiarity and expertise with our SSIs, internal methodologies, stakeholders and the programme team.

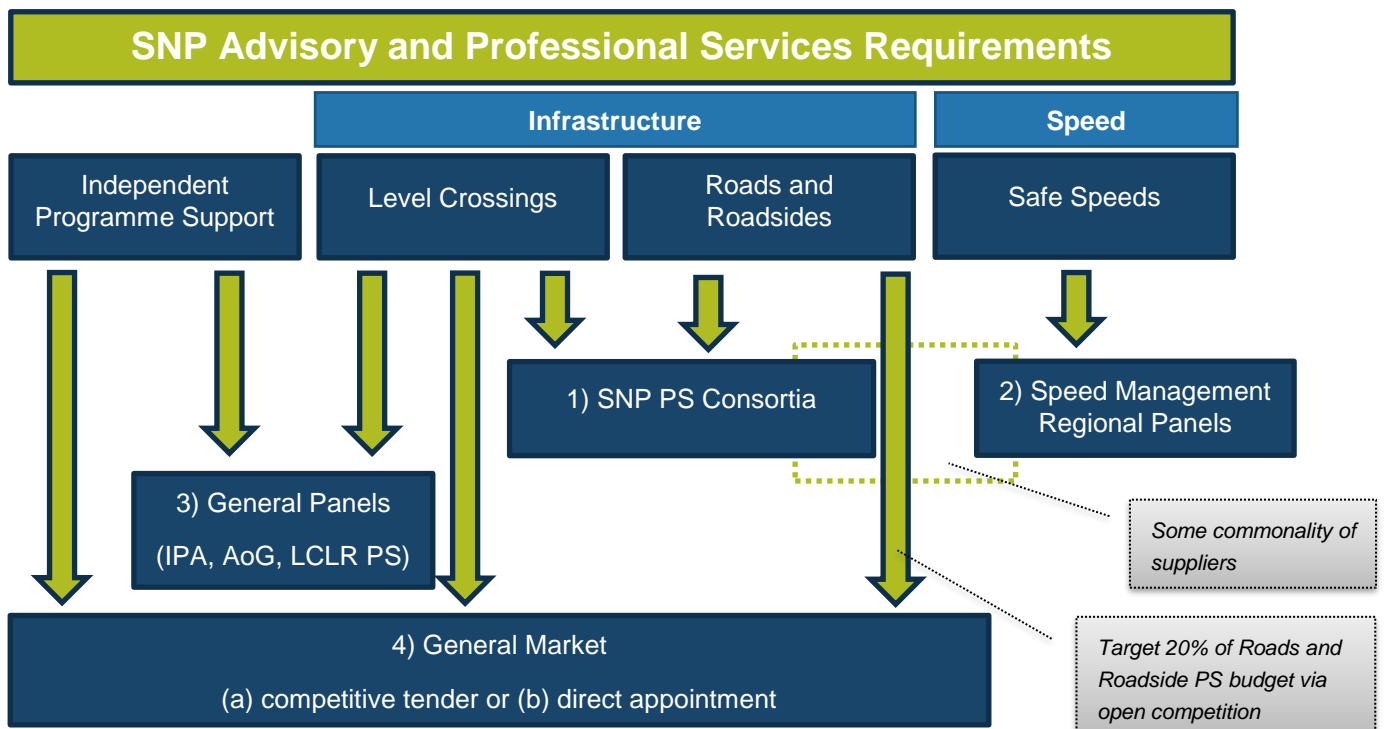
The use of consistent suppliers via standing arrangements will be balanced with creating opportunities for competition, and building depth within regional professional service markets. The SNP is committed to developing and maintaining healthy professional services markets, especially at a regional level.

5.2 Procurement Pathways for Professional Services

Advisory and Professional Services requirements for the SNP have been segmented into four groups, reflecting technical specialisms and benefits from the separation of functions. Segmentation reflects the SNP's three sub-programmes, as well as independent support to programme management.

While these segments assist in determining the appropriate sourcing approach – (including use of existing panels and consortia) - procurement planning will look across sub-programmes to identify commonality of requirements, and opportunities for the optimal sequencing and alignment of work.

The diagram below and table over-page identify and describe the most common PS procurement pathways to be followed by SNP.



Note: the above diagram does not account for existing infrastructure activity such as BOOST and LCLR work funded by the SNP but contracted through existing suppliers including NOC providers.

PS Procurement Pathway	Circumstances for use	Approach Informed By
1. SNP (Roads and Roadsides) Professional Services Consortia	<p>Most PS requirements arising from Roads and Roadsides sub-programme. Also available to meet requirements across other sub-programmes.</p> <p>The first 15% of design for all Roads and Roadsides activities</p> <p>Remaining design/pre-implementation and MSQA - for work not offered to the General Market</p>	<p>Consortia Management Plan</p> <p>Capability and capacity of each Consortia</p> <p>Experience and performance of each Consortia</p> <p>Healthy markets scheme</p>
2. Speed Management Regional Panels	<p>Most PS requirements arising from the Speed Management sub-programme</p>	<p>Speed Management Panel Plan</p> <p>Regional Location</p>
3. General Panels (IPA, low cost low risk regional panels, AoG Consultancy Panels)	<p>Where independence from existing panel or consortia members is required or advantageous, or work falls outside of the scope of those arrangements.</p> <p>Also beneficial where specialised or unique skills and experience are required, and not available through consortium or panel arrangements.</p>	<p>Panel Management Procedures</p> <p>SMO21, SM030</p>
4a. Competitive Tender (open or closed)	<p>20% of Roads and Roadsides requirements – with projects selected to drive performance and value from consortia members, and to maintain / develop healthy PS markets, especially at a regional level.</p> <p>For any requirement where competition will improve 'value for money'</p>	<p>Consideration of Best Value for Money</p> <p>SM021, SM030</p>
4b. Direct Appointment	<p>As above: but only in situations of urgency, where there is an absence of competition for technical reasons, or if otherwise objectively justifiable on the basis of Best Value for Money.</p>	<p>Consideration of Best Value for Money</p> <p>SM021, SM030</p>
5 Other existing Contract Arrangements (including NOCs)	<p>Where SNP requirements have already been contracted prior to the development of this strategy.</p> <p>Small, low cost / low risk requirements, where knowledge and experience are readily available through a NOC.</p>	<p>Scope of existing contract.</p> <p>Capacity and skill set of suppliers.</p>

5.3 Independent Programme Support Requirements

Overview of Requirement

The SNP will have ongoing requirements for expertise and professional services to enable programme management activities, and for activities requiring independence from other PS providers.

This may include independent audit functions, expertise and capacity to support the procurement of professional services, independent cost estimation, programme-level assurance, communication support, business case development, and financial and project management resourcing. SNP may also require external expertise and support to develop initial design briefs needed prior to the engagement of professional service firms. Planning for these requirements is the overall responsibility of the SNP's leadership team and ultimately the Portfolio Manager.

Planning

When considering how to meet emerging programme needs, the SNP will consider:

- Whether the skills or expertise are available within the wider Transport Agency, either within Transport Services or other supporting Groups

- The appropriateness and value of utilising external suppliers, compared to the use of permanent or fixed term employees
- Potential to develop a dependency on individuals or specific suppliers, and the implications of this occurring
- Similarity of requirements to those required for other Transport Agency programmes and projects, and whether capability could or should be shared
- Whether the requirement is likely to be recurring/ongoing through the life of the programme, and how this may impact on the above considerations, form of relationship, and the total foreseeable cost of the services
- The extent of independence required in the work, and potential for real or perceived conflicts of interest in using external suppliers that may be involved in the design or delivery of projects.

Sourcing

Any external resource requirements of the SNP to support general Programme Management activities will be sourced through one of two routes:

- Existing panel arrangements – including the Independent Professional Advisors (IPA) contract panel, All of Government Consulting Services panels, or the Low-Cost Low Risk PS Panel. In all cases SNP must apply the rules and procedures of the relevant panel and utilise standard forms of agreement.
- Open market: utilising openly advertised, closed contest or direct appointment procedures in accordance with SM021, SM030 and SNP delegations. While subject to individual procurement plans, providers will generally be selected utilising a PQM methodology, and then engaged and managed through a CCCS agreement.

Where an internal Transport Agency team outside of the SNP is used to support programme requirements, and external capability is needed by that Group, procurement of the capability will be responsibility of the relevant Business Group.

5.4 Level Crossings Sub-Programme Requirements

The Level Crossing sub-programme requires pre-implementation and MSQA services, and may have some call for business case development support.

The default approach to sourcing Professional Services suppliers for this sub-programme is to utilise the SNP Professional Services Consortia, however depending upon the degree of specialist advice required, and the volume of work anticipated, the SNP may elect to approach the open market through a new sourcing process and / or to

Any decisions to utilise the panel or consortia arrangements established for the Safe Speeds or Roads and Roadsides sub-programmes, need to be treated as a formal change of scope to those respective arrangements. Such a change does not require an amendment to this Strategy, but the rationale should be carefully considered and documented by the SNP leadership team, and procedural advice must be taken from the Enterprise Procurement Team.

5.5 Safe Speeds Sub-Programme Requirements

The Safe Speeds programme will predominately require:

- technical verification of MegaMaps outputs
- road safety audits
- community and customer consultation
- development of recommendations
- pre-Implementation activities including design and procurement
- MSQA for physical works.

A regional Professional Services panel has been established to support this scope. It is expected that the regional panel will satisfy all PS requirements for the sub-programme. Any requirements unable to be met by the panel will be sourced through the open market in accordance with SMO21 and SMO30.

A Panel Management plan will be established and maintained, that will set out:

- Procedures and principles for the allocation of work among panel members
- Pricing methodologies for different stages of design and PS work
- Relationship management and collaboration mechanisms
- Performance management framework for panel members
- Transport Agency responsibilities for managing the Panel and work commissioned through it

5.6 Roads and Roadsides Sub-Programme Requirements

Roads and Roadsides is the largest component of the SNP, and is comprised of LCRL, SSIs, activities from the broader NLT / PGF programmes, as well as larger investments subject to business cases. Professional service requirements for the programme include:

- business case development
- design (working to Transport Agency developed design briefs),
- other pre-implementation activities including consultation / engagement, and procurement of physical works contracts
- MSQA of physical works contracts

Requirements for professional services will either be met through the Roads and Roadsides Professional Services Consortia arrangement, or under a 'healthy market' scheme where a target 20% of work will be offered or competed outside of the Consortia arrangement.

The Transport Agency will identify which projects will be offered through the Healthy Market scheme independently of any input from Consortia members, or other advisors who may have an interest in competing for this work.

Professional Services Consortia: Overview

Procurement of professional services arrangements for the Roads and Roadsides sub programme was undertaken in mid-2019, following an agreed Procurement Strategy. Two Consortia of professional services firms have been contracted for this work. The scope of the Consortia allows for a wider range of work to be contracted through this arrangement.

A Consortia Management plan will be established and maintained by the programme, that will include:

- Procedures and principles for the allocation of work between Consortia
- Relationship management and collaboration mechanisms
- Pricing methodologies for different stages of design and PS work
- Performance management framework
- Transport Agency responsibilities for managing the Consortia and work commissioned through it

The Transport Agency has entered into standing-CCCS agreements with each consortium. The award of a new project or requirement will be treated as a variation to each CCCS agreement and – accordingly - delegations relating to the variation of PS contracts will apply to the award of new work (as well as to changes to existing scopes).

Any change to this contracting mechanism will not require an update of this Strategy, but the rationale should be carefully considered and documented by the SNP leadership team, and procedural advice must be taken from the Enterprise Procurement Team.

Work Allocation Between Consortia Members

Processes for the allocation of work between the Consortia is subject to the Consortia Management Plan, however the programme will apply the following principles:

- we will take a collaborative approach in working with Consortia members, to identify opportunities to allocate of work to the party best placed to successfully deliver, in the best interests of the SNP.
- subject to acceptable performance and value, we will seek to fairly manage volume allocation between the Consortia and to utilise available capacity and expertise
- generally - for reasons of efficiency and consistency - the consortium undertaking the first 15% of design work will complete the remaining PS work on the Project unless:
 - the project has been previously identified for the healthy-market process
 - there are compelling reasons (such as price, performance issues or capacity constraints)
- subject to delegated authority approval, the SNP Portfolio Manager has responsibility for the allocation of work between the two Consortia - and the Transport Agency is under no obligation to provide a minimum volume of work to either consortium
- SNP will be transparent in its decision making, providing visibility of work-allocation decisions and the justification for those decisions

- Within the context of ‘best value for money’ - where both parties signal interest in a specific project or requirement - justification for the award of work between Consortia members will be on the basis of either:
 - best fit for project: based on experience, availability of resource, alignment with other work (geographically or technically)
 - previous and current performance: incentivising high and sustained performance of teams and individuals
 - direct competition: receiving and evaluating proposals from each of the consortia

- we will seek to minimise administrative delay and process costs involved in competitive activity between the consortia, except where there is a compelling reason to conduct this (e.g. situations involving an especially high value or otherwise desirable project or work package of interest to both parties), or when it is in the interests of driving efficiency and performance changes within the consortia construct.

Healthy Market Scheme

A target minimum of 20% (by value) of all Roads and Roadsides professional services pre-implementation and MSQA work will be offered or competed outside of the Consortia arrangement.

The purpose of this is to promote competition, enable the benchmarking of consortia members’ pricing and quality, and to maintain healthy, competitive markets through continued access to Transport Agency work, especially that with a safety focus in regional locations.

A pipeline of future opportunities (describing scope, technical and experience requirements, and the geographic location of work) will be maintained and made available to potential suppliers – so as to provide visibility of our intentions and allow the market to plan accordingly. Procurement lead times must be carefully managed by the SNP, so as to ensure that the Healthy Market approach does not impact on the timing of safety interventions / overall programming.

Sourcing of services will be subject to individual procurement plans, developed and approved in accordance with SM021 and SMO30.

Members of the Consortia, including their constituent members - shall typically be excluded from responding to these opportunities. To enable fair competition and protect commercially sensitive information, consortia members will also not be involved in sourcing/evaluation/supplier selection, or in performance management of work allocated outside of the consortia.

Changes to Sub-Programme and Consortia Scope

Development of initial design briefs, (prior to the engagement of a Consortium or ‘healthy market provider’), is intended to be managed at a Programme level utilising Transport Agency resource or independent advisors.

However, in the interests of programme expediency – SNP may elect to extend the scope of consortia services to include the full or part production of design briefs and / or to offer these services via the healthy market approach described above.

Such a change does not require an amendment to this Strategy, but the rationale (and issues such as potential conflicts of interest) should be carefully considered and documented by the SNP leadership team, and procedural advice must be taken from the Procurement Lead / Enterprise Procurement Team before making such a change to Consortia scope.

It is further recognised that projects and investments from other programmes may seek to utilise the SNP consortia construct to expedite design and other pre-implementation activities for small to medium sized projects. Consideration should be given to the maintenance of a healthy competitive market for professional services, the capacity and relative priorities of the consortia and the scope of the services originally tendered for. Advice must be taken from the Procurement Lead / Enterprise Procurement Team before wide expansion of the Consortia scope.

6. PROCUREMENT PATHWAYS FOR SNP PHYSICAL WORKS

6.1 Overview

This section restates and explores some of the principles associated with procurement planning, programme optimisation and smart packaging introduced in Section 3, and then presents the most common procurement pathways expected to be utilised by the SNP in order to achieve the objectives of this Strategy. Some further guidance is provided to support the preparation of project-specific procurement plans.

6.2 Approach to Procurement Planning

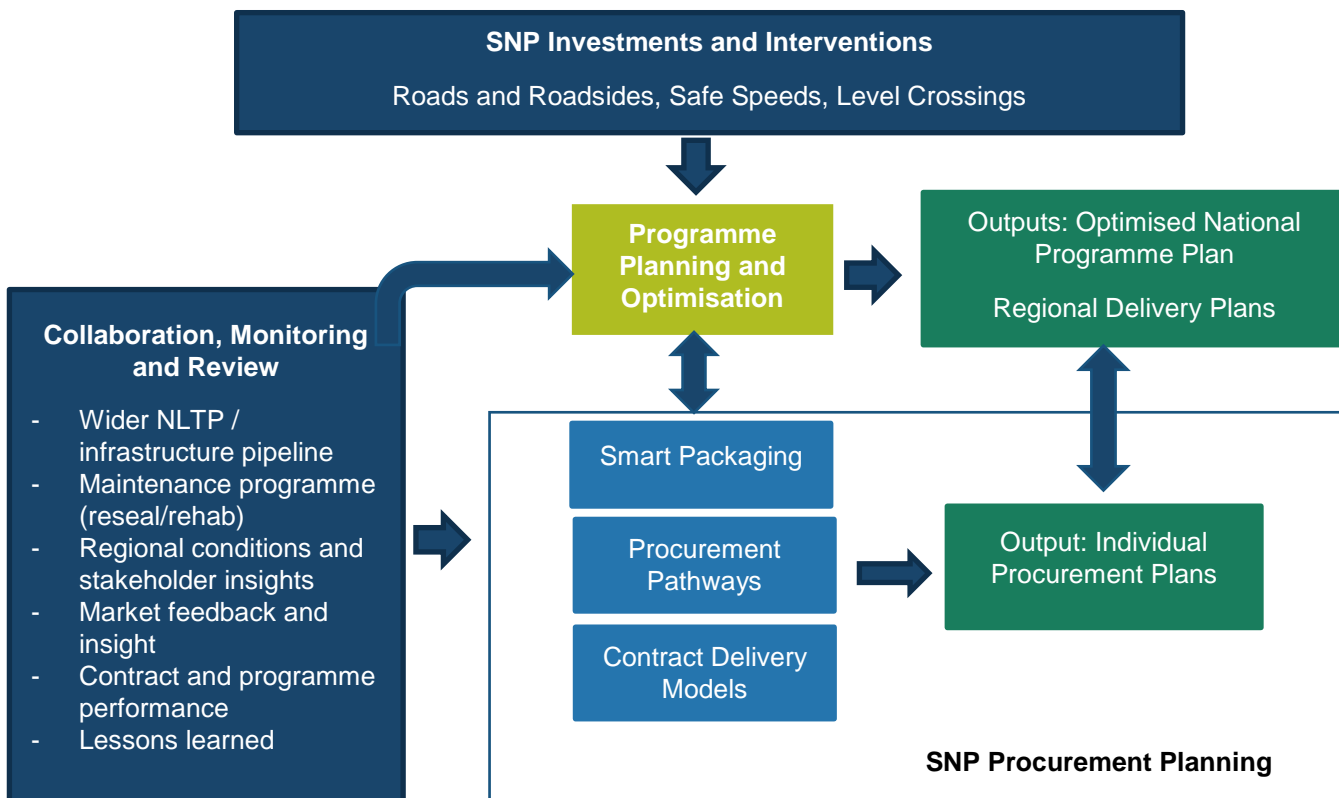
The planning phase of procurement is where many of the strategic decisions are made that ultimately influence the success of the project, and extent of value possible from any contract. This is especially important for physical works, where the majority of funding is spent, risk is highest, and the extent of Client control lowest.

Key decisions are required within the planning phase of procurement, specifically including: the scope of work to package into a procurement activity, the procurement pathway to follow and if necessary, the selection of the contract delivery model (e.g. form of contract) that will provide best value for money, and decisions about the supplier selection method to be used.

The pathways and guidance presented within this section of the Strategy are intended to apply to projects or physical works investment packages valued at \$50m or less. Investments in excess of this level generally require a business case (including a commercial case which should seek to reconcile / align with this framework strategy where relevant).

The below diagram illustrates that planning for physical works procurement will be managed at a programme-level. The SNP's approach to Programme Optimisation will ensure that the physical works requirements from each sub-programme are identified and aligned with each other, (and the wider infrastructure programme), to take consideration of smart packaging options and procurement pathways, which will directly inform regional delivery plans and individual procurement plans.

Approach to SNP Physical Works Procurement Planning



6.3 Physical Works Procurement Pathways

A number of procurement pathways have been identified to meet the objectives of this strategy. These are to be evaluated as part of programme optimisation and procurement planning, alongside Smart Packaging considerations. New pathways may be developed during the life of the SNP, and will be reflected within updates to this framework Strategy.

Some pathways result in the use of an existing contract delivery model and / or the use of direct appointment for supplier selection. For competitive processes or situations where these factors have not been determined – later sections provide guidance on selecting a contract delivery model and supplier selection method.

PW Procurement Pathway	Description:	Appropriate when:	Considerations:
<p>1. Openly advertised competitive tender</p>	<p>Our default approach to sourcing physical works, this allows maximum opportunity for markets, and greater transparency of value through competition. Procurement planning should identify a contract delivery model and a supplier selection method in accordance with the Procurement Manual, our Infrastructure Procurement Strategy and SM021.</p>	<p>Medium to high value of work, (or multiple projects packaged together) in a region or market with healthy levels of competition.</p> <p>We wish to provide a targeted opportunity to promote healthy markets within a region.</p> <p>We have identified the need for a specific contract delivery model.</p>	<p>Lead times for process completion, capacity to manage evaluations.</p> <p>Cost to market of responding.</p> <p>Consider packaging of multiple projects, including mechanisms for performance-based award of future work.</p>
<p>2. Closed Contest (Limited Invitation to Tender) competitive tender</p>	<p>As above, but only a selected number of suppliers are invited to respond to a Request for Tender. Procurement planning should identify a contract delivery model and a supplier selection method in accordance with the Procurement Manual, our Infrastructure Procurement Strategy and SM021</p>	<p>Medium to high value of work, (or multiple projects packaged together)</p> <p>We wish to provide a targeted opportunity to promote healthy markets within a region.</p> <p>Competition is required or desired, within shorter timeframes, or with limited capacity to undertake evaluation.</p> <p>A limited number of prequalified suppliers are available</p>	<p>Lead times for process completion capacity to manage evaluations.</p> <p>Justification of which suppliers to invite to tender.</p> <p>Consider packaging of multiple projects, including mechanisms for performance-based award of future work.</p>
<p>3. Inclusion of requirement within an upcoming (non-SNP) project and / or procurement process</p>	<p>(As with 1&2 above)</p> <p>Add SNP requirement to the scope of work intended to be procured under its own procurement plan.</p> <p>Could either be a Council or Transport Agency delivered project.</p>	<p>Close geographic proximity of works</p> <p>Alignment of timeframes</p> <p>Synergies in the equipment and expertise required</p> <p>Increase in attractiveness of the work, within a combined work package.</p> <p>Suitable contract delivery model has been selected.</p>	<p>Potential process and delivery delays to either project</p> <p>Agreement from project teams.</p> <p>Cost allocation between projects if funding sources differ.</p> <p>Attractiveness of work to the market</p> <p>Delegation levels for the aggregated works</p>

<p>4. Inclusion of requirement within an existing physical works project, through contract variation.</p>	<p>Variation to an existing capital delivery contract to include the SNP requirement. Could either be a Council or Transport Agency project / contract.</p>	<p>Close geographic proximity, existing mobilisation.</p> <p>Alignment of timeframes</p> <p>Existing project and contractor are performing well</p> <p>Synergies in the equipment and expertise required</p>	<p>As above</p> <p>Does not allow for competition, requires justification.</p>
<p>5. Addition of requirement to an existing maintenance or operations contract (e.g. ASM or a Network Outcome Contract)</p>	<p>Transport Agency's AMC and NOC agreements allow for the addition of capital / project works, and some Council operations contracts have the same mechanisms.</p> <p>These allow for small packages of physical works to be performed alongside maintenance activities, utilising existing resource, equipment and subcontractors.</p>	<p>Type of work is well suited to a maintenance provider, who has relevant experience.</p> <p>Size of job or geographic location limits competition. Generally suited to low value works (<\$1m)</p> <p>Efficiencies through aligning works with maintenance activity.</p> <p>Limited need for specialist or extra equipment or subcontractors.</p>	<p>Current performance levels, and track record of contractor in managing additional capital work.</p> <p>Impact on core maintenance work (capacity of contractor).</p> <p>Does not allow for competition, requires justification.</p>
<p>6. Award of work through an existing panel of providers</p>	<p>Utilising national, regional or local panels (of the Transport Agency or Councils) to contest or directly award work in accordance with panel procedures.</p> <p>Transport Agency options include the Northern Delivery Framework.</p>	<p>A suitable panel exists, with suppliers prequalified to the required level.</p> <p>Panel has been tried and tested as suitable for the relevant type / scale of work.</p> <p>Expediency is required (speed of award), potentially with the desire for some competition.</p>	<p>Requirement to follow panel rules for work allocation (potentially including competition)</p> <p>Limits opportunity for new entrants.</p> <p>Contract delivery model may already be prescribed.</p>
<p>7. Direct appointment of a prequalified supplier</p>	<p>Identification and justification of directly engaging a supplier through a single quote / proposal and direct negotiation.</p>	<p>Expediency is required for reasons of safety related urgency (speed of award)</p> <p>Uneconomic to conduct a competitive sourcing process.</p> <p>An absence of competition.</p>	<p>Ability to demonstrate best value for money</p> <p>Perception / reputational risk if used frequently or for high value contracts.</p> <p>Impact to markets.</p>

6.4 Contract Delivery Models

Unless utilising a procurement pathway that provides an existing contract delivery model, our default approach to contracting for low cost low risk, or SSI physical works within the SNP is a Traditional contract delivery model, utilising the Transport Agency's pro-forma version of NZS 3910:2013. Variants to our pro-forma contract should only be considered where there are non-standard requirements, and the SNP should strive to utilise standard and consistent versions of the agreement.

A traditional contract delivery model involves a 'design then construct' approach. Alternatives to this, such as Early Contractor Involvement (ECI), a collaborative contract, (such as an alliance), or a tailored contract delivery model should only be considered in extenuating circumstances, for example: a project >\$50m, where there are significant complexities or risks involved in integrating design and construction. In these cases, SNP will apply the guidance set out within the Contract Procedures Manual (SM021) and the Infrastructure Procurement Strategy when considering alternative delivery models, or any intent to develop a tailored contract delivery model. In all cases, the procurement pathway and contract delivery model, and the justification for selection, must be documented as part of procurement planning and approved by the appropriate delegation holder.

6.5 Staged Approaches to Construction (separable portions)

In the interests of accelerating commencement of physical works, incentivising strong performance of contractors, and enabling collaboration between designers and constructors - SNP will consider breaking single projects into separable portions. Using this approach, a supplier of physical works will be selected for the project prior to the completion of full design, with methodology assessed for the full project but pricing focussed on the first stage of works, Award and commencement of physical works will be in two or more stages, with later portions awarded iteratively as design is completed, and based on the contractor's performance of earlier portions.

This approach should not be used to effectively disaggregate contract requirements, (e.g. for the purposes of lowering delegation thresholds or providing opportunities for firms with a lower prequalification rating). The purpose is to enable early mobilisation of physical works, enabling it to commence concurrently with design, i.e. for design work to completed within stages, allowing for construction contracts to be awarded and physical works to commence on the first stages of the project during completion of design for later portions.

This approach prioritises speed of delivery over certainty of cost. Careful consideration should be given to the supplier selection method, scope of each separable portion, an appropriate pricing mechanism to ensure value within later stages of work and enable reconciliation, and clear performance criteria and management practices that will determine whether the constructor should be awarded later stages of the project (with contingency if they are not). These considerations should be addressed and documented within a procurement plan.

6.6 Supplier Selection Methods

Unless utilising a procurement pathway that involves direct appointment or the application of existing panel procedures, SNP projects must identify an appropriate supplier selection method as part of procurement planning. When doing so, the SNP will utilise one of the following methods:

- Lowest price conforming
- Target price
- Price-quality
- Quality based

The approach taken to choosing a supplier selection method must follow the NZTA guidance as included within the Contract Procedures Manual (SM021) and the Infrastructure Procurement Strategy. The table below provides guidance for the choice of supplier selection method and the non-price attributes to utilise within evaluation.

SNP will utilise existing prequalification processes and seek to apply the minimum number of NPAs that are most relevant to the specific requirement, in order to minimise tendering costs and time periods for the Transport Agency and industry. The below table provides guidance for the choice of a supplier election method and the use of NPAs.

SNP Non-Price attribute selection approach

Prequalification level	Recommended supplier selection methods	Non-price attribute options					Recommended number NPAs
		Relevant experience	Track record	Relevant skills	Resources	Methodology	
A (>\$20M)	PQM	✓	✓	✓	✓	✓	4-5
A	PQM	Optional	Optional	✓	✗	✓	2-3
B/C	LPC / PQM	✗	✗	✓	✗	✓	0-2
D	LPC	✗	✗	✗	✗	✓	0-1

6.7 Future Considerations for Physical Works Procurement

As the shape of the SNP, including the scale of works within the 2021-24 NLTP, becomes clear and the programme advances, SNP and the Enterprise Procurement Team will consider additional sourcing options to achieve programme-wide optimisation and best value for money.

These will specifically include consideration of:

- Establishing one or more new panels of regional contractors, within an overarching framework, potentially regionally or for standardised national requirements
- Bulk purchasing material or supply inputs (such as ATP or Guard Rail)
- Commissioning contractors for early site investigations, and / or ECI
- Establishing a Physical Works Alliance

Progression of any of these options would be subject to engagement with the SNP Steering Team development of a specific Procurement Strategy for approval within delegated authority. Review of this framework strategy may also be required.

6.4.1 New Regional Panels

Panels would be created for each region (where they don't already exist), where there was sufficient planned scope to benefit from a panel arrangement. These panels would operate under an overarching framework which would look to share lessons and provide consistent management practices.

Consideration will be given to the cost and effort (to industry and the Transport Agency) of establishing such a construct, relative to the potential efficiency benefits.

To minimise establishment and bid costs, and improve the viability and attractiveness of joining - SNP and the Procurement team would consider whether the scope of such panels should extend across the wider NLTP and be available to Councils, and would consider a single process covering multiple regions – allowing smaller regional suppliers to join a specific panel and larger suppliers to join the regions in which they have capability (without multiple applications).

6.4.2 Bulk Purchase Contracts / Category Management

The SNP scope contains similar items across a number of projects e.g. ATP and Guard rail. There is an opportunity to bulk purchase these items for economies of scale and free issue to the successful PW supplier, or to establish preferred sources of supply at standard rates applicable to all PW suppliers.

The Transport Agency has experience on similar types of contracts for Speed Cameras and VMS. There may present opportunities to reduce supply constraints or risks, or achieve greater value for money through centralised bulk purchasing, as well as potential benefits through use of consistent materials, including their maintainability. Sensitivities in terms of market competitiveness and viability of suppliers will be taken into account when considering such initiatives.

Challenges such as stores facilities / arrangements, management of oversupply and liability for waste, and financial and insurance arrangements would require careful consideration as well as the sourcing and supply arrangements.

6.4.3 Safe Networks Alliance

This option could involve:

- the creation of a national alliance for Physical Works, or
- modifying the existing Consortia model to include one or more Physical Works providers.

While there are some benefits in a Physical Works Alliance such as opportunity to feedback lessons and continually improve during life of alliance, enabling the programme to react to changes in scope without large variation costs and to provide construction advice early. There are also several negatives including the cost of alliance establishment and overhead, and the likelihood that it could impact markets and prevent opportunities for competition except at a subcontractor level.

7. MANAGING SNP PROCUREMENT

7.1 Overview

Procurement is a critical component of Programme operations. This section provides a description of how management responsibilities should be performed, and key considerations in operating the procurement workstream of the programme. These include:

- Maintenance of a programme pipeline and regional delivery plans
- Actively managing contracts and relationships
- Probity and transparency
- Monitoring, measuring and reporting
- Capturing lessons learnt
- Consistently applying policy and procedures
- Having clearly defined responsibilities

7.2 Pipeline and Regional Delivery Plans

The Transport Agency understands the commercial value to its suppliers of being well informed of current and future procurement activities. This allows suppliers to plan their resource allocations to meet future tender opportunities and improves participation and outcomes from procurement processes for the Transport Agency. We also value the feedback and input that our suppliers give us on our processes, documentation and strategies.

We use multiple channels to communicate and consult with industry partners, including:

- We publish the NLTP procurement pipeline on the Transport Agency's [website](#).
- We use our Supplier Relationship Management channels, including our regular Industry Liaison Meetings and direct supplier meetings
- We periodically conduct regional industry roadshows
- We make use of supplier industry association dissemination and consultation channels (e.g. CCNZ and ACENZ)

SNP will maintain a pipeline of its forward work programme and liaise with the Enterprise Procurement Team and the rest of Transport Services to disseminate this to industry and our investment partners. A programme-level pipeline will allow for the preparation and maintenance of Regional Delivery Plans.

Regional Delivery plans will be prepared and maintained by the SNP, to support delivery planning, smart packaging, industry engagement, collaboration with stakeholders including Councils, and tactical procurement planning.

From a procurement perspective, Regional Delivery plans will include:

- Pipeline of physical works activity for each region
- Intended procurement pathways, including competitive opportunities
- Indicative milestones, including procurement approach and milestones
- Consultation and engagement intentions, including opportunities for collaboration with Councils
- Points of contact for each procurement activity

7.3 Active Management of Contracts and Relationships

The active monitoring and management of our contracts, supplier relationships and procurement strategies are critical to achieving our Strategic Objectives and ensuring the planned benefits are realised.

Active contract management and monitoring for Safe Networks Programme will have a particular focus on:

- Meeting performance standards, especially safety, quality and timeframes
- Cost control and management of variations and change
- Benchmarking between contracts and capturing insights to inform future planning and optimisation
- Relationships, including between the supplier and the Transport Agency and the supplier and the Transport Agency's partners and stakeholders
- Dependencies, both on and between suppliers

Formal supplier performance evaluations - The Transport Agency has a formal system in place to evaluate and record supplier performance (Performance Assessment by Coordinated Evaluations, PACE). This system both facilitates ongoing performance monitoring during the life of the contract and incentivises good performance by providing an objective performance history that can be taken into account in future sourcing processes. SNP will utilise PACE to assess and record supplier performance, for professional service and physical works contracts.

7.4 Probity and Transparency

SNP will apply relevant guidance and procedure in the management of probity matters. This includes the use of an independent probity advisor to provide assurance and advice in respect of complex and high value procurement activity, or to review standing high-value arrangements such as supplier panels or consortia contracts.

Conflict of Interest declarations will be sought from employees, consultants and contractors involved in procurement planning and decision making, with support from Risk and Assurance in respect of any real or perceived conflicts that are declared.

SNP will ensure that appropriate records are maintained in support of procurement and contract decisions, and that procedural steps for proactively publishing information are consistently applied (including contact award notifications),

7.5 Monitoring, Measuring and Reporting

Specific measures and targets will be developed at a programme level in support of this strategy and its objectives. SNP will aggregate project level information and track and report against procurement related measures at a programme level: The Procurement Lead is responsible for the development of specific measures and consistently applying these to demonstrate performance against this framework strategy. Measures and reporting components for SNP may include:

- Achievement of agreed Sourcing milestones within programme (approval of plans, release of tenders, award of contract)
- Number, and profile, of respondents to competitive tender processes
- Actual (paid) contract price vs agreed contract price vs estimate vs budget
- Underlying rates applicable to professional services engagements
- Individual contract performance, and aggregated supplier performance
- Consortia / panel utilisation and work allocation
- Supplier achievement of contractually agreed milestones
- Key procurement risks or issues requiring tracking or action at a programme or Steering Team level
- Health and Safety incidents incurred within delivery of SNP contracts
- Initiatives commenced and benefits realised in support of Broader, Social, Outcomes
- Supplier / market generated feedback in respect of SNP procurement
- Conflicts of interest declared, and any probity issues
- Audit issues / actions identified in respect of SNP procurement
- Lessons and learnings identified through the procurement lifecycle

7.6 Application of Policy and Procedure Manuals

In managing its procurement activity, the SNP will consistently apply all relevant procurement related standards and procedures. This specifically includes:

- Procurement Policy, including the Principles of Government Procurement
- Delegations Framework
- Health and Safety Expectations
- NZ Transport Agency Procurement Manual
- Conflicts of Interest Policy
- The SM0 suite of procedure manuals and pro-formas

Any intention to depart from Transport Agency standards, including procedure manuals, should be identified as early as possible to enable the required endorsements and approvals to be sought.

Transport Agency delegations are under review (as of Q1 2020). As discussed earlier in this strategy, SNP should carefully monitor and assess the efficient application of delegated authority and associated workflows, so as to inform any necessary improvements or changes at a programme level.

7.7 Procurement Responsibilities

In accordance with the internal Procurement Policy, and the SNP Programme Management Plan, the following accountabilities and responsibilities apply to procurement activity managed by the SNP. More detailed descriptions of responsibilities are set out within those documents.

Minor changes to roles and responsibilities described below will not necessitate an update of this Strategy, but must be approved by both the Senior Manager Procurement, and the Senior Manager Project Delivery.

Accountability: The General Manager for Transport Services is accountable for the planning, management and outcomes of all procurement activity within the SNP, as well as the risks, benefits and overall performance of SNP contracts.

Procurement Sponsor: Procurement Sponsors are responsible to the General Manager for the conduct and outcome of sourcing processes, including making best value for money judgements or recommendations on behalf of the Transport Agency.

The role of Procurement Sponsor is typically determined in accordance with our Delegations Framework, however for practical purposes within the SNP, the Portfolio Manager will assume these responsibilities – and utilise the Delegations Framework for formal contract decisions and approvals exceeding a Portfolio Manager's delegation.

Contract Owner: Each contract entered into by the SNP must have a designated Contract Owner. Contract Owners must be an employee of the Transport Agency and are responsible for the overall conduct and outcome of the relevant contract. Specific responsibilities are described within our Procurement Policy.

The SNP Portfolio Manager is required to ensure that all SNP contracts are assigned to an appropriate Contract Owner, or for fulfilling these responsibilities directly. (note: contract management responsibilities on behalf of a Contract Owner can be delegated and performed by 3rd parties).

Programme Governance / Steering Team: In support of the SNP investment objectives, Transport Services have established a specialist Programme Team with dedicated resourcing and governance structure, including a Programme Steering Team.

In a procurement context, the SNP Steering Team is responsible for supporting the SNP Portfolio Manager to implement this Strategy, fulfil the above responsibilities, and provide assurance to the General Manager.

The Safer Networks Programme Management Plan, and / or individual procurement plans (including those for the management of Consortia or Panels) may assign more specific responsibilities or authority to the Steering Team.

Centre of Excellence:

Under the Senior Manager Procurement, the Procurement Centre of Excellence (Enterprise Procurement Team) within Corporate Support is responsible for the overall performance of the Transport Agency's procurement function – including providing access to expert procurement and commercial advice.

In support of the SNP, the Enterprise Procurement Team (EPT) will:

- Provide a senior representative to serve on the SNP Steering Team or equivalent governance group
- Support (or manage) the engagement and technical supervision of 3rd parties undertaking procurement work for the programme
- Provide routine advice and support in application of procedure manuals, policies and procurement standards
- Promptly and efficiently exercise procurement related delegations
- Lead formal industry engagement / communication activities, aligned to the wider infrastructure programme
- Either provide (or support recruitment and management) of a Procurement Lead for SNP
- Support the review and maintenance of this Strategy.

Procurement Lead

The SNP Portfolio Manager and the EPT will agree on the appointment of a Procurement Lead for the SNP. Noting the scale, complexity and ongoing value of SNP procurement – this role is a critical enabler of success.

The Procurement Lead may report to either the Portfolio Manager or the EPT and will be responsible for alignment and coordination between the SNP and the Centre of Excellence and for supporting the Portfolio Manager and the Senior Manager Procurement in fulfilling their respective responsibilities. The Procurement Lead's activities will include:

- Promoting and leading the consistent application of this Strategy
- Coordinating and contributing to procurement elements of programme optimisation

- Maintaining a consolidated pipeline of SNP procurement intentions, and ensuring alignment with the wider infrastructure programme's procurement pipeline
- Technical oversight of 3rd parties undertaking procurement work for the programme
- Monitoring of procurement activity and outputs, to ensure consistent application of procurement policy and procedure manuals
- Engagement and management of independent probity assurance services
- Monitoring and reporting against procurement objectives and risks for the SNP
- Directing and centrally monitoring supplier performance management, including the performance of panel and consortia arrangements
- Supporting supplier-relationship management / industry engagement activities
- Iterative review of key procurement documentation / outputs, to ensure consistency of practice and efficient decision making
- Coordinating and supporting the activities of Tender Secretaries in support of the SNP
- Capturing and applying lessons learnt through the programme

While preferably a permanent employee of the Transport Agency, the Procurement Lead may be resourced by a third-party contractor provided that this is fully independent of any professional services or consultancy firm undertaking other work in support of the SNP, and that appointment is subject to careful assessment of (real or perceived) conflicts of interest.

The extent of responsibilities, and scale of the SNP may result in the need for multiple resources to fulfil the function of Procurement Lead. The Senior Manager Procurement and the SNP Portfolio Manager will collaborate to assess the effectiveness of this construct and resourcing requirements.