

Auckland Road Safety Programme Business Case

Auckland Transport

August 2019

Final

Programme Business Case



**Auckland
Transport**
An Auckland Council Organisation



Approval

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GLOSSARY OF TERMS

| Abbreviation / Term | Explanation |
|---------------------|---|
| PBC | Programme Business Case (this document) |
| DBC | Detailed Business Case |
| AT | Auckland Transport – Investment Owner |
| NZTA | New Zealand Transport Agency – Partner and co-funder |
| AC | Auckland Council – Investment Partner |
| MoT | Ministry of Transport – Investment Partner |
| ACC | Accident Compensation Corporation - Partner |
| Police | New Zealand Police Commission – Investment Partner |
| DHB | District Health Boards – combined DHB’s are investment partners |
| AA | Automobile Association |
| DSI | Road Deaths and Serious Injuries |
| KPI | Key Performance Indicator |
| GPS | Government Policy Statement (usually on Transport, 2018) |
| IAF | Investment Assessment Framework (NZTA, 2018) |
| ILM | Investment Logic Map, key component of Strategic Case including problems, benefits and investment objectives. |

EXECUTIVE SUMMARY

The purpose of this Programme Business Case (PBC) is to develop the 10-year programme for Road Safety for the Auckland Transport Network. The geographical area of this PBC covers Auckland Transport's road network, but also considers the wider Auckland context. As such the PBC does not seek investment in the state highway network which is under the jurisdiction of the New Zealand Transport Agency (NZTA) but does consider wider legislation, education and enforcement across all roads and transport facilities, including state highways.

The Road Safety PBC builds on the Auckland Transport Road Safety – Three Year Programme Review, which was completed in December 2018. The Three-Year Programme is the first stage of the 10-year programme proposed within this business case.

Strategic context

Auckland has a road safety problem. A 2018 Business Improvement Review¹ stated:

- that the “road safety performance in Auckland in recent years, particularly since 2014, has been most concerning”; and
- that “Auckland is experiencing what could legitimately be described as a crisis in road safety performance”.

The 2015/2018 Strategic Road Safety Case outlines the strategic context for the 2015/18 Auckland road safety investment proposal and case for change. It develops a case to deliver against RoadSafe Auckland's (Auckland Transport, NZ Police, NZ Transport Agency) commitments to Safe Roads & Roadsides, Safe Speeds and Safe Road Users on the Auckland transport network.

The 2018 BIR and 2015/18 Strategic Case recommend a clear need to invest in road safety, concluding that:

- All road deaths and serious injuries (DSI) are considered unacceptable (Vision Zero);
- Auckland's current road deaths are at unacceptably high levels;
- The historic amount of investment and leadership around road safety was not significant enough to turn around the trend of increasing DSI;
- There is currently unclear direction on how and where to invest more in road safety in Auckland;
- A strong strategy, aiming for zero road deaths, and a robust programme for investment will be critical to ensure AT and its partners can make Auckland's roads safer.

As a result of those recommendations, a Programme Business Case (PBC) was commissioned in April 2018. The PBC commenced with a review of the short-term road safety programme and the main problems around road safety in general. The data analysis and engagement with stakeholders concluded that the level of DSI are unacceptable and will only get worse. In fact, DSI increased by 70% in that period, a much higher increase than the rest of NZ (30%) and a much higher than the increase in population or travel.

¹ Auckland Transport: Road Safety Business Improvement Review, November 2017-January 2018; Whiting Moyne P/L

In the period 2013-2017, 2,355 crashes that resulted in deaths or serious injuries were recorded on the Auckland Transport controlled network. These 2,355 crashes resulted in 2,607 DSI. In the Auckland Region, including State Highways, there were 3,066 DSI in this period. It is of concern to Auckland Transport that the number of reported DSI in Auckland has increased by 70% since 2012, compared to a 30% increase across New Zealand.

A detailed analysis of the crash history is presented in Appendix A, and highlights the following key observations:

- In the 5-year period from 2013 to 2017 there were 2355 fatal or serious crashes in the AT controlled network, resulting in 2607 DSI;
- DSI increased by 70% in that period, a much higher increase than the rest of NZ (30%) and a much higher than the increase in population or travel;
- Motorcyclists, cyclists and pedestrians were significantly over-represented in the DSI, reflecting the higher vulnerability of these users;
- 51% of the fatal and serious crashes occur on 13% of the roads;
- 25% of the intersection crashes occur within the top 2% of the intersections on the network
- The majority of DSI are generated on the urban 50 kph arterial;
- There is a proven link between speed and severity of crashes. There are a significant number of roads in Auckland where vehicle speed is higher than safe or appropriate speeds, suggesting either these roads should be improved, or the speeds should be reduced.

This evidence and strategic drivers were analysed and workshopped with stakeholders to document the confirmed problems, investment benefits, and measures for the programme. These were subsequently developed into investment objectives as follows. Further detailed performance measures are outlined in section 11.

| Problems | Benefits | Investment Objectives of the programme |
|---|--|--|
| Problem one: Insufficient leadership and priority for road safety in policy and decision making has prevented the full delivery of a safe system | Benefit one: Sustained reduction in road deaths and serious injuries | 1. Reducing road deaths and serious injuries by 60% from 690 in 2017 to no more than 276 by 2028. |
| Problem two: Unsafe roadside and street design increases speeds, the impact of small mistakes, and discourages healthy transport choices | Benefit two: Safe and healthy streets for everyone | 2. Safe and Healthy streets for everyone evidenced by increasing PT and active mode use from 16% (Journey to work mode share 2013) to at least 21% by 2028. |
| | | 3. Safe and Healthy Streets for everyone by improving health, emissions and social outcomes (measure and baseline to be developed). |
| | | 4. A safe roadside and street environment by increasing the proportion of vehicles surveyed travelling within posted speed limits from XX% to XX% by 2028. Baseline to be established. |
| | | 5. A safe roadside and street environment by increasing the proportion of the road |

| | | |
|---|--|---|
| | <p>Benefit three: A safe roadside and street environment</p> | <p>network where speed limits are adjusted to align with Safe & Appropriate Speeds from 29% to 60%. (baseline and targets to be confirmed).</p> <p>6. 20% of rural VKT are on roads that provide safe system primary and supporting treatments (e.g three barrier system) by 2028*.</p> <p>7. Improved safety of infrastructure for vulnerable road users in urban areas such that there is an increase in the proportion of VRU trips that use safe routes (e.g. protected cycle facilities, see Performance Measures, Chapter 11)</p> <p>8. Community perceptions of streets, footpaths, pedestrian crossings, cycle facilities and end-to-end public transport as a safe environment for active modes is increased (measured by customer perception survey – baseline to be developed).</p> |
| <p>Problem three: Risky road user behaviour, insufficient enforcement, and (poor) understanding of the road safety problem, have contributed to the increase in death and serious injuries</p> | <p>Benefit four: Safe road user behaviour</p> | <p>9. Sustained increase in proportion of drivers detected as:</p> <ul style="list-style-type: none"> • Being within the legal Blood Alcohol Content (BAC) level; • Not using a cellphone while driving; and • Being appropriately licenced. (baselines and targets to be confirmed with NZ Police) <p>10. Community and Tamaki Makaurau Governance Group staff are aware, understand and support the Vision Zero approach including speed management. (measured by perception surveys – baseline to be developed).</p> |

**Primary treatments are those that have the potential to achieve the Safe System objectives of near-zero deaths and serious injuries. Supporting treatments (Turner et al. 2009) reduce the likelihood of a crash, but do not fully reduce the consequence or severity of a crash should one occur (Austroads Research Report AP-R509-16, Safe System Assessment Framework, February 2016).*

Stakeholders have been involved throughout the process either through workshops or meetings in terms of the problem and benefit development but also the programme development. As a result of the programme development, several alternatives were identified including:

- Leadership, Capability and Policy Change
- Interventions to manage demand
- Interventions to increase productivity
- Interventions to improve supply
- Enforcement
- Education and Engagement

At this time, it was also decided that the Programme Business Case for Auckland Road Safety would focus on specifically Safety Capex investment. There is also significant investment that Auckland Transport makes in Maintenance and Other Capital projects (outside of Safety-specific investment in these areas), and this other investment will also deliver safety benefits, but this is not detailed in the programme business case.

The alternatives were developed into intervention categories and levels, towards the development of 11 programmes. These programmes were developed through team and stakeholder workshop. Programmes included:

- P1 – 3-year programme extended to 10 years
- P2 – Focus on high risk areas and highly effective measures
- P3 – Contribute as much as possible to Vision Zero
- P4 – Focus on Speed Management
- P5 – Focus on Transformational Infrastructure
- P6 – Focus on Vulnerable Road Users
- P7 – Targeting 60% DSI Reduction
- P4B – Focus on Speed Management Version B
- P9 – Speed Management with some infrastructure
- P10 – Focus on Speed Management and vulnerable road users
- P7B – Targeting 60% DSI reduction within current budget

The Programmes were assessed using a multi-criteria analysis (MCA) including alignment to the investment benefits, risks and effects. Programme outcomes were also estimated, including forecast reduction in DSI, cost, and economic efficiency. After examining the range of programme analysis, three programmes were shortlisted:

- P3 – Contribute as much as possible to Vision Zero
- P10 – Focus on Speed Management and vulnerable road users
- P7B – Targeting 60% DSI reduction within current budget

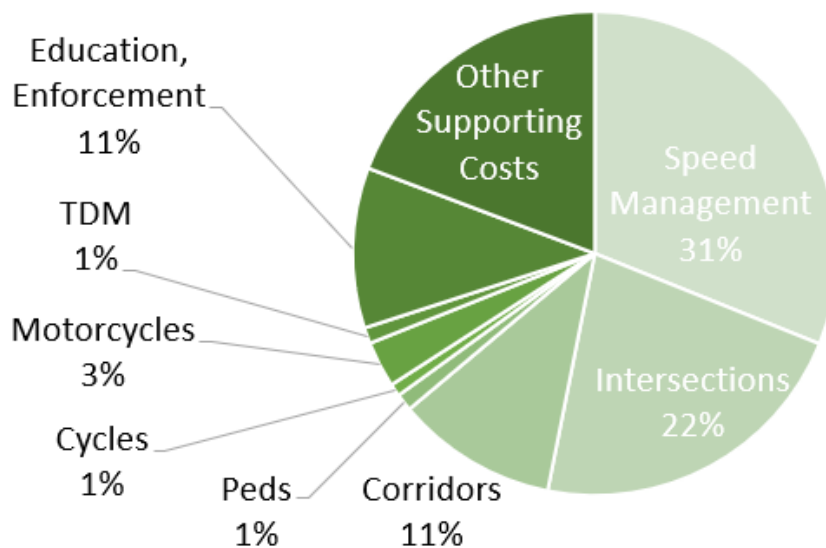
As a result of the assessment and stakeholders workshop, Programme 7B was identified as the recommended programme as it meets the investment objectives, contains a combination of investment in infrastructure and non-infrastructure responses to the problem of increased DSI on Auckland's road, and is affordable within the current CAPEX budget for the next 10 years.

Preferred programme

The following components, level of investment and outputs will be achieved for each component:

| Component | Investment | Output |
|-------------------------------|------------|---|
| Speed Management | \$193M | 1,900 km including 1,100 Km urban Local Area Traffic Management (LATM) and 220km rural engineering |
| High Risk Intersections | \$120M | 60 intersections |
| High Risk Corridors | \$68M | Transforms 34km |
| Vulnerable Road Users and TDM | \$35M | Targeted pedestrian, cyclist and motorcyclist infrastructure |
| Enforcement | \$45M | Additional road policing (approx. 20 additional FTE) and technology (speed and red light cameras) |
| Education | \$22M | Co-ordinated education and awareness campaigns |
| Policy | \$8.5M | AT's share of co-ordinated policy and regulatory interventions along with its road safety partner organisations |
| Other Supporting Costs | \$113M | Includes some capex (land acquisition, design & engineering fees) and some opex (monitoring the programme, maintenance) |

Preferred Programme Cost Split



Financial impact

The expected (midpoint) total cost of the Preferred Programme is \$604M (over years 4-10 of the RLTP), an average expenditure per year of \$86M.

The total indicative cost of the programme over the 2018-28 period is \$604M package made up of \$457M of infrastructure improvements supported by \$147M of operational and maintenance costs.

These are midrange “expected” costs, with the forecast range of total costs between \$460M and \$750M. The capital expenditure portion of the recommended programme has been refined to fit within the Auckland Transport RLTP 2018-2027 budget expenditure for road safety, so the affordability of the capital expenditure is assumed to be acceptable.

Economic benefits

The programme is assessed as having a medium economic efficiency, based on an expected BCR of 4.5 within a range of 2.8 to 5.3.

Substantial additional benefits in terms of mode shift and wider health benefits, and potential dis-benefits in terms of effects on vehicle travel times are expected to arise from this programme as discussed in section 8.4. These have not been included within the reported BCR.

The case for change

The Results Alignment for Auckland’s Road Safety Programme is estimated to be Very High, as it not only addresses high risk sites and corridors but also aims to achieve a significant target for reduction in DSI set by the GPS and related strategies.

Urgency/importance of problems

Auckland’s Road safety problem is substantial and solving it is urgent, with the number of DSI on Auckland’s roads climbing 70% from 400 in 2014 to 690 in 2017. If the number of DSI were to remain at 2017 levels over the next 10 years, nearly 7,000 people would be killed or seriously injured.

A delay of two years in beginning the implementation of the road safety programme could result in an additional 900 DSI occurring on Auckland’s roads over the next 10 years.

Outcomes and Benefits achieved by the recommended programme

The recommended programme will:

- Likely reduce the annual number of DSI on Auckland’s roads by 63% compared to the 2017 total to 257 annually by 2028, preventing over 1,760 DSI over the next 10 years.
- Deliver ongoing and long-term benefits in terms of reduction in DSI. Over the next 40 years, the programme could prevent over 10,000 DSI on Auckland roads.
- Upgrade 1900km of road with speed management treatments.
- Transform 60 high risk intersections and 34 km of high risk corridors.
- provide mode shift to active modes and public transport, including reduced congestion and wider health benefits from increased activity, reduced emissions.

INTRODUCTION AND PURPOSE

The purpose of this Programme Business Case (PBC) is to develop the 10-year programme for Road Safety for the Auckland Transport Network. Part A of the PBC will:

- Define the strategic context, including constraints and challenges which impact on road safety and outline why investment in AT's road network is necessary to improve road safety
- Describe the evidence base for investment
- Summarise the problems, benefits of treating the problems and the investment objectives
- Identify what is needed to be addressed as result of the proven problems, and
- List assumptions and uncertainties as part of the decision-making process, prior to the development of the programmes.

The geographical area of this PBC covers Auckland Transport's road network, but also considers the wider Auckland context. As such the PBC does not seek investment in the state highway network which is under the jurisdiction of the New Zealand Transport Agency (NZTA) but does consider wider legislation, education and enforcement across all roads and transport facilities, including state highways.

The Road Safety PBC builds on the Auckland Transport Road Safety – Three Year Programme Review, which was completed in December 2018. The Three-Year Programme is the first stage of the 10-year programme proposed within this business case.



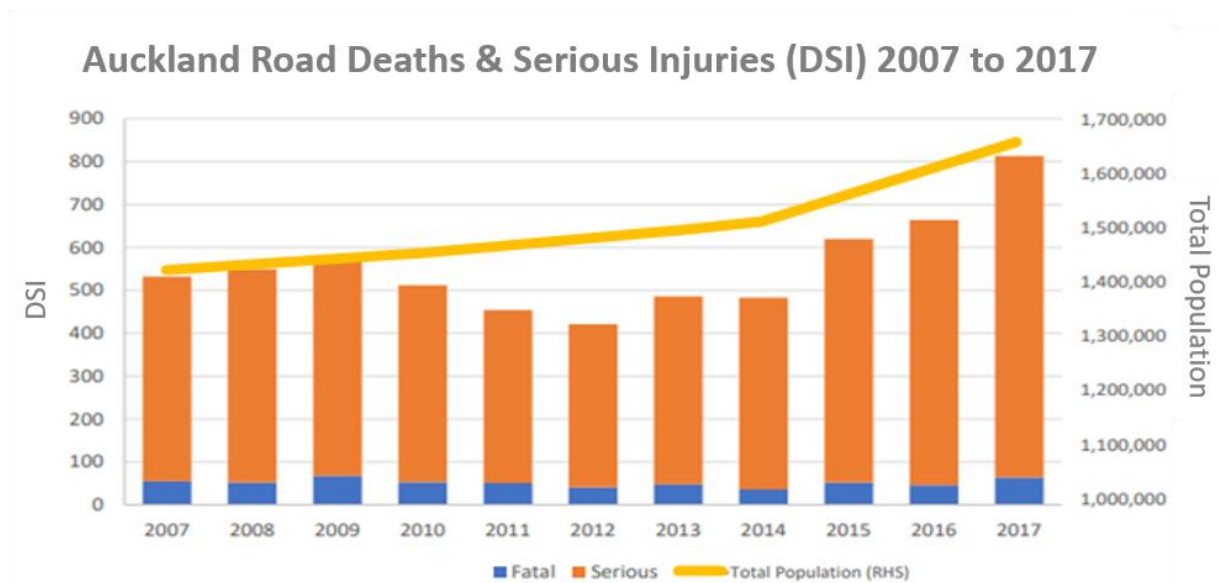
PART A – THE STRATEGIC CASE

1 BACKGROUND

Auckland has a road safety problem. A recent Business Improvement Review (BIR)² stated:

- that the “road safety performance in Auckland in recent years, particularly since 2014, has been most concerning”; and
- that “Auckland is experiencing what could legitimately be described as a crisis in road safety performance”.

Since 2017, Auckland has experienced an increasing trend in high severity crashes. More recently, from 2014-2017, there has been a 70% increase in annual road death and serious injuries (DSI), which was significantly over represented when compared to the rest of New Zealand at 30%. In 2017 alone, there were 64 deaths and 749 serious injuries on Auckland’s roads (including State Highways), with a social cost estimated at \$1.3 billion. Of those 85% (690) of the DSIs were on Auckland Transport’s local road network.



Source: NZ Transport Agency Crash Analysis System

Figure 1-1: 2007-2017 Auckland Region DSI and Population (including State Highways)

Although Auckland Transport (AT) have been delivering an established road safety programme since its establishment in 2010, the BIR highlighted that much more could be undertaken to improve safety. This is of concern given the rising population and associated traffic growth and travel occurring in Auckland. The BIR identified that AT has an important but limited direct road safety delivery responsibility, a limited knowledge of Safe Systems across the organisation and that road safety tended to be a small, “necessary add-on” to AT’s core activity rather than a driving force. Most of which would require a culture shift and substantial change management.

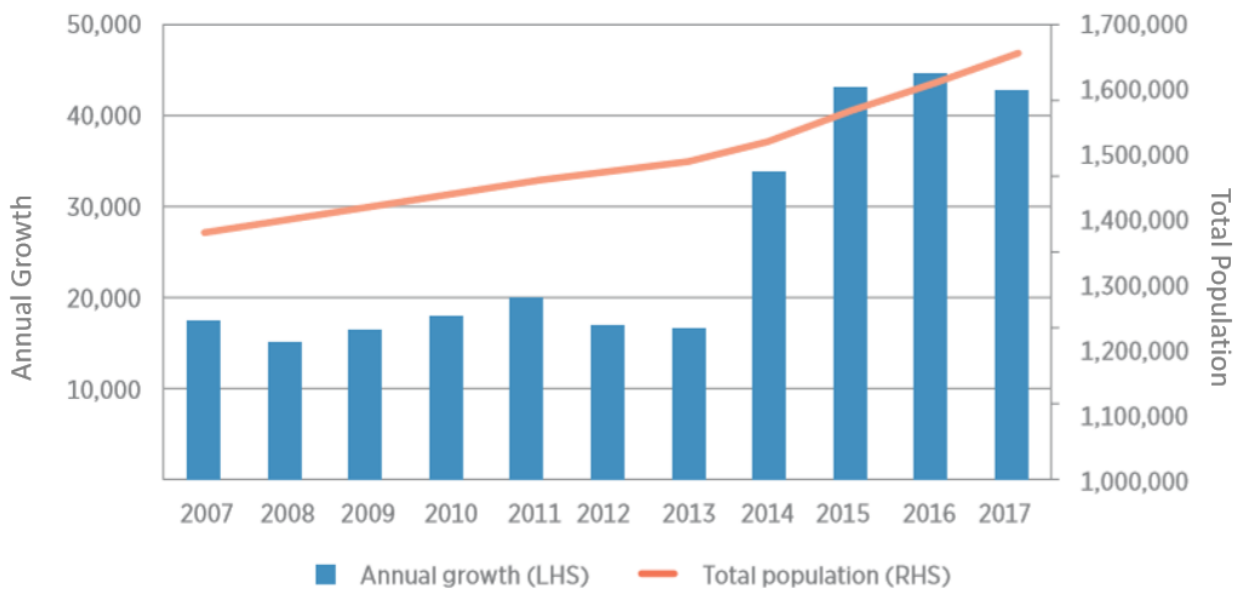
² Auckland Transport: Road Safety Business Improvement Review, November 2017-January 2018; Whiting Moyes P/L

2 STRATEGIC CONTEXT

2.1 POPULATION GROWTH

Auckland is the largest urban area in New Zealand, and home to almost 1.7 million people. Over the past few years, the rate of population growth has increased substantially, from around 17,000 people each year from 2006 to 2013 to over 40,000 since 2015 (about 2.5% per year), making Auckland the fastest growing major city in Australasia (Figure 2-1).

Over the next 25 years, Auckland population is expected to increase by more than the rest of New Zealand's population growth combined, to reach 2.3 million by 2043. Over the 10 years covered by this PBC, Auckland is expected to grow by an additional 300,000 people.



Based on data from Statistics NZ, Subnational population estimates: June 2017

Figure 2-1: Auckland's Population Growth 2007-2017 (Source: Regional Land Transport Plan 2018-2018, Auckland Transport)

To support the vision for delivering road safety in Auckland, Auckland Transport needs to ensure that the transport system is fit for purpose. That means providing safe facilities and transport choices to all road users.

2.2 GROWTH IN TRAVEL DEMAND

Rapid population growth, a buoyant economy and increases in car ownership have led to substantial growth in vehicle travel demand. Vehicle kilometres travelled (vkt) in Auckland have increased by 13% (over 3% per annum) over the past four years, up from 12.6 billion kilometres in the year to June 2013 to 14.2 billion kilometres in the year to June 2016 (Figure 2-2). Notably, over the last 3 years, Auckland vkt has increased at a higher rate than population increases – suggesting population growth is not the sole driver for increased vehicle travel.

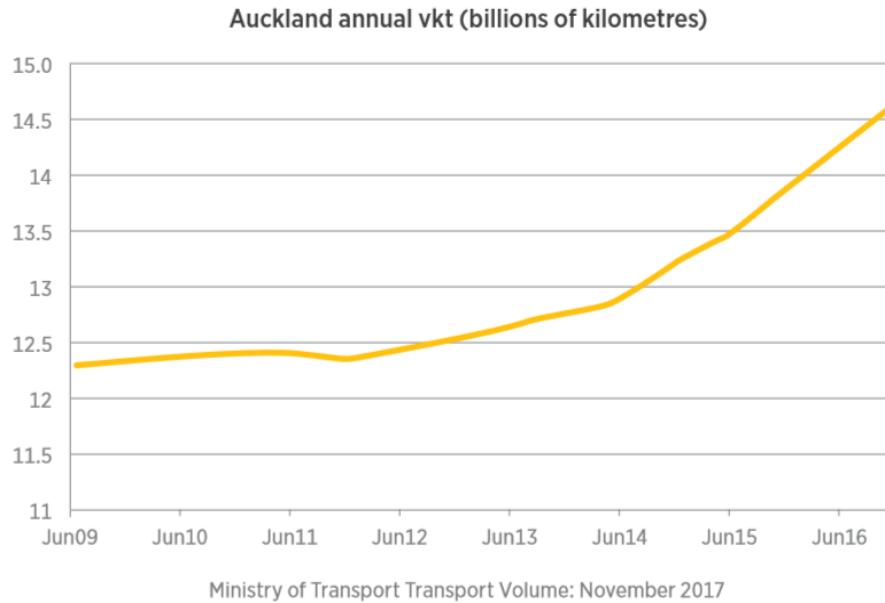


Figure 2-2: Auckland’s Annual Vehicle Km Travelled 2009-2016 (Source: Regional Land Transport Plan 2018-2018, Auckland Transport)

2.3 TRANSPORT MODES

Between 2015 and 2017, most Aucklanders used their private vehicle either as a driver or a passenger to complete their trips, covering 89% of the total distance travelled, according to the household travel survey. Table 2-1 shows the rolling average trips by mode from 2015-2017. This dataset indicates both a dominance of the car in Auckland and an opportunity for change given the projected increase in population in the coming decades.

Table 2-1: Auckland Travel Mode Share - Household Travel Survey 2015-2017³

| Mode of travel | Mode share of distance | Mode share of trip legs |
|------------------------------------|------------------------|-------------------------|
| Private vehicle | 89% | 80% |
| Pedestrian | 2% | 14% |
| Cyclist | 1% | 1% |
| Public Transport (bus/train/ferry) | 5% | 4% |
| Motorcyclist | <1% | <1% |
| Other household travel | Not available | <1% |

Auckland’s increase in population, changing demographics, housing density and diversity as well as new household composition patterns are influencing preferences of transportation options. These physical as well as technological changes are altering the geography of economic opportunity and mobility demands.

³ Note: these findings were based on a sample of the Auckland population. Motorcyclists appear to be under-represented.

Road Transport

Auckland's Road Network comprises State Highways (including the motorway network), managed by the NZ Transport Agency, and 7,420 km of arterial and local roads (including about 840 km of unsealed roads) managed by Auckland Transport. Auckland Transport uses the One Network Road Classification (ONRC)⁴ framework to help manage the network. By road length, 18% of Auckland's road network is classified as Regional and Arterial Roads, 42% are collector roads and the remaining 40% are access and low volume roads. However, the Regional and Arterial Roads carry about 73% of the vehicle travel, with 24% on the collector network and just 3% on the access and low volume roads (Figure 2-3).

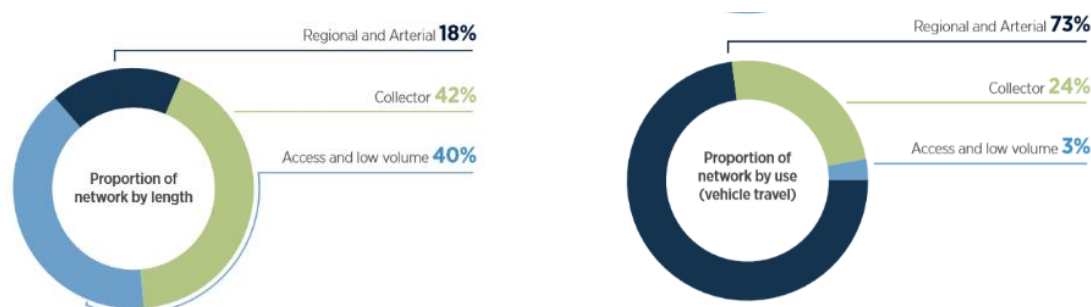


Figure 2-3: Length and Vehicle Travel on Auckland Local Roads by ONRC Class (Source: Asset Management Plan 2018, Auckland Transport)

Cycling

Although only showing a small mode share in the Household travel survey, the number of Aucklanders cycling regularly has increased over the last few years in response to rising congestion, increased petrol and parking charges, the availability and reduced costs of electric bicycles, bike sharing and the provision of more dedicated cycling infrastructure. Data from six permanent cycle counters in Auckland shows a wide variation in the change in cycling numbers between 2011 and 2016, with a weighted average of 51% (10% per annum) increase over all these sites in this period (Table 2-2).

Table 2-2: Cycle Counts 2011-2016 (Source: Auckland Cycling PBC, Auckland Transport)

| Cycle Counter | 2011 | 2016 | Percent change |
|------------------------|----------------|----------------|----------------|
| Great South Rd | 31,807 | 31,469 | -1% |
| Highbrook Dr | 14,277 | 13,026 | -9% |
| Lake Rd | 95,883 | 101,326 | 6% |
| NW Cycleway Kingsland | 112,358 | 240,463 | 114% |
| NW Cycleway Te Atatu | 130,634 | 183,239 | 40% |
| Orewa | 60,319 | 116,439 | 93% |
| Twin Streams | 31,450 | 41,664 | 32% |
| Upper Harbour | 41,513 | 56,090 | 35% |
| Total all sites | 518,241 | 783,716 | 51% |

⁴ <https://www.nzta.govt.nz/assets/Road-Efficiency-Group-2/docs/NZTA160801-The-ONRC-Performance-Measures-Final-Published.pdf>

Public Transport

Annual public transport boardings have increased by 31 percent (nearly 8% per annum), from 69.7 million in the year to December 2013 to 91.1 million in the year to December 2017. Rail has been a big component of that growth, with boardings increasing by over 92 percent since 2013, on the back of initiatives such as a new fleet of electric trains. Bus patronage has also increased, by 20 percent (5% per annum) from 53.9 million in the year to December 2013 to 64.6 million in the year to December 2017 (Figure 2-4).

The increase in public transport use could be expected to have positive effect on road safety as travel on public transport modes is considerably safer than using private modes. On the other hand, increased use of public transport generates new walking (and other modes) trips to and from stops and stations, potentially increasing exposure of vulnerable road users in these areas, many of which are located on busy arterial roads.

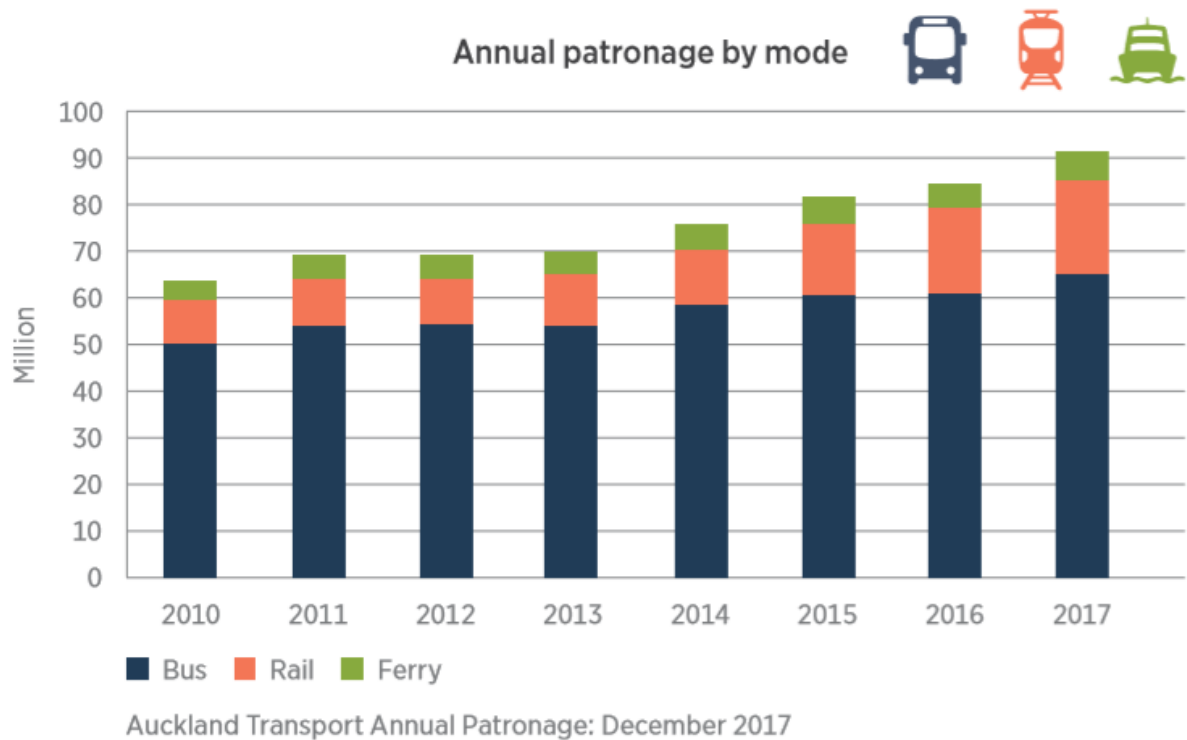


Figure 2-4: Auckland’s Public Transport Annual Patronage 2010-2017 (Source: Regional Land Transport Plan 2018-2018, Auckland Transport)

3 STRATEGIC DRIVERS

There are various strategies which set the objectives for where and how the Government, through the NZ Transport Agency will invest in the transport network. The relevant documents are discussed in the following sections.

3.1 GOVERNMENT POLICY STATEMENT ON LAND TRANSPORT 2018/19 - 2027/28

The Government Policy Statement on Land Transport (GPS) outlines the Government's strategy to guide land transport investment over the next decade (until 2028), provides the strategic direction for land transport within New Zealand and influences the priorities for the National Land Transport Fund (NLTF).

In adopting the GPS, the Government has confirmed the four strategic priorities for the land transport system over this period, which requires both regional and national land transport providers to prioritise activities that contribute to:

- A safe system, free of death and serious injury
- A system that provides increased access to economic and social opportunities, enables transport choice and access, and is resilient.
- A system that reduces greenhouse gas emissions, as well as adverse effects on the local environment and public health.
- A system that delivers the right infrastructure and services to the right level at the best cost.

As part of meeting the GPS requirements for creating a safe transport system, Vision Zero is adopted as the road safety goal.

3.2 VISION ZERO

Vision Zero is a philosophy that states that no DSI are acceptable on our roads and embraces a transformative mindset and ethical approach to making all roads safe. The Vision Zero approach takes imperfect human behaviour into account, and responsibility for road trauma is shared among the users and the designers of the system. Transport system designers have ultimate responsibility for designing and operating the level of safety in the transport system. The transport system is designed to be forgiving and protect road users when human error inevitably occurs. Road users continue to be under obligation to show respect, good judgement and follow the road rules. But, if injury still occurs because of a lack of knowledge, acceptance or ability then system designers must take further action to prevent people being killed or seriously injured.

Vision Zero builds on the Safe System approach to road safety by managing vehicle impact speeds to survivable levels for all road users. The Safe System approach (Safe Speeds, Safe Roads, Safe Vehicles, Safe Road Users) is a holistic view that requires people to think about the road system in its entirety, from infrastructure projects to policy and regulation. It means understanding how "upstream factors" such as design guidelines, public participation, policy, and vehicle regulations all influence transport injuries and deaths.

The new road safety paradigm created by adopting Vision Zero for New Zealand requires a change in the way we lead, plan and deliver road safety. The draft 'Road to Zero' National Road Safety Strategy to 2030 outlines New Zealand's intended approach.

<https://www.transport.govt.nz/multi-modal/keystrategiesandplans/road-safety-strategy/>

3.3 NZ TRANSPORT AGENCY

National Land Transport Programme

The Transport Agency's National Land Transport Programme (NLTP) identifies that a well-functioning transport system connects people, communities and businesses, helps the economy grow, and shapes the development of our towns and cities. It must be easy to use and, above all, needs to keep people safe.

The NLTP is a three-year programme of planned activities and a 10-year forecast of revenue and expenditure prepared by the NZ Transport Agency to give effect to the GPS. Through the 2018-2021 NLTP, the Government will invest \$4.3 billion to reduce DSI.

There is agreement at both local and central government level that a renewed focus on safety is required, and the NLTP will invest in key initiatives for action with Auckland Transport. This will include

- The introduction of new safety (speed and red-light) cameras, which will address the highest risk roads and intersections.
- The Safer Communities Programme to improve walking and cycling safety in high risk communities
- Speed Management Programme will address safety and operational deficiencies and implement a strategic speed management approach across Auckland's road network.
- New road safety education and awareness programmes.
- Urban Road Safety Programme with a focus on vulnerable road user safety (walking, cycling and motorcycling)
- Rural Road Safety Programme
- Road policing enforcement

3.4 AUCKLAND TRANSPORT

Auckland Transport Statement of Intent

The Auckland Transport Statement of Intent 2018/19-2020/21, states that one of AT's key priorities for the next three years is improving the safety of the transport system. It notes that preventive measures in road safety have not kept up with the growing population and that there is an upward trend in DSI.

Auckland Regional Land Transport Plan

The Auckland Regional Land Transport Plan 2018-2028 (RLTP) published in May 2018 highlights that although DSIs had steadily reduced over the last thirty years to a record low in 2012 Auckland has subsequently experienced substantial increases in DSI since that low. The RLTP notes that the Auckland Road Safety Partners (AT, the Transport Agency, NZ Police, ACC) have identified several actions to improve Auckland's road safety outcomes in the short term, including:

1. Improved Safe System road safety governance structures and knowledge transfer
2. Speed management, technology and enforcement of safe driving behaviours
3. Safety engineering investments at high-risk intersections and road corridors
4. Mass action safety improvements for vulnerable road users
5. Ensuring Safe System design improvements through Capital, Maintenance and Renewals programmes

6. Support for increased Auckland Road Policing activities and further investment in technology.

The activities in the proposed transport programme include:

1. Rural Road Safety Programme to address the highest risk rural roads and intersections
2. Urban Road Safety Programme to address the highest risk urban roads and intersections
3. Safer Communities and Speed Management Programme to address safety and operational deficiencies and implement speed management across Auckland's road network
4. Safety and Red Light Cameras – delivery of cameras and monitoring of high-risk areas
5. Road safety education and awareness programmes targeting high-risk behaviours.

In response to the direction set by the GPS, the RLTP has increased funds for Road Safety projects to \$800 Million over the next ten years. 2018/19 is the first delivery year under the new road safety budget within which AT will deliver an accelerated programme of safety investment.

Auckland Transport Alignment Plan (ATAP)

ATAP defines a programme of transport investment specifically for Auckland, which brings together the intentions of the GPS and the strategies from the RLTP. There are a range of large capital projects and minor works type programmes promoted within ATAP. Road Safety is one of the prominent themes within the plan.

The proposed road safety programme will need to respond to, support or align with other major transport investment around Auckland. The Auckland Transport Alignment Plan (ATAP) 2018 contains around \$28 billion of investment in Auckland's Transport system, including just over \$900 million in road safety programmes.

ATAP includes several major new transport projects including:

- Light Rail (City-Airport and Northwest corridors)
- Eastern Busway (Panmure to Botany)
- Airport to Botany (Airport-Puhinui section)
- Rail network upgrades
- New electric trains

As well as future priorities including further rail network upgrades to enable express trains, north shore strategic connections, upper harbour strategic connections and cross-isthmus corridors. The key safety outcomes expected from the ATAP package include a 60% reduction in DSIs on Auckland's transport network, from 813 in 2017, to no more than 325 by 2027.

Auckland Transport Road Safety Strategic Case

The 2015-2018 Strategic Case for Delivering Road Safety for Auckland's Roads (2014) developed a strategy to “deliver against RoadSafe Auckland's (Auckland Transport, NZ Police, NZ Transport Agency) commitments to Safe Roads & Roadsides, Safe Speeds and Safe Road Users on the Auckland transport network”. The Strategic Case established a starting point for developing a step change in efforts towards improving road safety. However, the AMP supersedes this document until the PBC is finalised.

3.5 AUCKLAND PLAN 2050

The Auckland Plan 2050 is a long-term spatial plan for managing Auckland’s growth and development over the next 30 years, developed by Auckland Council. The plan identifies “maximising safety and environmental protection” as one of the three key directions of the Transport and Access outcome.

An emphasis is placed on the need to address the unacceptable levels of harm that Auckland’s transport system is having on people and the environment. That emphasis prioritises safety in decision-making. The plan specifically notes that ‘Vision Zero’ should be used as a guide to reverse Auckland’s worsening safety trend. The proposed road safety programme undertakes an approach that is consistent with the following priorities:

- Improve the safety for those walking, cycling or riding motorcycles
- Address safety issues for people crossing roads and railways; and
- Improve personal safety and security while travelling.

4 GOVERNANCE AND STAKEHOLDER ENGAGEMENT

This project is part of AT’s road safety programme. The governance structure and communication lines for stakeholder engagement is shown in Figure 4-1 and detailed in Appendix B.

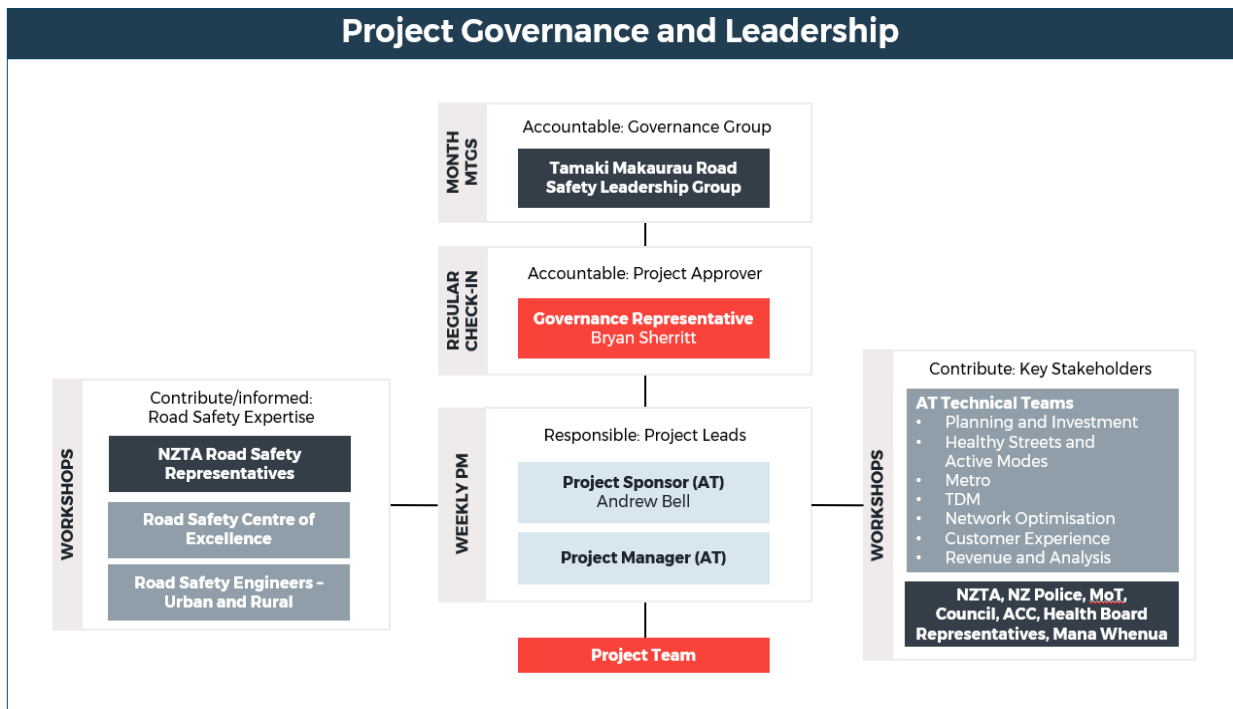


Figure 4-1: Project Governance & Leadership

Investment Partners

The Tamaki Makaurau Road Safety Partnership forms the group of key investment partners for the programme. This partnership is comprised of:

- Auckland Transport
- Ministry of Transport
- New Zealand Transport Agency
- New Zealand Police
- Auckland Council
- Accident Compensation Corporation
- Combined Auckland District Health Boards



Stakeholders




Specific Engagement with key stakeholders was undertaken through this business case process, mostly in the form of workshops. The key stakeholders were identified through examining the old RoadSafe Auckland partnership (now Tamaki Makaurau Road Safety Partnership). There are other parties that are not included as a key stakeholder but were consulted as required to enhance development of the programmes.

Details of stakeholder workshops and consultation is provided in Appendix B.

5 OUTLINING THE NEED FOR INVESTMENT – THE PROBLEMS AND EVIDENCE

5.1 DEFINING THE PROBLEMS

A facilitated investment logic mapping workshop was held on 11 June 2018 with key stakeholders to gain a clearer understanding of current issues and needs relating to road safety in Auckland. The stakeholder panel identified and agreed the following key problems and weightings:

| Problem Statement | Weighting |
|---|--|
| Problem one: Insufficient leadership and priority for road safety in policy and decision making has prevented the full delivery of a safe system |  40% |
| Problem two: Unsafe roadside and street design increases speeds, the impact of small mistakes, and discourages healthy transport choices |  35% |
| Problem three: Risky road user behaviour, insufficient enforcement, and (<i>poor</i>) understanding of the road safety problem, have contributed to the increase in death and serious injuries |  25% |

The full Investment Logic Map is provided in Appendix C.

5.2 PROBLEM 1 - EVIDENCE

PROBLEM 1:

Insufficient leadership and priority for road safety in policy and decision making has prevented the full delivery of a safe system

Road safety has not been a priority for the decision makers and leaders who influence the delivery of Auckland's transport system. At a strategic level, road safety was considered second to major capacity-adding projects and has been viewed as a separate small programme of infrastructure delivery using a siloed approach (with little or no loopbacks or lessons learnt), rather than incorporated as a core principle within the planning, design and delivery of all transport projects. Instead, efficiency has traditionally been viewed as a priority, and more recently mode shift to higher productivity modes has also eclipsed the issue.

Business Improvement Review

A major review (BIR) was undertaken in 2018 and summarised there were many issues that needed to be addressed and which validate problem 1. According to the BIR, this issue has prevailed through transport investment decision-making, including within Auckland Transport who are primarily responsible for improving safety on local roads in Auckland. *“Senior staff readily confirmed that road safety had not been a high priority in the business since start-up seven years ago. Comment was received that safety had kept getting pushed downwards within the organisation. There was some frustration expressed by AT Board Members that they had received little information about road safety performance, strategy, key issues and actions being taken to respond to those issues.”*

Some of the key findings relating to leadership and priority for road safety within the BIR are:

- Road safety has been a small, “necessary add-on” to AT’s core activity, in the past. This has not produced appropriate DSI reduction in Auckland.
- Safe System principles are not well known in AT
- AT has important but limited direct road safety delivery responsibilities.
- RoadSafe Auckland has no adopted strategy (previous regional strategy expired in 2012) nor has one been considered by ELT
- AT relies on RoadSafe Auckland partnership to deliver enforcement initiatives.
- AT relies heavily on central government to deliver on the adopted Strategy (Safer Journeys), national campaigns, emerging issues and identified areas of legislation/policy not meeting accepted international practice.
- AT has not successfully pressed the central government for priority change.
- Substantial change management required in AT to improve understanding, direct role, advocacy role, performance

Road Safety Expenditure

Road Safety programmes have historically been severely underfunded in comparison to the size and cost of the problem. While people are killed and severely injured on Auckland’s roads every year, resulting in a social cost that likely reaches the hundreds of millions, the total investment in road safety has been limited by the difficulties associated with securing funding.

In the past, Auckland transport has tended towards delivering road safety projects of less than \$1 million, as these are considered low cost and low risk, and are not required to be approved through a cumbersome business case process. The planned annual expenditure was usually around \$20 million, but typical annual expenditure was nearer \$10 million per annum for major infrastructure safety works, comprised of reactive road safety improvements and little noticeable change to the road toll.

In comparison, hundreds of millions (billions) of dollars of tax-payer funds have historically been directed towards large capacity-adding projects on the road network. These projects often help relieve congestion and consider local safety, and it is possible that these types of projects restrict Auckland Transport’s ability to resource the wider road safety problem or have not realised the potential safety benefits that could have been gained.

Historic evaluation methods for transport investment

The previous investment assessment framework (IAF) for the last NLTP period (2015 to 2018) used strategic alignment, effectiveness and efficiency (BCR) to assess funding priorities. This criterion placed a greater emphasis on the benefits derived from using EEM procedures as well as government priorities at the time. The EEM provides guidance on evaluation of transport benefits that emphasizes the value of time, as such prioritising efficiency over other outcomes. While road safety benefits and social benefits can be monetised, these are often under-valued

The IAF methodology left no room to prioritise projects based on value of life. However, the 2018-2021 IAF now places greater emphasis on safety and priority is given to highest safety risk projects over the BCR.

In addition, funding allocated from the NLTF towards road policing has restricted the resources of the New Zealand Police Force, resulting in inadequate levels of enforcement.

According to information provided by the NZ Police in an NZ Herald article (May, 2018⁵), road policing funds have historically “fallen behind police operational requirements”, particularly as travel around Auckland increases.

Summary

The following statements summarise issues that have led to the emergence of Problem 1:

- The BIR identified several leadership and policy issues which has hampered delivery of an effective road safety programme in Auckland, not only for AT but also a lack of priority for road safety in government and agency leadership;
- Road Safety programmes, including road policing have historically been severely underfunded in comparison to the size and cost of the problem; and expenditure for road safety has been prioritised lower than other mobility and traffic engineering projects.

5.3 PROBLEM 2 EVIDENCE

PROBLEM 2:

Unsafe roadside and street design increases speeds, the impact of small mistakes, and discourages healthy transport choices

This problem statement was derived to capture the issues around the current road network in Auckland being relatively “unforgiving” of the errors of road users. The issue is present through a number of layers to do with the provision of infrastructure:

- Planning streets in the context of movement demands and adjacent land use activities.
- Infrastructure Design guidance and process does not adequately respond to crash risk or allow for road user error especially for vulnerable road users.
- Vehicle speeds are not well managed through design and regulation to survivable limits, resulting in environments which allow or even encourage excessive and unsurvivable vehicle speeds.

The consequence is a street environment that does little to reduce the risk of serious injury or death during a crash, as well as transport users electing the modes in which they feel safer, i.e. door-to-door car travel.

Infrastructure and Risk

In Auckland, an infrastructure rating has been assessed for all roads as shown on Figure 5-1. The highest risk roads are shown as black, with red being medium- high infrastructure.

When we look at the analysis of the corridor ratings provided, and the rate of crashes and risk exposure along corridors indicates that 1,025km of high-risk roads (13% of the network) carries 51% of the total crash risk on the network. These corridors exhibit high volumes of high severity crashes and thus high collective and personal risk.

A similar analysis for crash volume and risk exposure at intersections reveals that 300 high risk intersections (2% of the intersections in the network) carry 25% of the crash risk.

The approximate location of these corridors and intersections are shown on Figure 5-2. Many of the corridors and intersections of highest risk are concentrated around the central isthmus.

⁵ “Failings all around: Auckland’s catastrophic road safety record”, NZ Herald, May 2018, https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12058539

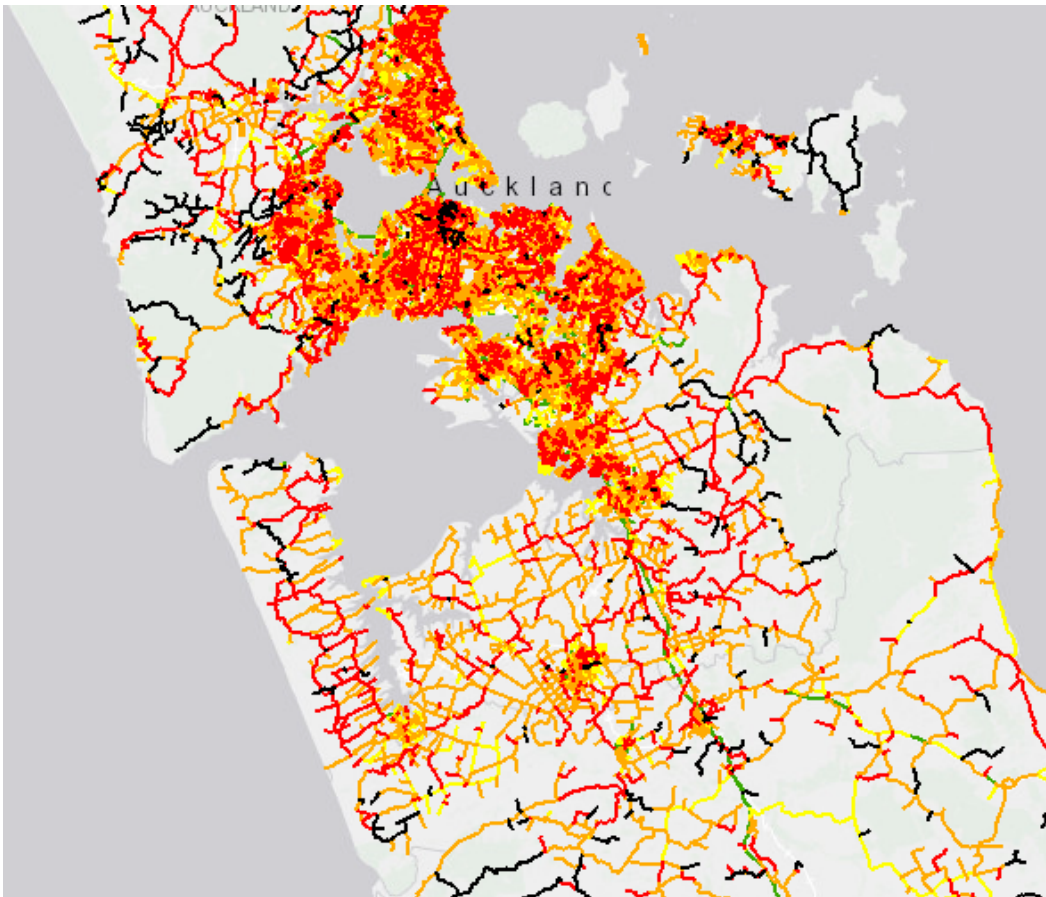


Figure 5-1: Infrastructure Risk Rating (IRR) (Source: Mega Maps)

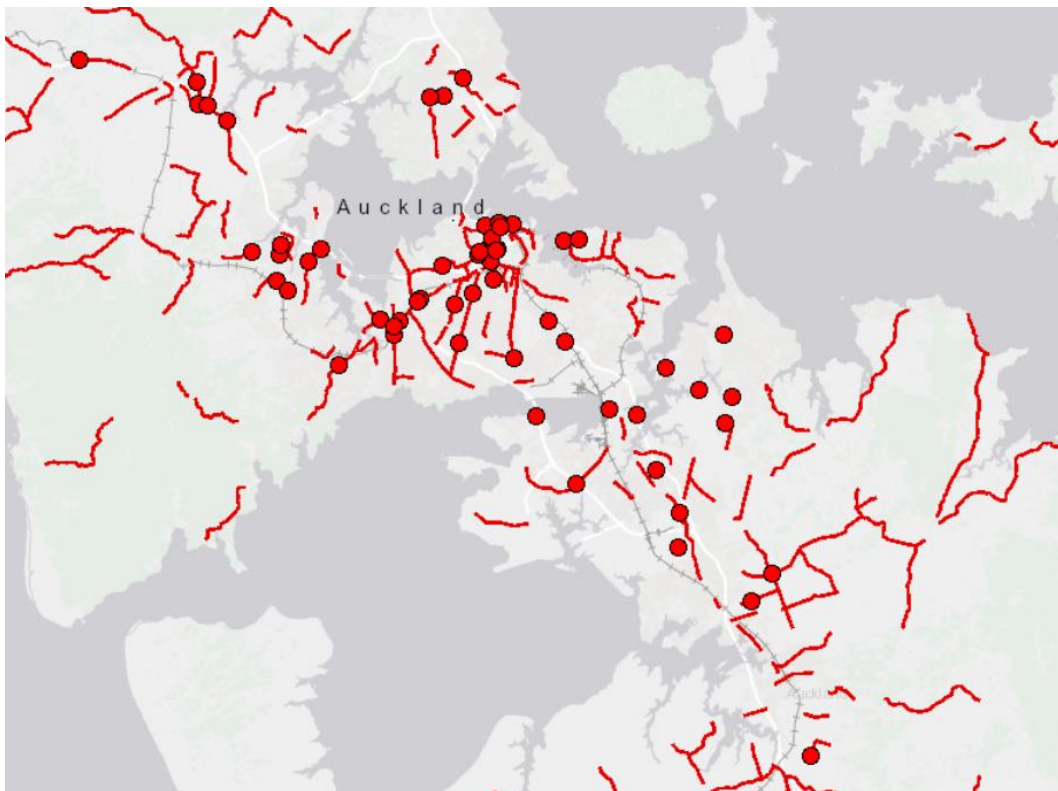


Figure 5-2: High Risk Corridors and Intersections (Source: Mega Maps)

Infrastructure and Speeds

Unsafe Street Design includes inappropriate road widths that encourage higher speeds, to poorly designed intersections, unexpectedly sharp bends, lack of safe and convenient footpaths, cycle lanes and pedestrian crossings. Auckland's typical wide roads with generous geometry favour the experience of the vehicle driver by encouraging higher speeds.

The number of DSI on Auckland's roads attributed to excessive speed has increased substantially since a low of 86 in 2011 to 214 in 2017, however the proportion of all DSI attributed to excessive speed by NZ Police has remained between 19% and 26% over the period considered (Figure 5-3).

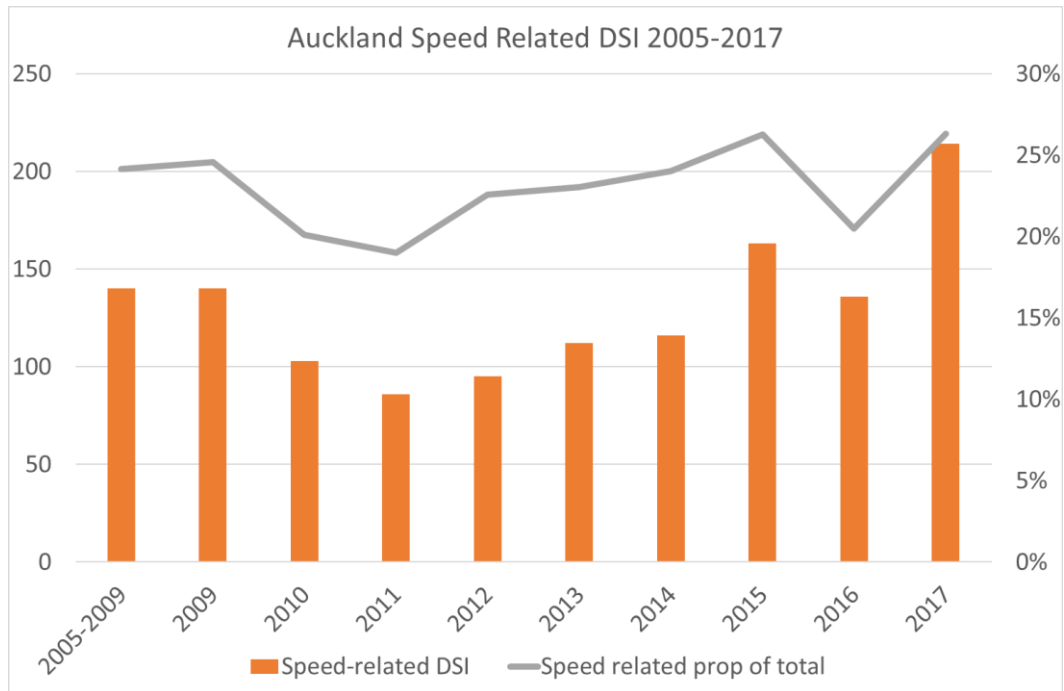


Figure 5-3: DSI reportedly involving excessive speed in Auckland (2005-2017)

Analysis of recorded speeds on Auckland's roads suggest that speeding is becoming less prevalent and has reduced on both open and urban roads, with the 85th percentile speed on open roads in 2015 recorded to be 103 km/h, while on urban roads it was 55 km/h (Figure 5-4). However, these speeds are still not within tolerance levels for high severity outcomes. From a Vision Zero and Safe System approach, new research⁶ indicates that these speeds need to be a lot lower (Figure 5-4). In fact, the 85th percentile of urban roads of 55km/h, is still 35km/h over the critical impact speed for pedestrians.

Urban and Rural Crash-risk & Infrastructure

Analysis of 2018 DSI by ONRC road type shows that 30% of road trauma is generated on Open Roads with a 100 to 80kph speed limit. These are mostly undivided Local Roads and some State Highways, that are generally unforgiving in terms of infrastructure. The majority (60%) of Auckland 2018 DSI occurs on Urban Local Roads of 50kph or less and 8% on 70-60kph Local Roads. Road trauma in these locations is over-represented by vulnerable road users.

⁶ https://www.researchgate.net/publication/304529995_Exploration_of_Vehicle_Impact_Speed_-_Injury_Severity_Relationships_for_Application_in_Safer_Road_Design/figures?lo=1

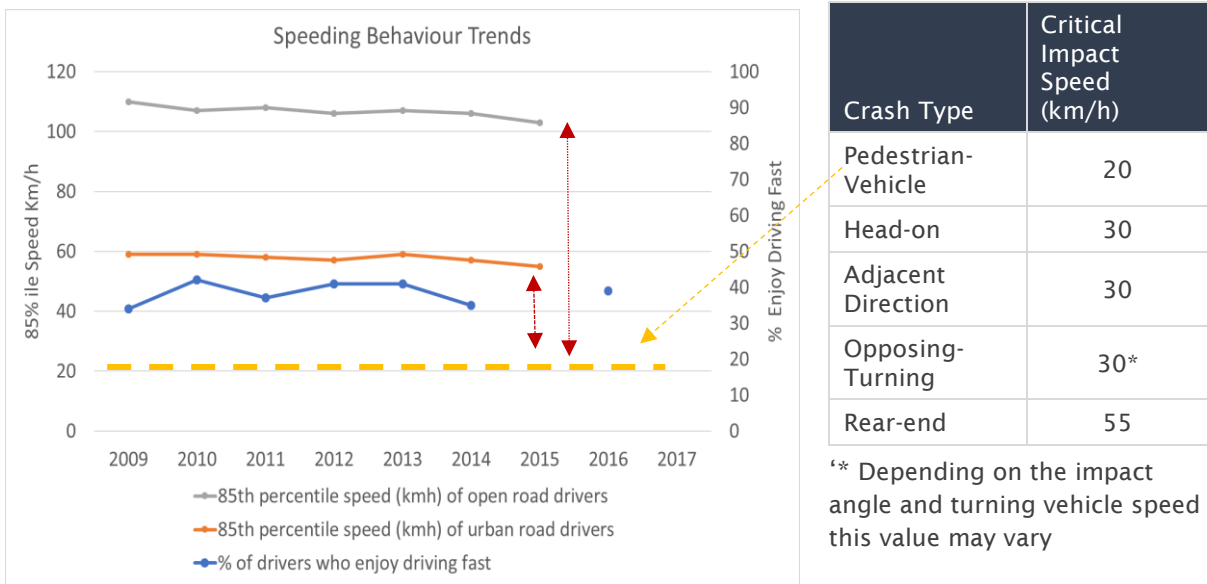
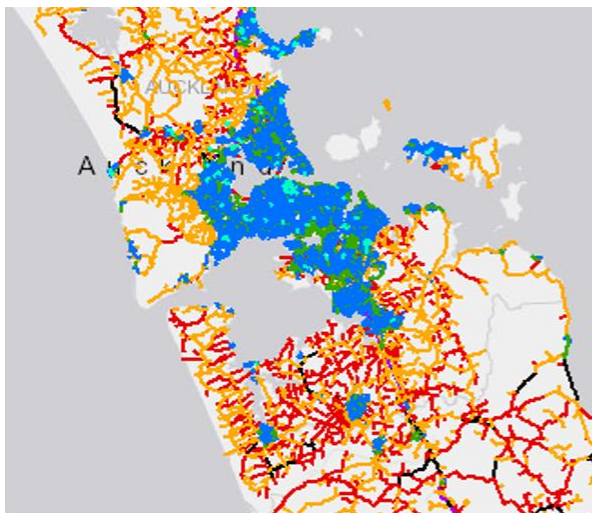


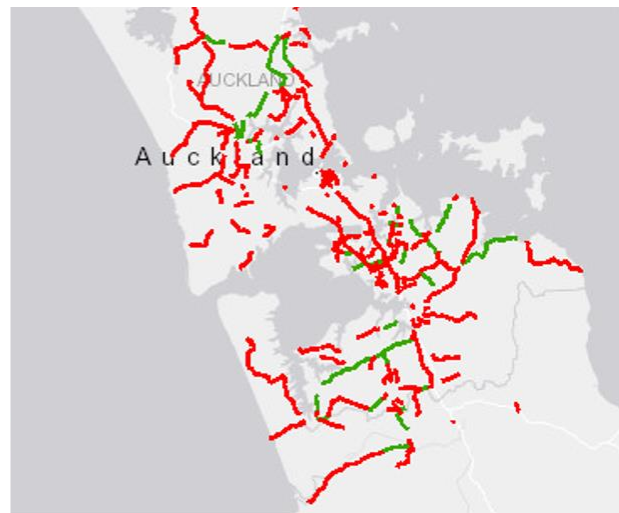
Figure 5-4: Auckland Speed behaviour trends (2005-2017); Approximate critical impact speeds for common crash types

In terms of risk and function of the roads, Figure 5-5 shows the safe and appropriate speed for the function of the route and where there might be benefits from addressing speeds. These maps show where road function might suggest to “engineer up” or where there might be a challenging conversation about reducing the speed due to risk. 71% of AT’s road network is currently identified as not being aligned with Safe and Appropriate speeds.



Safe and Appropriate Speeds (Calculated)

- 30 and below
- 40
- 50
- 60
- 80
- 100
- 110



High Benefit Speed Management

- Top 10% DSI Saving Network Sections (18-21 GPS Target)*
- Challenging Conversations
 - Engineer Up

Figure 5-5: Safe and Appropriate Speeds and High-Speed Benefits routes (Source: Mega Maps)

Mode Availability

The quality of infrastructure, particularly for vulnerable road users, has an impact on transport choices. According to the findings of the Auckland Cycling PBC, transport customers would cycle more if safer infrastructure was provided. As such, Auckland's roads present a complex speed environment where the needs of drivers must be weighed in with the needs of vulnerable road users.

Lastly, 40% of AT's DSI occur on one predominant road type - 50kph urban arterials. More than half of these DSI's involve vulnerable road users (people walking, cycling and motorcycling). This suggests a strong focus required to improve the safety of vulnerable road users on 50kph urban arterials.

Additional detailed evidence on urban and rural splits and cause factors are provided within Appendix A.

5.4 PROBLEM 3 EVIDENCE

PROBLEM 3:

Risky road user behaviour, insufficient enforcement, and (poor) understanding of the road safety problem, have contributed to the increase in death and serious injuries

The evidence for this problem is varied and derives from crash records, traffic monitoring and attitudinal surveys and relates to drinking and drug use, speeding, seat belt and restraint usage, intersection safety, and driver fatigue and distraction. In addition, information about levels of enforcement have been discussed.

General and Location

In the Auckland Region, including State Highways, there were 3,066 DSI in the 5-year period 2013-17. Of those DSIs, 85% (2,607) were recorded on Auckland Transport Roads. Importantly, the number of reported DSIs on AT's roads has increased by 70% since 2012, compared to 30% increase across New Zealand. A detailed analysis of the crash history is presented in Appendix A, and highlights the following key observations:

- In the 5-year period from 2013 to 2017 there were 2,355 fatal or serious crashes in the AT controlled network, resulting in 2,607 DSI
- DSIs increased by 70% in that period, a much higher increase than the rest of NZ (30%) and a much higher than the increase in population or travel
- The urban south of Auckland had the highest number of fatal and serious crashes.
- The increase in fatal and serious crashes was more notable in the urban areas (excluding the city centre)
- Overall, 30% of the fatal and serious crashes were intersection crashes, 30% were loss of control crashes (more prevalent in rural areas), and 20% were pedestrian crashes
- 51% of the fatal and serious crashes occur on 13% of the roads.
- 40% of the DSI occur on one road type - 50kph urban arterials
- 25% of the intersection crashes occur in the top 2% of the intersections in the network

Analysis of the relationship between reported DSI in the CAS system and recorded hospitalisations (**Appendix A**) indicates that the reporting rate has recently increased. Between the 2008-2012 average baseline and 2017, Auckland's:

- Fatalities;
- Hospitalisations over 1 day;
- ACC motor vehicle claims;
- Total vehicle km travelled; and
- Population,

have all increased by 20-30%, while Police recorded DSI have increased at a higher rate since 2014 with a spike in 2017 to be 60% higher than the 2008-2012 average.

This indicates that the increase in reported DSI since 2014 may partly be attributable to an increase in reporting rates. Further analysis will be needed with updated figures to determine whether this is an actual trend.

Variation also occurs in Police recording of contributing crash factors including Speed, Distraction, Alcohol/Drug and Fatigue due to the difficulties in proving causation at the time of the crash. Equally, walking, cycling, motorcycling and rural crashes are believed to be significantly under-reported as a result of either not being brought to the attention of Police, or incorrect Police or self-report assessment of the serious nature of the injuries.

Speeds

Refer section 5.3. In Summary:

- Although it appears that speeding is becoming less prevalent, 25% of the DSIs are still related to excessive speed as defined by Police; and
- There is a proven link between speed and severity of crashes. There are a significant number of roads in Auckland where the average vehicle speed is higher than recommended safe or appropriate speeds, suggesting either these roads should be improved, or the speeds should be reduced.

Analysis by Casualty Type/Mode

The majority (55%) of DSIs were to car (including van and truck) drivers and passengers (Figure 5-6). Motorcyclists (including moped riders) are significantly over-represented in DSI statistics relative to their usage, with 592 motorcyclists killed or seriously injured, representing just under 20% of all DSIs in Auckland. 546 pedestrians were killed or seriously injured, representing 18% of the total. 232 cyclists were killed or seriously injured, 7.5% of the total. These figures reflect the higher vulnerability of these road users compared to car, van and truck occupants.

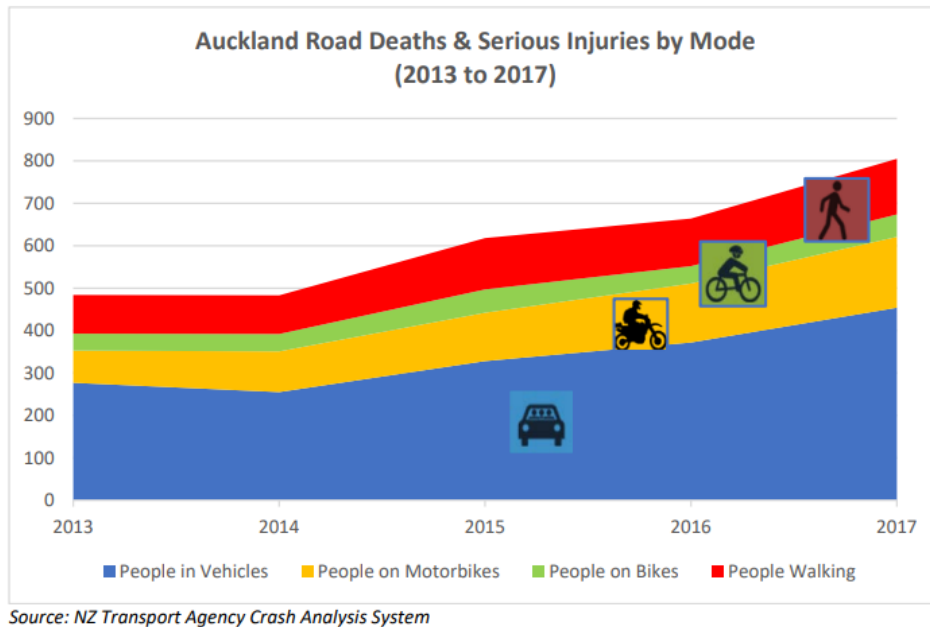


Figure 5-6: Auckland Death and Serious Injuries by Mode 2013-2017 (source Regional Land Transport Plan 2018-2018, Auckland Transport)

Cause - behaviour

The following is a summary of the crash analysis in terms of behaviours.

- Drinking and Drugged driving reduced substantially from 2009 to 2014 but has increased significantly in 2017 to be 26% of the proportion of DSIs.
- The proportion of DSI drivers recorded as not wearing a safety belt has declined markedly from 39% in 2011 to 13% in 2017.
- The number of DSI attributed to fatigue has remained relatively constant over the last 12 years.
- The number of DSI attributed to distraction has followed a remarkably similar pattern to fatigue related DSI but has been steadily increasing from 36 in 2013 to 64 in 2017.





Enforcement

- Police enforcement covers only a small proportion of the high-risk behaviours on the network. Current operational measure such as high speed tolerances on speeding detection reduce the effectiveness of Police enforcement efforts. Widespread general deterrence of low-level speeding is considered more likely to increase population compliance.
- The BIR stated that the detection of speeding offences could be improved, through lower tolerance levels and more mobile speed camera use.
- The constraint on resources relates in part to inadequate funding for Police operational requirements, which has been consistently lower than required for that last several years (refer Problem 1).
- There has also been a reluctance of central government to apply demerit points for speeding offences detected by cameras as well as the relatively low fine levels. These are both inconsistent with best performing road safety cities.

Further analysis of the data is provided in Appendix A.

5.5 THE BENEFITS OF INVESTMENT

The potential benefits and measures of success (KPIs) of successfully investing to address these were identified as part of a second facilitated investment logic mapping workshop. The stakeholder panel identified and agreed the following potential benefits for the proposal:

| Benefit Statement | Weighting |
|--|--|
| Benefit one: Sustained reduction in road deaths and serious injuries |  40% |
| Benefit two: Safe and healthy streets for everyone |  10% |
| Benefit three: A safe roadside and street environment |  30% |
| Benefit four: Safe road user behaviour |  20% |

The benefit map is attached as Appendix C.

5.6 INVESTMENT OBJECTIVES

LINKAGES OF EVIDENCE TO THE PROBLEMS AND BENEFITS

The project investment objectives were drafted based on inputs from early project stakeholder workshops and further refined based on a set of performance indicators within the Auckland Transport Vision Zero Strategy, which was developed separately by Auckland Transport. The objectives link to the agreed investment benefits, and can be measured (refer ILM in Appendix C). Links between the overarching performance indicators from the Vision Zero Strategy and the Investment benefits and objectives of the PBC are also shown in Appendix C.

In addition, performance indicators for the purpose of monitoring and evaluating the programme are discussed in Part C, Management Case.

| Investment benefit | Investment objectives (DRAFT) |
|--|---|
| Benefit one: Sustained reduction in road deaths and serious injuries | <ol style="list-style-type: none"> 1. Reducing road deaths and serious injuries by 60% from 690 in 2017 to no more than 276 by 2028. |
| Benefit two: Safe and healthy streets for everyone | <ol style="list-style-type: none"> 2. Safe and Healthy streets for everyone evidenced by increasing PT and active mode use from 16% (Journey to work mode share 2013) to at least 21% by 2028. 3. Safe and Healthy Streets for everyone by improving health, emissions and social outcomes (measure and baseline to be developed). |
| Benefit three: A safe roadside and street environment | <ol style="list-style-type: none"> 4. A safe roadside and street environment by increasing the proportion of vehicles surveyed travelling within posted speed limits from XX% to XX% by 2028. Baseline to be established. 5. A safe roadside and street environment by increasing the proportion of the road network where speed limits are adjusted to align with Safe |

| | |
|--|---|
| | <p>& Appropriate Speeds from 29% to 60%. (baseline and targets to be confirmed).</p> <p>6. 20% of rural VKT are on roads that provide safe system primary and supporting treatments (e.g three barrier system) by 2028*.</p> <p>7. Improved safety of infrastructure for vulnerable road users in urban areas such that there is an increase in the proportion of VRU trips that use safe routes (e.g. protected cycle facilities) see Performance Measures, Chapter 11)</p> <p>8. Community perceptions of streets, footpaths, pedestrian crossings, cycle facilities and end-to-end public transport as a safe environment for active modes is increased (measured by customer perception survey – baseline to be developed).</p> |
| Benefit four: Safe road user behaviour | <p>9. Sustained increase in proportion of drivers detected as:</p> <ul style="list-style-type: none"> • Being within the legal Blood Alcohol Content (BAC) level; • Not using a cellphone while driving; and • Being appropriately licenced. <p>(baselines and targets to be confirmed with NZ Police)</p> <p>10. Community and Tamaki Makaurau Governance Group staff are aware, understand and support the Vision Zero approach including speed management. (measured by perception surveys – baseline to be developed).</p> <p><i>*Primary treatments are those that have the potential to achieve the Safe System objectives of near-zero deaths and serious injuries. Supporting treatments (Turner et al. 2009) reduce the likelihood of a crash, but do not fully reduce the consequence or severity of a crash should one occur (Austroads Research Report AP-R509-16, Safe System Assessment Framework, February 2016).</i></p> |

Note: some these objectives do not include baseline or specific targets, which will be developed further once the scope of the programme is understood.

WHAT DO WE NEED TO ADDRESS THE PROBLEMS?

The key areas that need to be addressed when developing the programmes, in addition to meeting the investment objectives are:

- Agreement of a strategic direction and coordination of organisations reflective of the vision of the Road To Zero and the GPS
- Commitment to further research into systematic causes of DSIs with updated investment and policy response
- Policy that encourages improvements to procurement, vehicle fleet safety, workplace Health & Safety and TDM
- Robust safety management systems introduced with clear accountability
- Embedding Vision Zero across Auckland Transport, policy and guidance and increased public visibility of that vision
- Identification of wider health and safety benefits

- Increased investment in dedicated road safety projects with robust monitoring and evaluation
- Step change in speed management and public acceptability
- Robust communication and education strategy
- Improved road safety enforcement, including technology

How success is measured throughout the course of any preferred programme is also essential. This is discussed further in section 11.

5.7 OTHER CONSIDERATIONS

There are several key issues and constraints on the programme, including identification of road safety issues, understanding the scale of the problems as well as the potential outcomes of the programme. Some of these could be resolved through active monitoring during delivery of the programme. However, the likelihood or extent of some of the issues is somewhat uncertain. A summary of the uncertainties is shown in the uncertainty log.

Issues

Issues such as population growth, growth in employment and changes to travel demand are difficult to define with certainty. However, the 10-year outlook for Auckland's land use plans and the 10-year programme of transport investment has been defined through The Auckland Plan, ATAP and the RLTP. These programmes help to provide some certainty on the structure of the network and characteristics of customer travel needs over the next 10 years.

External economic influences are more challenging to define and could impact whether Auckland's transport programme is funded or delivered. However, current government priorities are strongly in favour of road safety, as such the road safety programme is more likely than others to secure funding.

Advances in technologies, particularly around personal mobility, mode choice, data management and network monitoring offer opportunities to increase the effectiveness of programme outcomes, however they may also put pressure on AT as changing customer preference shift and change the road safety problems themselves or create new safety problems. AT will need to stay informed about changing technologies and influences on customers to adequately manage this uncertainty.

The uncertainty log is shown in Appendix D.

Constraints

The constraints on the programme are largely focussed around the policy, planning and delivery environment which has not yet fully aligned with the concepts presented by Vision Zero and Safe System principles. Some of the constraints on the programme include:

- Policy and regulatory framework around Road Safety not aligned with Vision Zero e.g. securing public support for approving by-laws for reducing speed limits
- Lack of resources across road safety partners, eg:
 - Auckland Transport staffing and resources are geared for delivery of smaller programmes
 - Police funding is inadequate for the operational requirements to increase enforcement.

- Workload prioritisation and efficiencies across key road safety partners
- Organisational processes and safety management systems (including funding/economic assessment or projects, prioritisation of funding of projects, inter-team alignment and agreement on project objectives, procurement, competing interests, benefits realisation)
- Application of Vision Zero/safe systems framework consistently across major capital and minor works programmes

5.8 CONFIRMING THE CASE FOR CHANGE

Part A (section 1 to 5) of this report documents the case for change and confirms that investment in Road Safety is needed on Auckland Roads because:

- There is an increasing road safety problem resulting in a significant number of DSIs, which based on population growth and travel demand will only get worse
- 2607 DSI occurred from 2013-2017; DSI increased by 70% in that period, a much higher increase than the rest of NZ (30%) and a much higher than the increase in population or travel
- Whilst several programmes are in place, further investment needs to be committed to reduce this number and move towards achieving Vision Zero.

PART B – DEVELOPING THE PROGRAMME

6 PROGRAMME DEVELOPMENT

6.1 SUMMARY OF APPROACH

The development of the programme involved several stages and different processes. The summary of the programme development approach is provided in Figure 6-1 and further detail is described in sections 6.2 onwards, as well as in Appendix E.

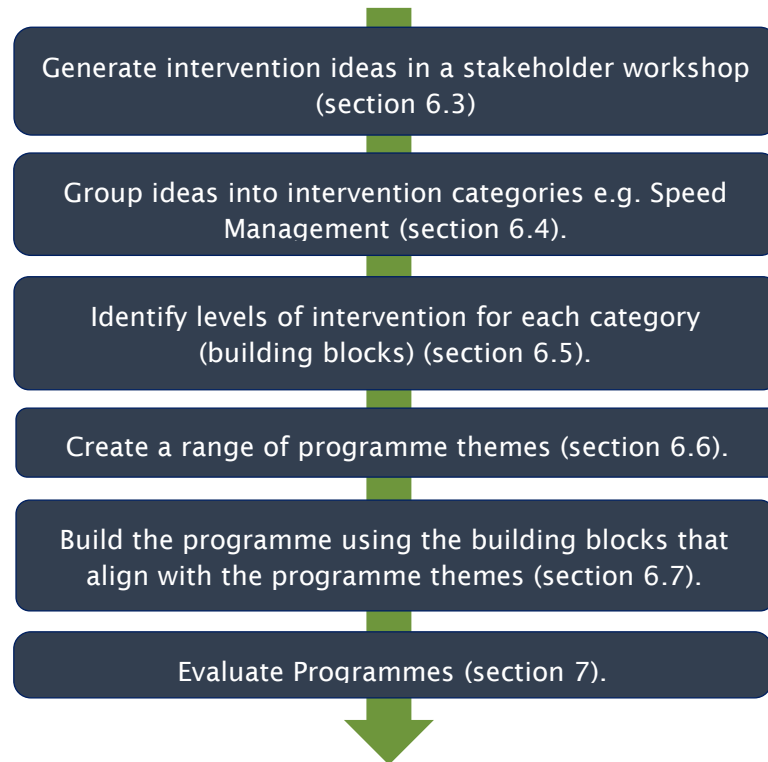


Figure 6-1: Road Safety Programme Development Process

6.2 THE 3 YEAR PROGRAMME COMMON TO ALL 10 YEAR PROGRAMMES

The first three years (2018/19 to 2021/22) of the Auckland Transport 10-year Road Safety programme has been agreed and the first year has been completed, albeit achieving less than originally forecast. This programme has a total expenditure of \$185M and is shown in Figure 6-2.

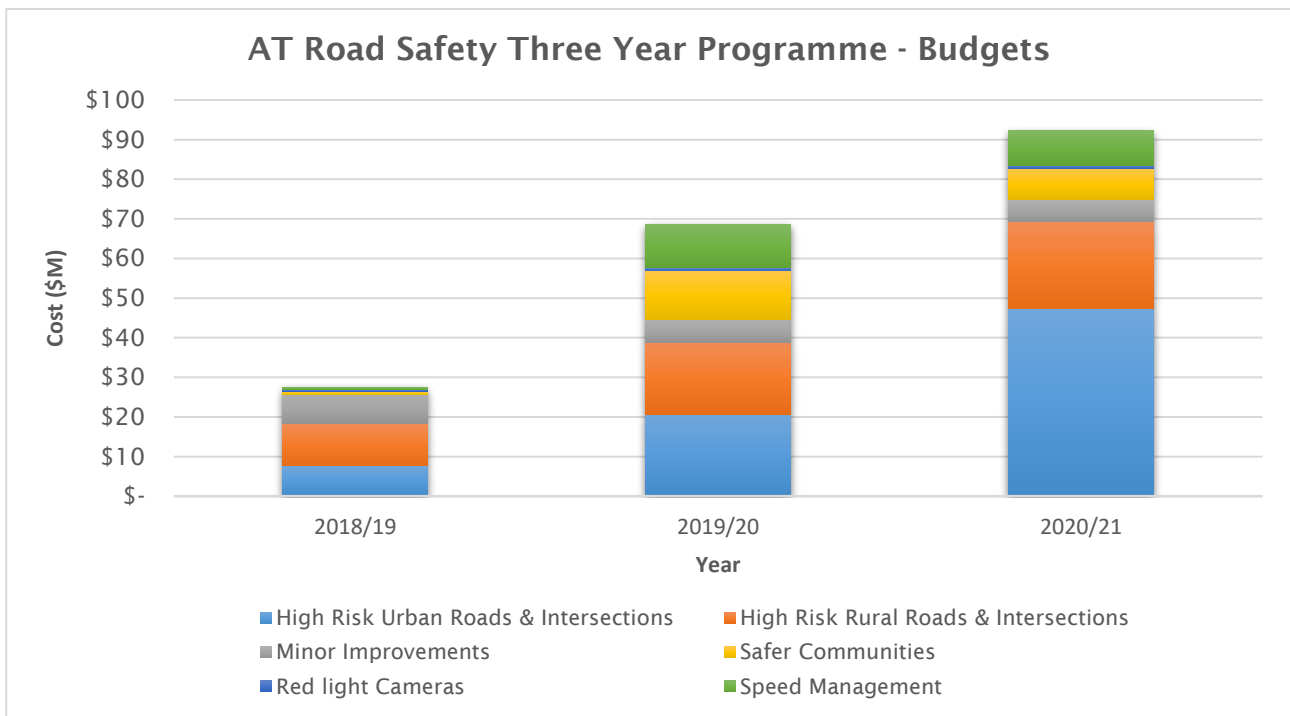


Figure 6-2: Three Year (2018/19-2021/22) Road Safety Programme

The forecast effect of the first three-year programme is to achieve a reduction in Auckland DSI of 125 DSI/year by the end of year 3, bringing the 5-year average DSI/annum down from 546 in 2014-2018 to 421 per annum in 2022.

The assessment of the original Three-Year Programme is covered in a separate report “Auckland Transport Road Safety Programme Business Case – Three Year Programme Review Report” and is updated to reflect the actual progress achieved in 2018/19 (see Three Year Programme Review Addendum report in Appendix F).

All Programme options developed and assessed within this PBC therefore will include the common first three years programme and its associated costs and benefits in the assessment of final outcomes and consideration of budgets.

6.3 IDEA GENERATION

The development of programmes started with a workshop with key stakeholders, including representatives from Auckland Transport, New Zealand Transport Agency, Auckland Council and NZ Police. Stakeholders were asked to consider a range of ideas and blue sky thinking to how the agreed problems (section 5.1) could be addressed and the benefits realised. Stakeholders were also asked to consider road safety from the wider perspective of a multi-organisational response. The following principles were discussed:

- Safety for all road users’ needs to be embedded in planning and design, as early as possible.
- Multiple agencies should be involved in identifying countermeasures and sharing responsibility of the programme
- Programme should be based on Safe System principles, tailored to different levels of road hierarchy, mode priority and coverage (network vs corridor)
- Funding allocation should reflect the scale of problem and level of investment required
- Consideration should be given to developing innovative, cost-effective countermeasures, including interim solutions to high-risk areas.
- Good understanding and prioritisation of desired safety benefits and outcomes and optimisation of benefits wherever practicable.

- Requirements for monitoring and evaluation of the safety performance of the network

Those ideas could fall in to one of four categories New Infrastructure (Supply), Best use of existing network (Productivity), Demand Management (Demand) and Integrated Planning as per the intervention hierarchy developed by the NZ Transport Agency⁷.

The full list of ideas developed by the stakeholders are provided in in Appendix G and included a range of other initiatives to address the confirmed problems, including leadership and policy, transport demand (changing traffic demand and modes), supply (build infrastructure), and productivity (best use of the network), education, enforcement and leadership. A summary of those measures and which alternative category it falls under is provided in Table 6.1.

Table 6-1 Summary of Ideas

| Ideas | Alternative (Category) | | | | | |
|---|------------------------|--------|--------------|--------|-------------|-----------|
| | Leadership and policy | Demand | Productivity | Supply | Enforcement | Education |
| Safe System Training (internal/external)- cultural shift | ✓ | | | | | |
| Set up Multi agency approach for governance group (approach and standards), Land use planning to promote mode shift, Road Safety Hub | ✓ | | | | ✓ | ✓ |
| AT - Improve and consider safe system in, maintenance standards, vehicle fleet, Driver Training, Design standards, Tender evaluation | ✓ | | | | | ✓ |
| Wider central govt changes including increased penalties for behaviour including alcohol, speed, phone etc., autonomous vehicles, vehicle safety, increased Police funding | ✓ | | | | ✓ | ✓ |
| Encourage Mode Shift and reduce traffic/ by Travel planning, TDM, Mobility as a Service (MaaS), Smart Cities, Cycle strategy, Parking strategy, Pricing strategy, Park and ride, Integrated corridors | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Distribute traffic to various routes/high risk times to reduce exposure | | ✓ | | | | |
| Speed management - Targeted (Risk) and Mass Action (ONRC, area) | | | ✓ | ✓ | | |
| Technology (PTP cameras, dynamic lanes, infra-red HOV, active studs) | ✓ | | ✓ | | ✓ | |
| Lighting | | | ✓ | | | |
| Target to risk plan/Visible enforcement/RBT/Demerits | ✓ | | | | ✓ | |
| Travel Planning (AT/School/Subdivisions) | ✓ | ✓ | | | | ✓ |
| Social media/Traditional media safety messages (behaviours, motorcycles) | ✓ | | | | | ✓ |
| Temporary/short term LATM on high risk corridors, sites/areas - people | | | ✓ | ✓ | | |
| Safe and Appropriate Speeds-urban/rural/schools/top 10% | ✓ | | ✓ | ✓ | ✓ | ✓ |
| High risk locations - Transformational (top sites), | | | | ✓ | | |
| High Risk locations - supporting Safe System measures, innovative tools - RSP, retrofitting. | ✓ | | ✓ | ✓ | | |
| Mass Action - rural delineation, cycling, tactile design, skid resistance, education campaign, healthy streets, equity | | | ✓ | ✓ | | ✓ |

⁷ <https://www.nzta.govt.nz/assets/resources/The-Business-Case-Approach/PBC-intervention-hierarchy.pdf>

| | | | | | | |
|------------------------|--|--|--|--|---|--|
| Compliance on Vehicles | | | | | ✓ | |
|------------------------|--|--|--|--|---|--|

At this time, it was also decided that the Programme Business Case for Auckland Road Safety would focus on specifically Safety Capex investment. Auckland Transport also delivers maintenance activities and other capital projects (outside of Safety-specific investment in these areas), and this other investment will also deliver safety benefits, but this is not detailed in the programme business case. However, it was discussed that leadership and policy changes, as well as training delivered within the organisation will apply across Auckland Transport and result in increased alignment to road safety goals and directions.

6.4 GROUP IDEAS INTO INTERVENTION CATEGORIES

The workshop stakeholder group identified that having a programme with a range of alternatives from policy to infrastructure was important to address the problems. This was supported by a review of international and national best practice in Vision Zero and road safety⁸ which found that infrastructure improvements alone are not enough to eliminate DSI.

Grouping the long list of ideas into intervention categories showed that current thinking tended toward taking a balanced approach to solving the problem. Auckland Transport and project stakeholders agreed that it would require a multi organisational response.

The team then grouped the ideas in to more distinct themes to assist programme development. Noting that geographical based themes were discussed (i.e. a category which focussed on town centre, and areas with equity issues), however it was decided that geographical distribution of investment could be decided once a strategic-level programme of work was identified, as a form of prioritisation. For example, town centres could be addressed through speed management, education, and/or travel demand management categories. The following categories were tabled as potential themes (given the ideas generation) and were also agreed by the group. These categories are also consistent with the PBC Strategic Case, the one and three-year programme.

- Leadership and policy
- Engagement and Education
- Travel Demand Management
- Enforcement
- Speed Management (Infrastructure)
- Pedestrian Infrastructure
- Cycle Infrastructure
- Motorcycle Infrastructure
- Intersection Improvements
- Corridor Improvements

The full list of ideas under each category is provided in **Appendix G**. Once the categories were agreed, assumptions and levels of interventions were developed to provide ‘building blocks’ for the programmes.

6.5 DEFINE THE LEVELS OF INTERVENTIONS

For each of the intervention categories, various levels of typical interventions were defined to provide ‘building blocks’ with which programmes could be ‘built-up’. A full description of this process is provided in the technical note in Appendix E. A summary of the levels of intervention by category is shown in Table 6-2.





In summary, for each intervention category there were up to four levels of effort, creating four alternative building blocks under each category. Types of interventions were specified under each level along with assumption of what type of road that might be applied too, to describe what was intended for that level. For example, Level 1 may mean a low level of intervention, and in regard to

⁸ explored through the Three Year Short Term Programme Report

infrastructure interventions, Level 1 could be “signs and line-marking” applied across a wide area or portion of the road network.

The levels of investment for the “operational” activities (policy and leadership, engagement and education, enforcement and TDM) are in addition to rather than instead of current levels of investment in these activities. Specifically in respect to the proposed cycle infrastructure safety investment, this is in addition to the planned investment within the RLTP to deliver the Auckland Transport Cycling PBC and is expected to be focussed on high risk locations that are not within the identified priority routes for investment covered by the cycling PBC.

Table 6-2 Building Blocks – level of effort for each intervention category

| | | INTERVENTION CATEGORIES | | | | | | | | | |
|-------------------------------|---|--|--|---|---------------------------------|--|---|---|---|--|---|
| Level of Intervention | | Policy and Leadership | Engagement and Education | TDM | Enforcement | Speed Management | Pedestrian Infrastructure | Cyclist Infrastructure | Motorcycle infrastructure | Intersection improvements | Corridor Improvements |
| Level 1 typical interventions |  | Minor policy changes | Targeted engagement and education | Focussed travel planning (Schools, AT,) | Targeted additional enforcement | Signs and lines in selected speed-controlled areas | Improve existing, low cost and easy to implement | Improve existing, low cost and easy to implement | Improve existing, low cost and easy to implement (e.g. signs and lines) | Transformation on top 100 high risk sites | Transformation on top 370km high risk corridors |
| Level 2 typical interventions |  | Moderate increase in fines, increase standards of design etc. | L1 + additional campaigns | Improving safety around existing PT | L1 + more targeted areas | L1 + Focussed LATM minor | L1 + focussed raised platforms, kerbs, active signs | L1 + focussed improvements including limited separation | L1 + focussed surfacing improvements, hazard mitigation | L1 + Engineering upgrade on next 80 high risk sites | L1 + Engineering upgrade on next 11040km high risk corridors |
| Level 3 typical interventions |  | Substantial increases in fines Safe Vehicles R & D in new technology | L2 + increase magnitude and duration of campaigns | Encourage new mobility | L2 + Comprehensive | L2 + all other minor LATM | L2 + Comprehensive | L2 + Comprehensive | L2 + comprehensive | L2 + Signs and Line-marking on last 20 high risk sites | L2 + Signs and Line-marking on last 370km high risk corridors |
| Level 4 typical interventions |  | | L3 + comprehensive education and engagement strategy | | | L3 + bigger infrastructure | L3 + town centre transformation | L3 + town centre transformation | | | |

Refer Appendix E for urban and rural intervention level examples

| Urban Transformation Examples | Rural Transformation Examples |
|---|--|
| Roundabout, raised pedestrian crossing or raised intersection | Roundabout, wire-rope median barrier, side-barriers, bend correction |

6.6 CREATE PROGRAMME THEMES AND BUILD PROGRAMMES

The team created seven initial programmes with varying themes based on a different focus or objective for each programme. For example, the idea behind Programme 2 was to focus only the high-risk areas and implement highly effective measures to fix the problems.

Then the programmes were “built” using the building blocks (interventions and level of intervention) appropriate for each programme theme. For example, Programme 3 was aimed at contributing as much as possible to achieving Vision Zero, so the programme included building blocks from all intervention categories usually with a high level of intervention.

The initial list of seven programmes were presented to the stakeholder group and after some discussion four further programmes were added to the long list for evaluation. Noting that the additional programmes included in the refined long list are largely made from variations of the original seven programmes.

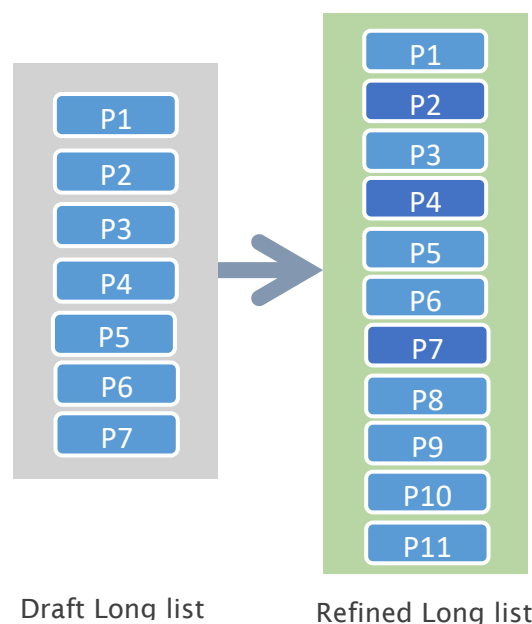


Figure 6-3: Refinement of long list

A full description of the programmes is provided in section 6.7, in summary there are 11 programmes included in the long list, and a base case. The full list of programmes are:

- P0 - Do Minimum (base case)
- P1 – 3-year programme extended to 10 years
- P2 – Focus on high risk areas and highly effective measures
- P3 – Contribute as much as possible to Vision Zero
- P4 – Focus on Speed Management
- P5 – Focus on Transformational Infrastructure
- P6 – Focus on Vulnerable Road Users
- P7 – Targeting 60% DSI Reduction
- P4B – Focus on Speed Management Version B
- P9 – Speed Management with some infrastructure
- P10 – Focus on Speed Management and vulnerable road users
- P7B – Targeting 60% DSI reduction within current budget

The Do Minimum (base case), i.e. the current situation, is also examined in later sections. This is not listed as a programme but represents the current strategy and programme of intervention into road safety.

Figure 6-4: Summary of Programmes

| Road Safety PBC Programmes Summary | | | | | | | | | | | | | |
|------------------------------------|--|---------------------------|---------------------------------------|--|---|---------------------------|--|--------------------------------|-----------------------------|-------------------------------------|---|---|--|
| | PROGRAMME | P0 | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P4B | P9 | P10 | P7B |
| | | Do Min (3 year Programme) | 3 year Programme extended to 10 years | Focus on high risk areas and highly effective measures | Contribute as much as possible to achieving Vision Zero | Focus on Speed Management | Focus on Transformational Infrastructure | Focus on Vulnerable Road Users | Targeting 60% DSI Reduction | Focus on speed management Version B | Speed management with some infrastructure | Focus on speed management and vulnerable road users | Targeting 60% DSI Reduction, within current budget |
| | APPROX. COST | - | Low-Med | Med-High | High | Med | Med-High | Low | Med-High | Med-High | Med-High | Med | Med |
| PROGRAMME STRATEGIES | Policy & Leadership (including speed limit changes) | | | | | | | | | | | | |
| | Engagement and Education | | | | | | | | | | | | |
| | Travel Demand Management | | | | | | | | | | | | |
| | Enforcement | | | | | | | | | | | | |
| INFRASTRUCTURE INTERVENTIONS | Speed Management | | | | | | | | | | | | |
| | Pedestrian Infrastructure | | | | | | | | | | | | |
| | Cycle Infrastructure | | | | | | | | | | | | |
| | Motorcycle Infrastructure | | | | | | | | | | | | |
| | Intersection Improvements | | | | | | | | | | | | |
| | Corridor Improvements | | | | | | | | | | | | |

*The bars represent level of effort not investment levels.

6.7 DEVELOPMENT OF THE LONG LIST OF PROGRAMMES

The long list of programmes was then developed further to provide more information for the assessment. For each programme:

1. The theme definition was expanded to provide a more thorough description of the thinking behind the programme,
2. The locations where the intervention would be most effective (at the stated intervention level) were identified to show where and how the interventions would be applied.
3. For the application determined above, the reduction in DSI was assessed and the potential range of cost to implement the programme was estimated. The estimates of cost and DSI reduction are both indicative only, given the lack of site-specific development of the interventions at this PBC stage of the project.











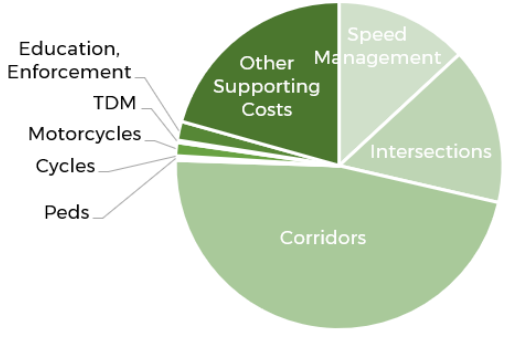
The summary description of each programme is given in the tables below.

PROGRAMME DESCRIPTIONS

| PROGRAMME 0 – Do Minimum (base case) | | Av. 550 DSI per year | <\$10M per year |
|--|--|----------------------------|-----------------|
| <p>This programme is assumed to be the current level of intervention against road safety in Auckland. It is taken as the programme up until but not including 2018, when a significant increase in funding was made available for road safety intervention in Auckland. To best assess the Do Minimum, it was important to consider the situation when the PBC was first commissioned. The programme of intervention largely consisted of low cost and low risk interventions, costing less than \$1 million, and as such, these were also typically reactive solutions.</p> | | | |
| PROGRAMME 1- 3-year Programme extended to 10 years | | DSI ↓ 35-45% | \$550M-\$700M |
| <p>Description: This programme continues the current investment philosophy of the year 1 and year 3 programmes and returns minor safety improvement (mitigation) by end of decade. This requires a heavier level of investment in engagement and education and speed management and lower levels of infrastructure types investments.</p> | | | |
| Intervention Effort | Application | Estimated Cost and Profile | |
| <ul style="list-style-type: none"> Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 16% Speed Management 24% on Minor Safety (reactive safety) 29% High risk urban corridors and intersections 18% High risk urban corridors and intersections 13% safer communities | | |











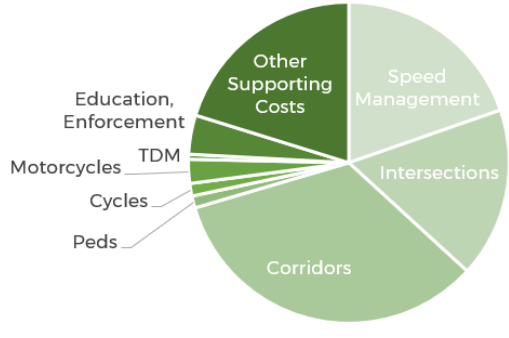
PROGRAMME 2 - Focus on high risk areas and highly effective measures DSI ↓ 45-55% \$1.2B-\$1.7B

Description: Target highest risk locations and employ most cost-effective measures in DSI reduction, including increased investment for vulnerable road users

| Intervention Effort | Application | Estimated Cost and Profile |
|--|---|--|
| Policy & Leadership  Engagement and Education  Travel Demand Management  Enforcement  Speed Management  Pedestrian Infrastructure  Cycle Infrastructure  Motorcycle Infrastructure  Intersection Improvements  Corridor Improvements  | <ul style="list-style-type: none"> 1,900 km of speed management 100 intersections and 370 km of corridors upgraded 15km of pedestrian and 10km of cycle infrastructure 20km of medium motorcycle infrastructure |  |











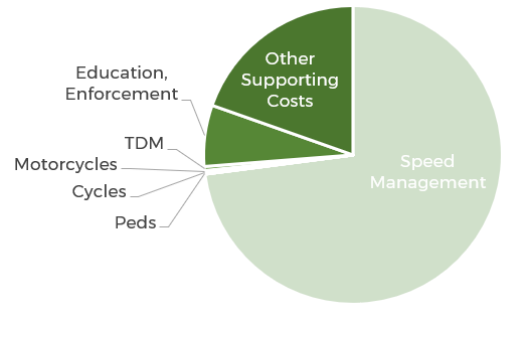
PROGRAMME 3 - Contribute as much as possible to achieving Vision Zero DSI ↓ 75-85% \$1.5B-\$2.2BM

Description: Increase investment across all interventions to eliminate deaths & serious injuries as soon as possible

| Intervention Effort | Application | Cost Profile |
|--|--|--|
| Policy & Leadership  Engagement and Education  Travel Demand Management  Enforcement  Speed Management  Pedestrian Infrastructure  Cycle Infrastructure  Motorcycle Infrastructure  Intersection Improvements  Corridor Improvements  | <ul style="list-style-type: none"> 2,800 km of speed management 200 intersections upgraded 1,190 km of corridors upgraded 30km of pedestrian 25km of cycle infrastructure 50km of high motorcycle infrastructure |  |

PROGRAMME 4 - Focus on Speed Management DSI ↓ 40-50% \$660M-\$860M

Description: If we focused on lowering speeds through speed management interventions only could we substantially reduce DSI's. A value for money option.

| Intervention Effort | Application | Cost Profile |
|--|--|--|
| Policy & Leadership  Engagement and Education  Travel Demand Management  Enforcement  Speed Management  Pedestrian Infrastructure  Cycle Infrastructure  Motorcycle Infrastructure  Intersection Improvements  Corridor Improvements  | <ul style="list-style-type: none"> 3,100 km of speed management 10km of pedestrian infrastructure 10km of cycle infrastructure 20km of low motorcycle infrastructure |  |

PROGRAMME 5 - Focus on Transformational Infrastructure

DSI ↓ 45-55%

\$1.1B-\$1.7B

Description: Investment focus on high risk intersections and corridors, as well as transformational pedestrian and cycle infrastructure

| Intervention Effort | Application | Cost Profile |
|--|--|--------------|
| Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 1,900 km of speed management 200 intersections upgraded 822 km of corridors upgraded 30km of pedestrian infrastructure 25km of cycle infrastructure 20km of low motorcycle infrastructure | |

PROGRAMME 6 - Focus on Vulnerable Road Users

DSI ↓ 35-45%

\$310M-\$450M

Description: Investment focused on safety upgrades for motorcyclists, cyclists, and pedestrians only

| Intervention Effort | Application | Cost Profile |
|--|---|--------------|
| Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 1,900 km of speed management 30km of pedestrian infrastructure 25km of cycle infrastructure 50km of high motorcycle infrastructure | |

PROGRAMME 7 - Targeting 60% DSI Reduction

DSI ↓ 45-55%

\$1.4B-\$2B

Description: Invest across Auckland to achieve at least 60% DSI reduction in 10 years as per RCTP target)

| Intervention Effort | Application | Cost Profile |
|--|--|--------------|
| Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 2,800 km of speed management 180 intersections upgraded 820 km of corridors upgraded 20km of pedestrian infrastructure 15km of cycle infrastructure 20km of motorcycle infrastructure | |

PROGRAMME 9 - Speed management with some infrastructure improvements

DSI ↓ 50-60%

\$620M-\$800M

Description: Investment focused on speed management with more enforcement and demand management

| Intervention Effort | Application | Cost Profile |
|--|---|--------------|
| <ul style="list-style-type: none"> Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 2,800 km of speed management 62 km of corridors upgraded | |

PROGRAMME 10: Focus on speed management and vulnerable road users

DSI ↓ 55-65%

\$510M-\$720M

Description: Lowering speeds through speed management and reducing DSIs for motorcyclists, cyclists, and pedestrians

| Intervention Effort | Application | Cost Profile |
|--|---|--------------|
| <ul style="list-style-type: none"> Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 2,800 km of speed management 20km of pedestrian infrastructure 20km of cycle infrastructure 20km of medium motorcycle infrastructure | |

PROGRAMME 4B: Focus on speed management Version B

DSI ↓ 45-55%

\$800M-\$1B

Description: Lowering speeds through demand and speed management and reducing some DSIs for motorcyclists, cyclists, and pedestrians

| Intervention Effort | Application | Cost Profile |
|--|--|--------------|
| Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 3,100 km of speed management 10km of pedestrian infrastructure 10km of cycle infrastructure 20km of motorcycle infrastructure | |

PROGRAMME 7B: Targeting 60% DSI Reduction, within current budget

DSI ↓ 65-75%

\$1B-\$1.4B

Description: Invest across Auckland to achieve at least 60% DSI reduction in 10 years (mode neutral, as per RLTP target), best DSI return for \$ spend.

| Intervention Effort | Application | Cost Profile |
|--|--|--------------|
| Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements | <ul style="list-style-type: none"> 1,900 km of speed management 100 intersections upgraded 150 km of corridors upgraded 10km of pedestrian infrastructure 10km of cycle infrastructure 10km of cycle infrastructure 20km of motorcycle infrastructure | |

7 PROGRAMME EVALUATION

7.1 SUMMARY OF PROGRAMME EVALUATION PROCESS

The process of programme evaluation was completed in three main stages.

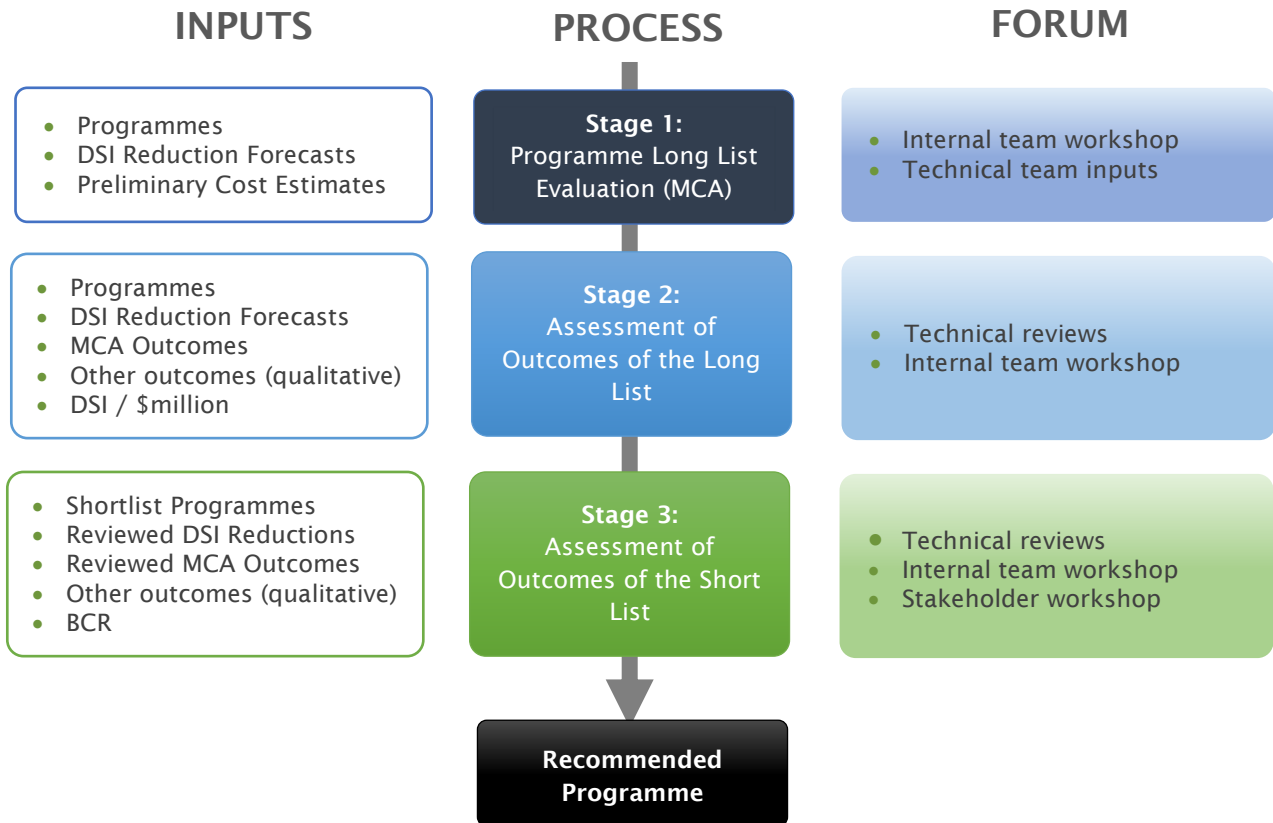


Figure 7-1: Process of programme evaluation

Programme evaluation was based only on the programme details identified in section 6, as such, the evaluation of programmes through multi-criteria was completed at a mostly qualitative level. Estimates of programme outcomes were quantitative in regard to DSI reductions, cost and BCR.

Multi-Criteria Analysis

The evaluation framework used a multi criteria analysis (MCA) approach and involved scoring chosen criteria for each programme. All programmes were scored against the 'Base' Programme (Do Min, current 3 year programme, using several sub-criteria under the following the main criteria

- How well the programme delivers the **investment benefits**
- The **technical complexity and risk** associated with the programme; and
- The **effects** caused by the programme

A detailed description of the MCA is included in Technical note provide in Appendix H.

A significant amount of analysis was undertaken to determine an estimate of forecast DSI reduction per programme. This was used during both programme development and evaluation. Forecast DSI reductions for each programme can be viewed in section 6.7 or Appendix J (Programme Details).

7.2 PROGRAMME LONG LIST EVALUATION

Comparison and Summary of Programmes

A summary of the total MCA assessment for the long list of programmes is provided in Table 7-1. The MCA outputs uses equally weighted criteria groups (33% each) for the base assessment. Several sensitivity tests for a range of alternative scenarios has also been completed. This analysis is provided later in this section.

The weighted overall score for each programme is shown in the table.

Table 7-1: Summary of Multi-Criteria Analysis

| Criteria | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 4B | 9 | 10 | 7B |
|---|---|--|---|---------------------------|--|--------------------------------|-----------------------------|-------------------------------------|---|---|--|
| | Three Year Programme extrapolated to 10 years | Focus on High Risk areas and highly effective measures | Contribute as much as possible to achieving Vision Zero | Focus on Speed Management | Focus on Transformational Infrastructure | Focus on Vulnerable Road Users | Targeting 60% DSI Reduction | Focus on speed management Version B | Speed Management with some infrastructure | Focus on speed management and vulnerable road users | Targeting 60% DSI reduction, but lower cost (budget conscious) |
| Total Score | | | | | | | | | | | |
| Sustained reduction in road deaths & serious injuries (40%) | 1.5 | 1.5 | 3 | 2 | 1.5 | 1.5 | 2.5 | 2 | 2 | 2 | 2.5 |
| Safe and Healthy Streets for Everyone (10%) | 0.5 | 1.5 | 3 | 1.5 | 2 | 2 | 1.5 | 1.5 | 1.5 | 2 | 2 |
| A safer road and street environment (30%) | 1 | 1.5 | 3 | 1.5 | 2 | 1.5 | 2 | 1.5 | 1.5 | 2 | 2 |
| Safe Road User Behaviour (20%) | 0.5 | 1.5 | 3 | 1.5 | 1 | 1.5 | 2.5 | 2.5 | 2 | 3 | 2.5 |
| Delivery Complexity | -1 | -2 | -3 | -1 | -3 | -2 | -2 | -1 | -1 | -2 | -2 |
| Maintainability/operability | -1 | -1 | -3 | -1 | -2 | -1 | -2 | -1 | -1 | -2 | -2 |
| Affordability | 0 | -1 | -3 | 0 | -3 | -1 | -2 | -2 | -2 | -1 | 0 |
| Stakeholders alignment | -1 | -2 | -2 | -1 | -3 | -1 | -2 | -1 | -2 | -1 | 0 |
| Social Impacts (community) | 1 | 1 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 |
| Economic Impacts | 0 | 0 | -2 | -1 | -2 | -1 | -1 | -1 | -1 | -1 | -1 |
| Environmental | -1 | -1 | -1 | -1 | -2 | -1 | -2 | -1 | -1 | -1 | -1 |
| Strategic Alignment | 1 | 1 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 3 | 3 |
| Resilience of the network | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| Public alignment | 0 | 0 | -2 | -1 | 0 | 0 | -1 | -2 | -2 | -1 | 0 |
| Total | 0.21 | 0.11 | 0.19 | 0.48 | -0.38 | 0.21 | 0.19 | 0.16 | 0.04 | 0.45 | 0.70 |
| Rank | 4 | 9 | 6 | 2 | 11 | 4 | 7 | 8 | 10 | 3 | 1 |

The Scoring for components of the MCA is shown below.

Table 7-2: MCA scoring components

| Investment Benefits | | Risks and Complexities | | Effects | |
|---------------------|--------------------|------------------------|--|---------|---|
| 3 | >70% - High | Score | Description | Score | Description |
| 2.50 | 60-70 | 0 | Insignificant risk or complexities | 3 | Significant positive effect |
| 2 | 50-60 | -1 | Standard or routine technical solution | 2 | Moderate positive effect |
| 1.5 | 40-50 | -2 | Some complex element but achievable | 1 | Minor positive effect |
| 1 | 30-40 | -3 | Highly complex, non-standard. Likelihood of significant technical difficult or cost. | 0 | Negligible effect |
| 0.5 | 20-30 | | | -1 | Minor negative effect |
| 0 | <20% - Very Low/Nd | | | -2 | Moderate negative effect |
| | | | | -3 | Significant or appalling negative effect. |

The MCA analysis of the long list of programmes shows that programmes which do not result in significant benefits rank poorly. In addition, programmes with very high risks (such as Programme 5) also ranked poorly. Programmes that sought to deliver strong outcomes within the intended budget ranked and scored the best. Programmes which included more cost-effective measures such as speed management also generally ranked high.

Description of the key MCA findings for each of the programmes

Table 7-3: Key MCA findings

| Programme Number and Description | | Key Evaluation Findings |
|----------------------------------|--|--|
| P1 | Three Year Programme extrapolated to 10 years | <ul style="list-style-type: none"> Worst ranked programme for alignment to the investment benefits Ranked 4th equal overall due to generally low estimated outcomes. |
| P2 | Focus on High Risk areas and highly effective measures | <ul style="list-style-type: none"> 3rd worst ranked programme for alignment to investment benefits Moderate level of risk, as such it did not rank in the top half |
| P3 | Contribute as much as possible to achieving Vision Zero | <ul style="list-style-type: none"> Best programme for alignment to the investment benefits One of the worst programmes in terms of risk and very costly But ranked 6th due to good outcomes |
| P4 | Focus on Speed Management | <ul style="list-style-type: none"> Moderately ranked programme in terms of alignment with the benefits. Overall rank was 2nd |
| P5 | Focus on Transformational Infrastructure | <ul style="list-style-type: none"> Moderately ranked programme in terms of alignment to the benefits One of the worst programmes in terms of risk, particularly for delivery complexity, affordability and stakeholder alignment. Overall ranked the worst at 11th |
| P6 | Focus on Vulnerable Road Users | <ul style="list-style-type: none"> One of the lower ranked options in terms of alignment to the benefits however good affordability is acknowledged Logically ranked at 4th equal – good idea but not strong outcomes. |
| P7 | Targeting 60% DSI Reduction | <ul style="list-style-type: none"> One of the better ranked options in terms of alignment to the benefits, One of the worst programmes in terms of risks as significant physical work was estimated and is quite costly Ranked 7th (indicates why programme 7B was derived). |
| P4B | Focus on speed management Version B | <ul style="list-style-type: none"> Middle ranked option in terms of alignment to the benefits One of the better programmes in terms of risks but low effects As such ranked 8th |
| P9 | Speed Management with some infrastructure | <ul style="list-style-type: none"> Middle ranked option in terms of alignment to the benefits Reasonable risk with low effects (costly for what it delivers) Ranked 10th overall |
| P10 | Focus on speed management and vulnerable road users | <ul style="list-style-type: none"> 3rd best programme in terms of alignment to the benefits Considered to have reasonable risk with moderate effects Due to the good outcomes and balance of risk/effect, ranked 3rd |
| P7B | Targeting 60% DSI reduction, but lower cost (budget conscious) | <ul style="list-style-type: none"> One of the best programmes in terms of alignment to the benefits. Delivers reasonable risks with good effects (affordable) Ranked 1st overall and identified early as preferred programme |

MCA Base Scoring and Sensitivity Testing

The base MCA scoring has been applied as described in Appendix H. with equal weighting applied to each of the three criteria groups: i.e.

- | | |
|------------------------------------|-----|
| • Investment Benefits | 33% |
| • Technical Implement ability/Risk | 33% |
| • Effects | 33% |

A range of sensitivity tests were undertaken to understand the sensitivity of the different criteria in scores and programme ranking. These sensitivity tests were discussed with the stakeholders and more were added. The tests include:

- 1 Doubling the weighting of the Investment Benefit criteria in comparison to other criteria (S1)
- 2 Doubling the weighting of the implementability/risk criteria in comparison to other criteria (S2)
- 3 Doubling the weighting of the Effects criteria in comparison to other criteria (S3)

- 4 Increasing the DSI reduction weighting to 50% within an equally weighted Base system (S4)
- 5 Increasing the DSI reduction weighting to 80% within an equally weighted Base system (S5)
- 6 Increasing the Investment Benefits weighting to 80%, changing Risk to 10% and Effects to 10% (S6)

These sensitivity tests outcomes are shown in Table 7-4. Similarly, Programme 7B is showing as being the number one ranked programme except where Investment Benefits are increased to 80% of the overall assessment in (S6) where Programme 3 (Contributing to Vision Zero) is ranked highest.

Table 7-4: Sensitivity Test Ranking from MCA comparison

| | | Three Year Programme extrapolated to 10 years | Focus on High Risk areas and highly effective | Contribute as much as possible to achieving | Focus on Speed Management | Focus on Transformatio nal Infrastructure | Focus on Vulnerable Road Users | Targeting 60% DSI Reduction | Focus on speed management Version B | Speed Management with some infrastructure | Focus on speed management and | Targeting 60% DSI reduction, but lower cost (budget 7B) |
|--------------------|---------|--|--|--|---------------------------------|--|--------------------------------------|--------------------------------|--|--|--|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 4B | 9 | 10 | |
| 33/33/33 | Base | 4 | 9 | 6 | 2 | 11 | 4 | 7 | 8 | 10 | 3 | 1 |
| 50/25/25 | S1 | 5 | 5 | 8 | 2 | 9 | 5 | 4 | 10 | 10 | 2 | 1 |
| 25/50/25 | S2 | 4 | 7 | 10 | 2 | 11 | 5 | 8 | 6 | 9 | 3 | 1 |
| 25/25/50 | S3 | 7 | 8 | 5 | 2 | 11 | 6 | 4 | 9 | 10 | 3 | 1 |
| 33/33/33 (50% DSI) | S4 | 4 | 9 | 8 | 2 | 11 | 6 | 5 | 7 | 10 | 3 | 1 |
| 33/33/33 (80% DSI) | S5 | 4 | 9 | 8 | 2 | 11 | 6 | 5 | 7 | 10 | 3 | 1 |
| 80/10/10 | S6 | 11 | 9 | 1 | 6 | 10 | 8 | 4 | 5 | 7 | 3 | 2 |
| | Average | 6 | 8 | 7 | 3 | 11 | 6 | 5 | 7 | 9 | 3 | 1 |
| Rank | | 5 | 9 | 7 | 2 | 11 | 6 | 4 | 8 | 10 | 3 | 1 |

The sensitivity testing confirmed that early conclusions in favour of Programme 7B, Programme 10 and Programme 4 were likely to be warranted. Further analysis through estimation of outcomes was required before a short list of programmes could be confirmed.

7.3 SUMMARY OF PROGRAMME OUTCOMES

The results of the MCA analysis were combined in table format with estimates of other programme outcomes to present an additional layer of information. This enabled further appraisal of a potential short list of programmes.

Key outcomes considered at this early stage of analysis included the DSI reduction forecast, and DSI's reduced as a proportion of expenditure. A qualitative assessment of potential mode shift to walking and cycling, population health improvements and customer perceptions were also added. These were based on the historic conversations from various stakeholders regarding the likely impacts of the programmes. Estimates of mode shift were also based on the proposed increases in infrastructure quality as well as intentions around behaviour change programmes.

The summary of outcomes for the long list of programmes is shown in Figure 7-2 and a summary graphic representation of the capital works involved with each programme is presented in Figure 7-3.

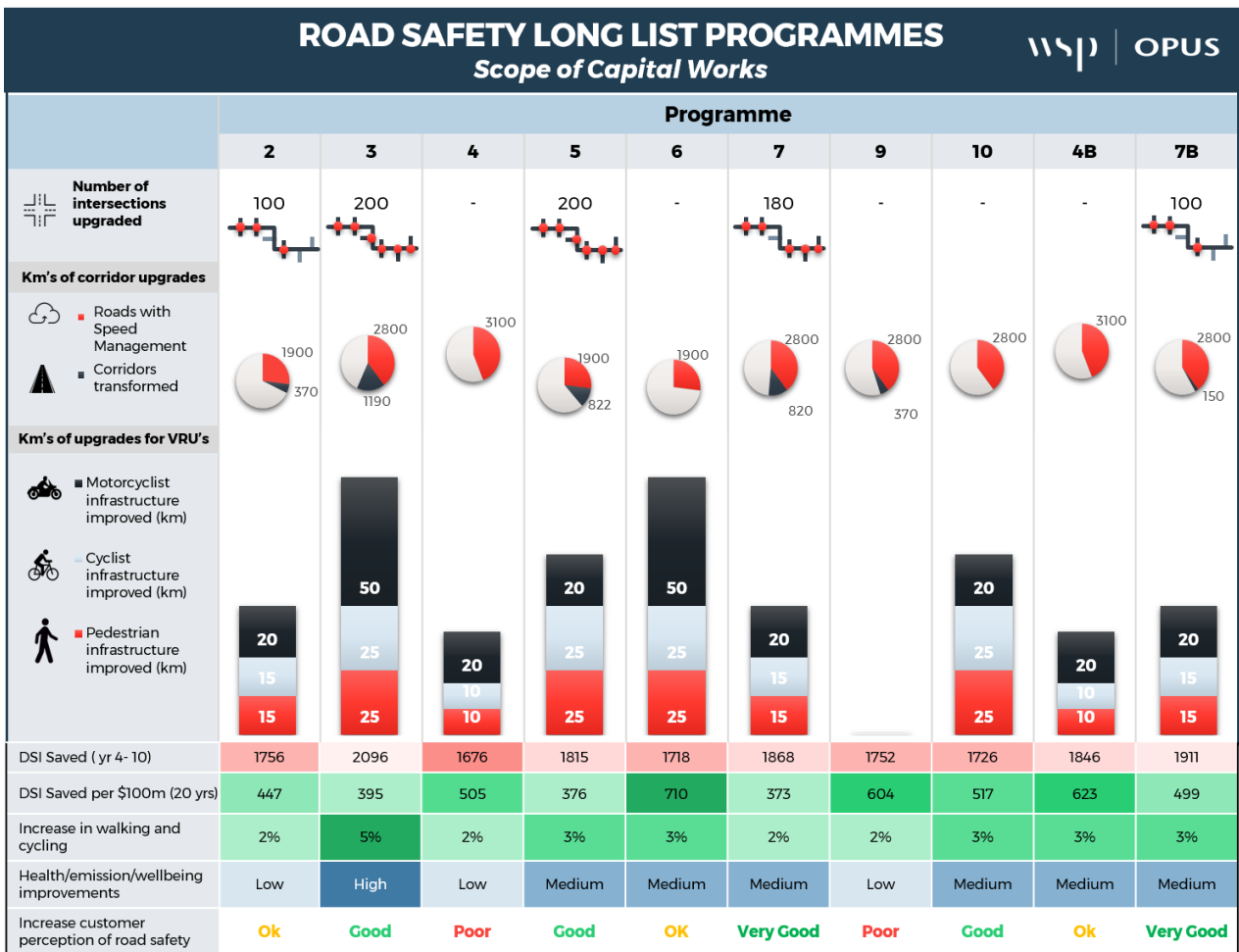
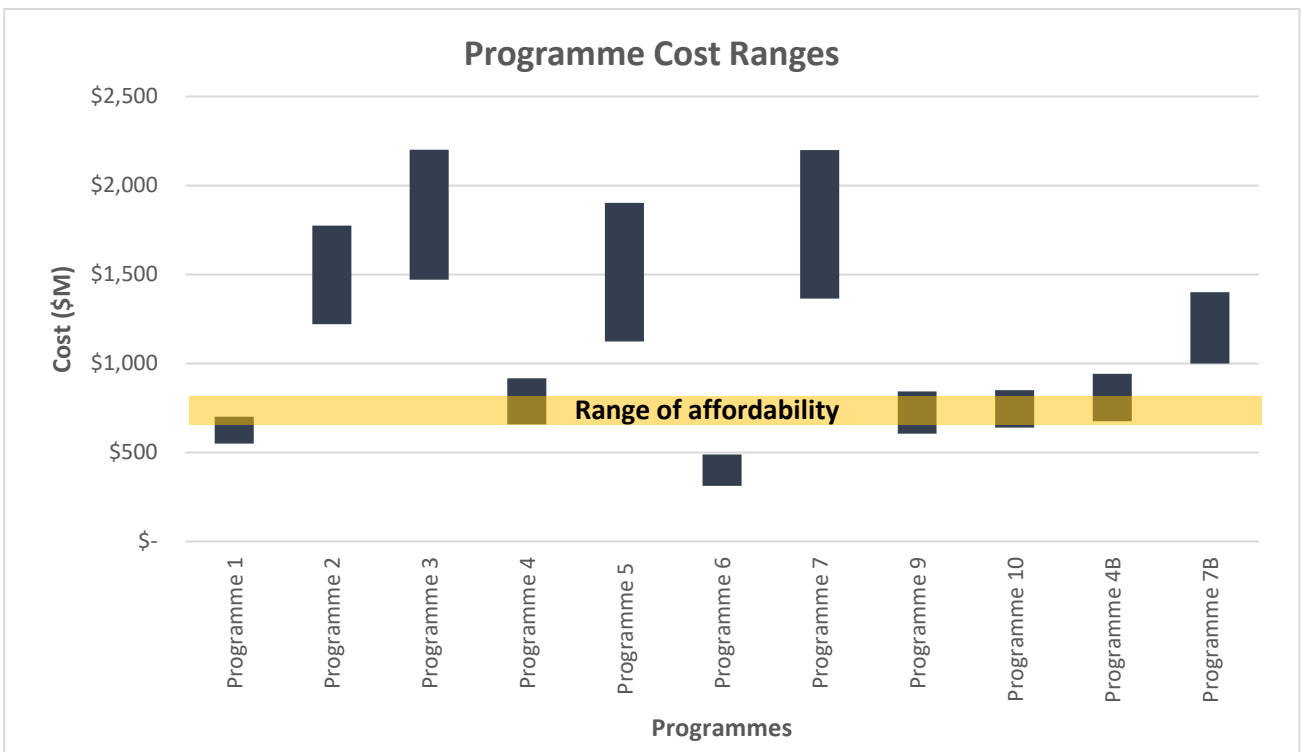


Figure 7-2: Long List Programme Outcomes Summary – preliminary programmes



Note: costs are indicative.

Figure 7-3: Summary of Cost per programme

7.4 LONG LIST TO SHORT LIST

A discussion held with stakeholders at the Programme Short List workshop resulted in a consensus on the programmes to be eliminated and those which would be included in a short list. The elimination of lower performing programmes is shown in Table 7-5 and discussed below.

Table 7-5: MCA Rank, Outcomes and Indicative Short List

| OUTCOMES | PROGRAMMES | | | | | | | | | | |
|--|---|-------------------------------------|---|---------------------------|--|--------------------------------|-----------------------------|-------------------------------------|---|-------------------------------|--|
| | Three Year Programme extrapolated to 10 years | Focus on High Risk areas and highly | Contribute as much as possible to achieving | Focus on Speed Management | Focus on Transformational Infrastructure | Focus on Vulnerable Road Users | Targeting 60% DSI Reduction | Focus on speed management Version B | Speed Management with some infrastructure | Focus on speed management and | Targeting 60% DSI reduction, but lower |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 4B | 9 | 10 | 7B |
| | MCA SUMMARY | | | | | | | | | | |
| Investment Benefit | 0.3 | 0.5 | 1.0 | 0.6 | 0.5 | 0.5 | 0.7 | 0.6 | 0.6 | 0.7 | 0.8 |
| Risks/Complexity | -0.2 | -0.5 | -0.9 | -0.2 | -0.9 | -0.4 | -0.7 | -0.4 | -0.5 | -0.5 | -0.3 |
| Effects | 0.1 | 0.1 | 0.1 | 0.2 | 0.0 | 0.1 | 0.1 | -0.1 | -0.1 | 0.2 | 0.3 |
| MCA Rank | 4 | 9 | 6 | 2 | 11 | 4 | 7 | 8 | 10 | 3 | 1 |
| | OUTCOMES SUMMARY | | | | | | | | | | |
| DSI Saved (yr 4-yr10) | 1426 | 1635 | 2129 | 1509 | 1627 | 1394 | 1869 | 1572 | 1583 | 1798 | 1851 |
| Ratio of DSI Benefits (Yr 4-10) to cost (Undiscounted) | 2.0 | 1.5 | 12 | 1.9 | 1.2 | 3.5 | 1.2 | 1.9 | 2.5 | 2.2 | 1.8 |
| DSI Saved per \$100m spent over 20 yr project life (not bCR) | 587 | 447 | 395 | 505 | 376 | 710 | 373 | 604 | 517 | 623 | 499 |
| DSI Saved per \$100m spent over 20 yr project life - likely Benefits | 10.3 | 5.2 | 4.2 | 6.9 | 5.1 | 12.2 | 4.4 | 5.1 | 5.1 | 9.6 | 9.7 |
| Increase in walking and cycling | <1% | 2% | 5% | 2% | 3% | 3% | 2% | 2% | 3% | 3% | 3% |
| Health/emission/wellbeing improvements | Low | Low | High | Low | Medium | Medium | Medium | Low | Medium | Medium | Medium |
| Increase customer perception of road safety | Ok | Ok | Good | Poor | Good | OK | Very Good | Poor | Good | Ok | Very Good |

Three programmes were consistently ranked high (P4, P10 and P7B) when considering MCA results, quantified DSI outcomes and qualitative outcomes. P10 was considered slightly better performing than P4 due to the better balance of investment and lower stakeholder risks.

In addition, stakeholders felt that the Vision Zero programme (P3) should continue to be considered, as this programme presented the ultimate or aspirational goal for road safety. Despite being currently unaffordable, it was thought that this programme could be achieved over a longer timeframe. Consequently, P4 (although the 2nd ranked option) was discarded in favour of P3. Therefore, the short list of programmes includes:

- P3 – Contribute as much as possible to achieving Vision Zero
- P10 – Focussed on Speed Management and Vulnerable Road Users; and
- P7B – Targeting 60% DSI reduction but budget conscious

7.5 SHORT LIST REFINEMENT AND EVALUATION

Following on from the short list workshop, the three short-listed programmes, P3, P10 and P7B, were re-examined to ensure that:

- P10 and P7B capital costs were reduced to sit within the \$469M RLTP budget for years 4-10 of the road safety programme. The P3 programme was retained to reflect the aspirational nature of this programme.
- Forecast benefits were revised to ensure that they reflected the type and scale of proposed interventions within each programme
- Economic assessments were repeated using the revised programme costs and benefits

The programmes, and their expected costs and benefits were revised as follows:

All Short-Listed Programmes

Costs, value for money discussion, network coverage and resulting benefits for the pedestrian, cycling and motorcycling infrastructure were reviewed. In each case the applicability factors were reduced to better reflect the amount of infrastructure included within each effort level, which reduced the forecast DSI reductions arising from these activities.

Programme 3

Aside from the changes to the DSI forecasts noted above, no other change to programme P3 were made.

The effect on the outcomes was a reduction in the number of DSI saved in 2027 by 11 per year, with the forecast crash reduction reduced from 82% to 80% and the total number of DSI saved reduced from 2366 to 2254. The indicative BCR (based on 20 years of benefits) reduced from 2.1 to 1.9.

Programme 10

- Changes to the DSI forecasts noted above
- Pedestrian and cycle effort level reduced from 3 to 2
- Speed Management at Level 1 coverage reduced by 20%
- Total capex (midrange) cost was reduced to \$470M

The effect on the outcomes was a reduction in the number of DSI saved in 2027 by 8 per year, with the forecast crash reduction reduced from 63% to 61% and the total number of DSI saved reduced from 1809 to 1711. The indicative BCR remained at 3.3.

Programme 7B

- Changes to the DSI forecasts noted above
- Speed Management effort reduced from L3 to L2
- Intersection transformations reduced from 100 to 60
- Corridor transformation reduced from 150km to 34km
- Total cost reduced from \$1.085B to \$604M
- Total capex (midrange) cost was reduced to \$457M

The effect on the outcomes was a reduction in the number of DSI saved in 2027 by 54 per year, with the forecast crash reduction reduced from 72% to 63% and the total number of DSI saved reduced from 2088 to 1766. The indicative BCR is improved from 2.7 to 3.5.

Table 7-6: Revised Short List – Outcomes

| Programme | Cost Range | Cost Mid Point (\$M) | Capex Mid Point (\$M) | % of RLTP Capex Budget | Crash Reduction Range | Forecast annual DSI in 2027 | Decrease from 2017 (690) | DSI Saved (yr1- yr10) | BCR (20 years) | DSI Saved per \$100m |
|--------------|--------------------|----------------------|-----------------------|------------------------|-----------------------|-----------------------------|--------------------------|-----------------------|----------------|----------------------|
| Programme 3 | \$1.3Bn to \$2.2Bn | \$1,764 | \$1,604 | 342% | 75% - 85% | 140 | 80% | 2254 | 1.9 | 358 |
| Programme 10 | \$510M to \$720M | \$617 | \$470 | 100% | 60% - 70% | 270 | 61% | 1711 | 3.3 | 605 |
| Programme 7B | \$460M to \$750M | \$604 | \$457 | 97% | 65% - 75% | 257 | 63% | 1766 | 3.5 | 638 |

Revised Short List – MCA Re-evaluation

The revised short list was re-evaluated against the same criteria as used in assessing the Long List. The following adjustments were considered appropriate to reflect changes to the programmes and the updated assumptions about risks and effects of the programmes.

Performance against objectives: The only changes were to “sustained reduction in road deaths and serious injuries” where the score for P7B was reduced from 2.5 to 2 reflecting the reduction in effectiveness from the lower level of intervention, and to the ‘safe road user behaviour’ objective where the score for P10 was reduced from 3 to 2.5 to differentiate from the more comprehensive P3.

Delivery Risk: Scores for Delivery Complexity were increased by +1 for all programmes (though all remain negative) reflecting that the initiatives included in all programmes do not involve complex engineering activities. The score for affordability was reduced by -1 for P10 bringing it in line with P7B at “0” as these are both within RLTP budget.

Impacts: Scores for economic and environmental impacts for all programmes increased by +1 reflecting expectations that there will be some positive impacts from all programmes including improving access by all modes and improving urban amenity. Scores for strategic alignment decreased by -1 for P3 and P10 reflecting that P3 is far removed from RLTP aspiration and that P10 being highly focussed on speed management focuses predominantly on just one aspect of the safe systems approach. Scores against Resilience of the network reduced by -1 for P10 and P7B as these will provide less resilient improvements than would be expected from P3. Score for Public alignment reduced by -1 for P10 reflecting the potential negative public reaction to very widespread speed management.

Overall, the total scores for all three short list options increased following re-evaluation, by between 0.08 and 0.09. The revised evaluation results are shown in Table 7-7.

Table 7-7: Revised Short List – Re-Evaluation MCA Results

| Short List Evaluation | | 3 | 10 | 7B |
|-----------------------|---|---|---|--|
| Total Score | Criteria | Contribute as much as possible to achieving Vision Zero | Focus on speed management and vulnerable road users | Targeting 60% DSI reduction, but lower cost (budget conscious) |
| | Sustained reduction in road deaths & serious injuries (40%) | 3 | 2 | 2 |
| | Safe and Healthy Streets for Everyone (10%) | 3 | 2 | 2 |
| | A safer road and street environment (30%) | 3 | 2 | 2 |
| | Safe Road User Behaviour (20%) | 3 | 2.5 | 2.5 |
| | Delivery Complexity | -2 | -1 | -1 |
| | Maintainability/operability | -3 | -2 | -2 |
| | Affordability | -3 | 0 | 0 |
| | Stakeholders alignment | -2 | -1 | 0 |
| | Social Impacts (community) | 3 | 2 | 2 |
| | Economic Impacts | -1 | 0 | 0 |
| | Environmental | -1 | 0 | 0 |
| | Strategic Alignment | 1 | 2 | 3 |
| | Resilience of the network | 2 | 1 | 1 |
| | Public alignment | -2 | -2 | 0 |
| | Total | 0.28 | 0.53 | 0.78 |
| | Rank | 3 | 2 | 1 |

Sensitivity testing of the revised short list options was repeated and showed a similar result to the sensitivity testing of the long list options, with option 7B performing best, option 10 second and Option 3 the lowest, in all but the test which gives an 80% weighting to performance against objectives, when Option 3 scores the highest.

7.6 RECOMMENDED PROGRAMME IDENTIFICATION

In response to the information above and following a workshop with key stakeholders, it was agreed that the revised Programme 7B be identified as the recommended programme.

8 PREFERRED PROGRAMME

8.1 SCOPE

The preferred programme contains a combination of investment in infrastructure and non-infrastructure responses to the problem of increased DSI on Auckland’s roads. The expected (midpoint) total cost of the Programme is \$604M (over years 4-10 of the RLTP), an average expenditure per year of \$86M.

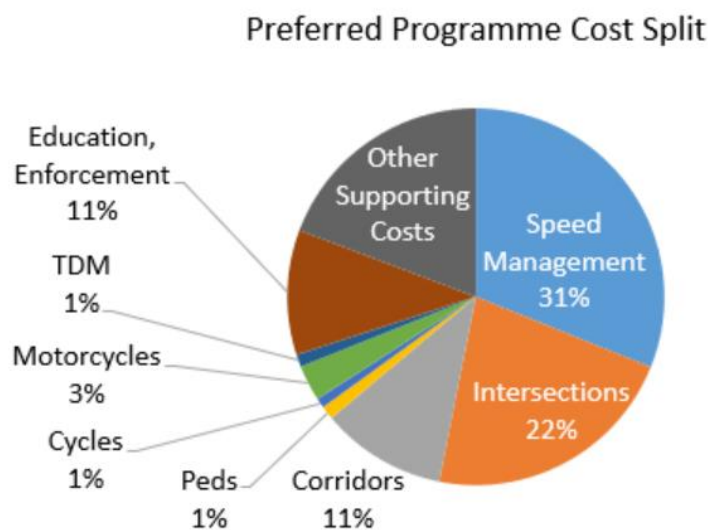
The Capex Component totals \$457, equating to an average expenditure of \$65M per year. This includes the following elements:

- Speed Management: \$193M, covers 1,900 km including 1,100km urban LATM and 220km rural engineering treatments
- High Risk Intersections: \$120M, transforms 60 intersections
- High Risk Corridors: \$68M, transforms 34 km
- Vulnerable road users and TDM: \$35M includes targeted pedestrian, cyclist and motorcyclist infrastructure.

In addition, there are operational expenditure components as follows:

- Enforcement total expenditure \$45M, or \$6.5M per year. This includes both additional road policing (approx. 20 additional FTE) and technology (speed and red light cameras including monitoring). Policing is additional to current enforcement levels and under current arrangements this would be funded by NZ Transport Agency and delivered by NZ Police.
- Education \$22M total, \$3m per year. This is expected to be AT’s share of co-ordinated education and awareness campaigns along with its road safety partner organisations (Note this is increased expenditure on top of current education programme).
- Policy \$8.5M. This is expected to be AT’s share of co-ordinated policy and regulatory interventions along with its road safety partner organisations
- Operations \$113M. This includes some capex (land, fees) and some opex (monitoring, maintenance)

The split of costs between these activities is illustrated on Figure 8-1.



Note: costs are indicative.

Figure 8-1: Preferred Programme – Overall Cost Split

8.2 PROGRAMME OUTCOMES

The recommended programme has been assessed against the ability to deliver against the project objectives (or the four Benefits of Investment – section 5.5) and the key outcomes expected from the programme. The assessment is summarised on Figure 8-2.

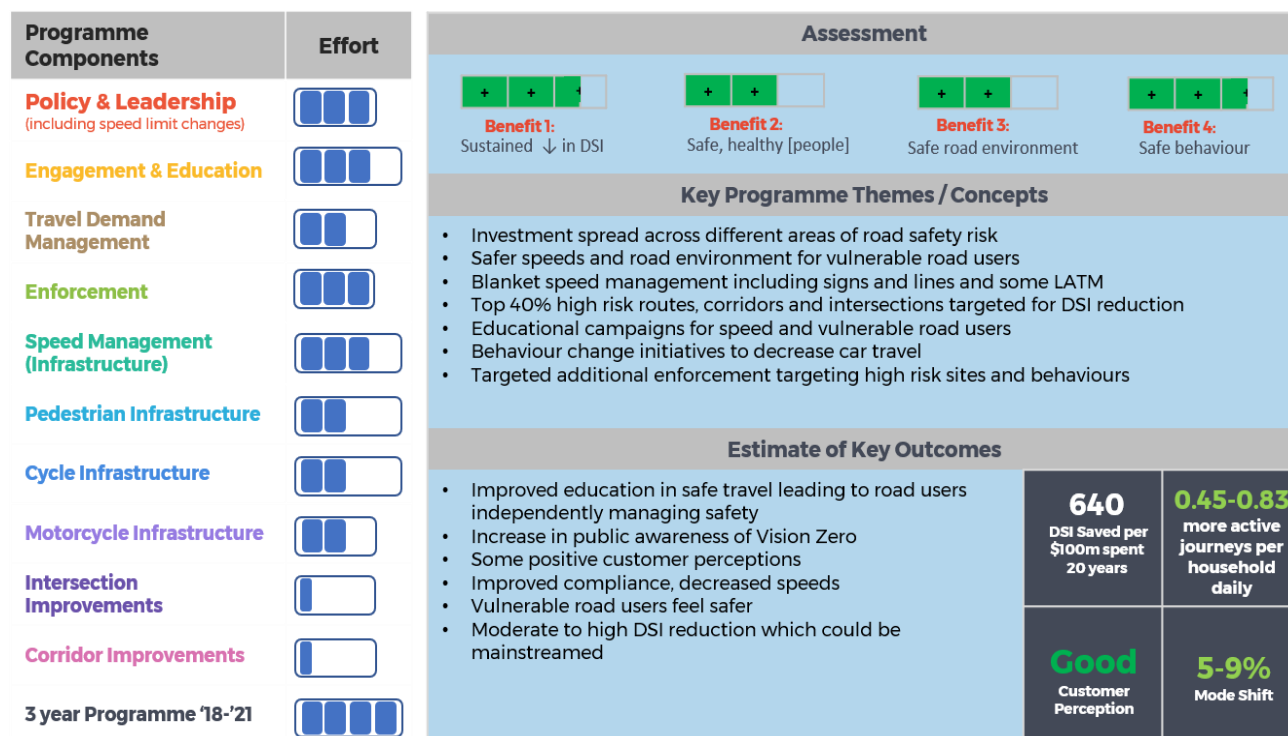


Figure 8-2: Preferred Programme – Assessment Summary

8.3 PROGRAMME RISKS AND OPPORTUNITIES

Risks and Opportunities Associated with Implementing the Programme

Table 8-1 provides details on the major risks associated with delivering the planned programme. These are related to delivering both infrastructure components and complementary initiatives. The table also summarises how risks have been addressed to date, in the development of the PBC. The full list of risks can be found in Appendix K.

Table 8-1 Risks associated with implementing the programme

| Risk | Description | Risk Mitigation included in this PBC |
|---|---|---|
| Infrastructure construction risks | | |
| General cost inflation for civil construction | Cost inflation will drive up the cost of delivering infrastructure elements, limiting the amount of the programme that can be delivered for a fixed budget. | Cost rates used to develop programme use conservative (high) cost rates drawn from recent projects in Auckland. |
| Financial risks | | |
| Availability of AT funding in the context of other transport priorities | Shifts in priorities for funding or limitations on available funds may mean funding levels in this PBC will not be provided for safety. | Recommended programme revised to ensure fits within RLTP programme budget |

| | | |
|--|---|---|
| | | Funding for safety to be top priority reinforced through policy and leadership response. |
| Stakeholder/ public risks | | |
| A change in Government or regional priorities | Funding priorities for road safety may change and the programme can not deliver what is promised | All the strategies – both central and local government have Long term Vision Zero goals which are unlikely to change |
| Complementary Initiatives Risks | | |
| Enforcement level increase cannot be delivered by Police | Police are unable to recruit and train sufficient additional road policing staff to deliver the increased enforcement component of the recommended programme | Sensitivity testing has included removing the costs and benefits of additional enforcement for the recommended programme. |
| Policy Initiatives | The expected benefits arising from policy initiatives may not be delivered as a result of lack of urgency from decision makers, political interference or external issues | Sensitivity testing has included removing the costs and benefits of policy initiatives for the recommended programme. |
| Opportunities | | |
| Benefits Realisation | Opportunity to develop continuous improvement loops to improve processes and deliver on outcomes | Noted in the Management Case |

Risks and Opportunities associated with achieving programme outcomes

Table 8-2: shows identified risks and opportunities for achieving the desired benefits and achieving the investment objectives of the programme. The full list of risks can be found in Appendix K.

Table 8-2: Risks associated with achieving programme outcome

| Risk | Description | Risk Mitigation included in this PBC |
|---|--|--|
| DSI Savings risks | | |
| Predicted levels of DSI reduction | Predicted levels of DSI reduction may not be achieved by the recommended programme | Forecast DSI reductions are evidence-based referencing a range of NZ and international studies into effectiveness of various intervention types. |
| Other Outcome Risks | | |
| Programme fails to deliver a safe roadside and street environment | Safe roadsides are typically a rural road issue and treating the entire rural road network roadsides would be uneconomic. Safe street environments is similar to the above in terms of risk and mitigation. | Recommended programme speed management component includes treating 220 km (10%) of rural network with wider shoulders. |
| Programme fails to deliver safe road user behaviour | The targeted road user behaviours include speeding, alcohol use, red light running and seat belt compliance. The programme is only able to influence these behaviours rather than guarantee adherence to rules | The recommended programme includes \$45M investment in enforcement, both in terms of increased road policing activity and in technology responses including red light and speed cameras. |

| | | |
|----------------------|---|---|
| | | The programme also includes \$21M investment in education and raising awareness of the need for safe behaviours and consequence of not. |
| Opportunities | | |
| Emerging Technology | Technological advances in vehicle safety such as Intelligent Speed Adaptation could, if widely adopted or mandated, have a significant effect on road safety in Auckland. | Policy component includes for vehicle technology innovations to be explored. |

8.4 VALUE FOR MONEY AND SENSITIVITY ANALYSIS

Economic Analysis of the preferred programme has been completed along the basis of that used for the assessment of the economic performance of options. The only benefits quantified in this analysis are those arising from a reduction in DSI compared with the Do- Minimum option, using NZ Transport Agency published social costs of crashes.

We recognise that other transport benefits – and dis-benefits – are likely to arise from the preferred programme, including:

- Benefits arising from reductions in minor and non-injury crashes
- Benefits arising from mode shift to active modes and public transport, including reduced congestion and wider health benefits from increased activity, reduced emissions.
- Potential dis-benefits arising from increased travel times, noting that the Transport Agency EEM now allows for changes in speed limits to be included within the Do-Minimum for safety projects

Economic Analysis of individual sub-programmes, packages or projects that will arise from this PBC will be required to assess their economic efficiency to gain Transport Agency funding. At that stage it may be possible to quantify some of the other benefits and dis-benefits noted above, depending upon the expected effects of each project.

The forecast costs and benefits of the proposed programme have been used to produce a benefit:cost ratio (BCR) for the programme. The assumptions used, and details of the analysis is included in Appendix I.

The resulting forecast BCR for the entire 10-year programme using only DSI crash reduction benefits is 4.5.

The first-year rate of return (FYRR) is 20% if assessed upon completion (year 11).

Sensitivity Tests

Sensitivity tests of the BCR have been carried out as summarised on Table 8-3.

Table 8-3: Economic Assessment – Sensitivity Tests

| Sensitivity Test | Resulting BCR |
|--|---------------|
| Base Case | 4.5 |
| Project life reduced from 40 to 20 years | 3.5 |

| Sensitivity Test | Resulting BCR |
|--|---------------|
| Discount Rate reduced to 4% | 5.3 |
| Discount Rate increased to 8% | 4.0 |
| Delay Capital Implementation by 15 years | 4.7 |
| Exclude the "Enforcement" component | 4.2 |
| Exclude the "Policy" component | 4.3 |
| Exclude both the "Enforcement" and "Policy" components | 3.9 |

The sensitivity testing demonstrates that the BCR would be affected by any of these scenarios, but in no case does the BCR drop beneath 3.5 and as such the efficiency of the programme is considered robust.

8.5 ASSESSMENT PROFILE

Predicted Results Alignment

The assessment considers all criteria for results alignment and cost benefit according to the NZ Transport Agency’s Investment Assessment Framework (IAF) for the 2018-2021 NLTF programme⁹.

The Investment Assessment would consider two factors:

- Results alignment (section 4.7.1)
- Cost Benefit Appraisal (not required)
- BCR included

The two assessment factors are brought together to form an assessment profile that determines the proposal’s priority within the NLTF (assessed by NZ Transport Agency).

This programme generally sits within several activity categories and seeks to contribute to planned land transport investment over a wide area. As such, it is more likely to fit into the “Investment Management” category which only requires a results alignment assessment. The activities within this programme would have to go through a process of prioritisation and funding approval, and requiring a BCR at an activity-level (i.e. projects). The programme also covers “Promotion of road safety and demand management” which typically comprises of low cost (including minor infrastructure) and low risk activities not requiring BCR assessment, and some components which would be “Road Policing” which is assessed at a programme level.

Criteria for results alignment

The results alignment is an assessment of investment proposals against the outcomes sought from the GPS. Regarding this PBC, the outcomes are mainly safety, however access and environment are also considered. The question that needs to be asked when assessing the results alignment of the programme are: What is the significance of the case for change to the desired results in the GPS (is it in the public interest)?

This PBC spans multiple activity classes under the framework and alignment for them is shown below:

Table 8-4: Results Alignment Investment Assessment Framework

| ACTIVITY CLASS | GPS PRIORITY | ALIGNMENT |
|--|---|---|
| Public transport, rapid transit and transitional rail improvements | Safety – a safe transport system free of death and serious injury | Very High – addresses a very high predicted safety risk resulting from public transport Programme 7B addresses road safety for Public transport users with pedestrian and speed management measures |
| Promotion of road safety and demand management | Safety – a safe transport system free of death and serious injury | Very High – promotes the implementation of an approved speed management approach focused on treating the top 10 percent of the network that will result in the greatest reduction in DSI |

⁹ <https://www.nzta.govt.nz/assets/planning-and-investment/nltp/IAF-for-GPS-2018.pdf>

| ACTIVITY CLASS | GPS PRIORITY | ALIGNMENT |
|---|--|---|
| | | <p>Promotes changes made to safety regulation that address one of the high priority safety areas</p> <p>Programme 7B promotes road safety through treating the highest risk areas of the corridor, and supports Road Policing enforcement of high-risk behaviours</p> |
| Walking and cycling improvements | Safety – a safe transport system free of death and serious injury | <p>Very High – addresses a very high predicted walking or cycling safety risk.</p> <p>Programme 7B invests in vulnerable road users such as pedestrians and cyclists</p> |
| | Environment – reduce adverse effects on the climate, local environment and public health | <p>High – enables a significant modal shift from private motor vehicles to active modes</p> <p>There is a modal shift expected as part of Programme 7B.</p> |
| | Access to opportunities, enables transport choice and access, and is resilient - liveable cities | <p>High – supports increasing the uptake of children using walking and cycling especially to and from school</p> <p>Programme 7B provides support for walking and cycling through engagement</p> |
| Regional, local road and state highway improvements | Safety – a safe transport system free of death and serious injury | <p>Very High – implements a speed management approach focusing on treating the top 10 percent of the network that will result in the greatest reduction in DSI targeting areas of high collective risk with high DSI reduction measures that achieve a DSI reduction of at least 40%</p> <p>Programme 7B invests \$68M in high risk corridor improvements and \$120M in High risk intersection improvements</p> |
| Road policing programme | Safety – a safe transport system free of death and serious injury | <p>Very High – supports implementation of the Speed Management Guide</p> <p>Targets activities to address driving at unsafe speeds, driver impairment, distraction, and licensing compliance</p> |

| ACTIVITY CLASS | GPS PRIORITY | ALIGNMENT |
|-----------------------|---|--|
| | | Programme 7B invests \$45M in enforcement |
| Investment management | Safety – a safe transport system free of death and serious injury | High – considers approaches to addressing safety issues in areas identified as being of high predicted crash risk Programme 7B invests \$68M in high risk corridor improvements and \$120M in High risk intersection improvements |

The Results Alignment for Auckland’s Road Safety Programme is estimated to be Very High, as a result of the alignment with the priorities of the activity classes above.

The following table defines the general criteria for assessment of the project. In general, the gaps refer to the relevant levels of service according to the activity class of the programme.

| GPS PRIORITY | LOW | MEDIUM | HIGH | VERY HIGH |
|---------------------------|---|--|--|--|
| Safety | Continuous programmes: a higher level of service than required Improvements: a gap in required levels of service | Continuous programmes: a fit-for-purpose level of service Improvements: an identified gap of some significance in required levels of services | Continuous programmes: a gap in existing levels of service Improvements: a significant gap in a targeted regional or national context | Directly link to specific priority results sought in the GPS |
| Access – thriving regions | | | | |
| Access – liveable cities | | | | |
| Environment | | | | |

Benefit and cost appraisal: M

The programme is assessed as having a medium economic efficiency, based on an expected BCR of 4.5 within a range of 2.8 to 5.3.

Substantial additional benefits in terms of mode shift and wider health benefits, and potential dis-benefits in terms of effects on vehicle travel times are expected to arise from this programme as discussed in section 8.4 which have not been included within the reported BCR.

In summary, the programme provides a Very High Results alignment with Medium BCR which equates to a Priority 1 Funding Profile.

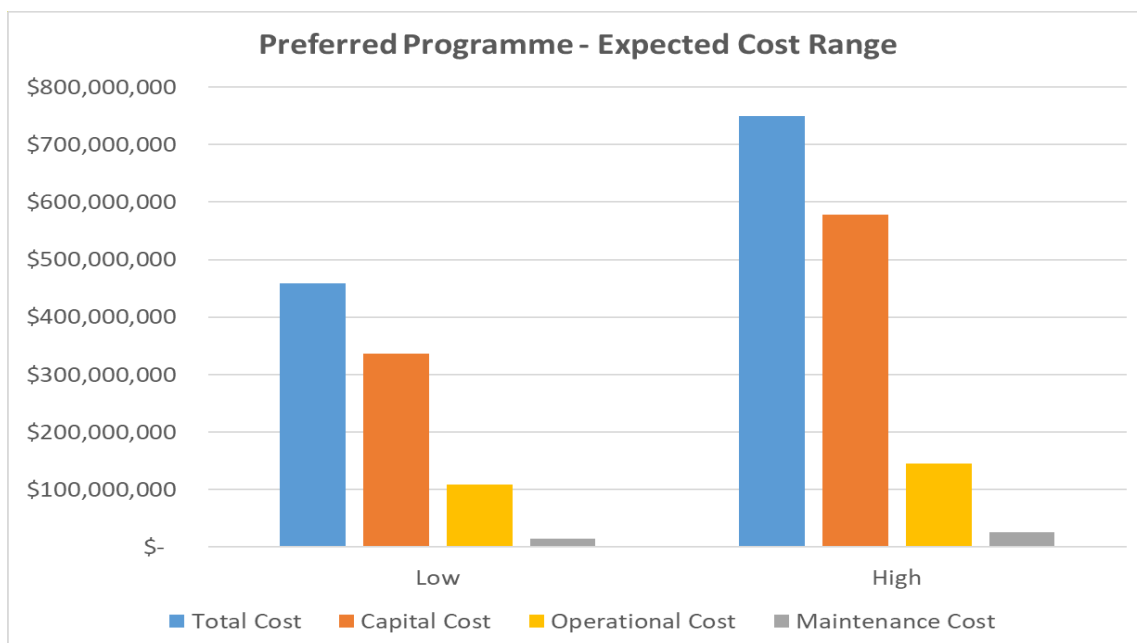
9 FINANCIAL CASE

This section highlights the affordability of the programme, and what elements are to be funded by the partnering organisations

9.1 INDICATIVE COST

The total indicative cost of the programme over the 2021 - 28 period is a \$604M package made up of \$457M of infrastructure improvements, and supported by \$147M of operational and maintenance costs.

These are midrange “expected” costs, with the forecast range of total costs between \$460M and \$750M are shown on Figure 9-1.



Note: costs are indicative. OPEX costs require further analysis at a later stage.

Figure 9-1: Preferred Programme – Expected Cost Range

Costs derived for the recommended programme have been allocated to indicative programme areas (such as pedestrian infrastructure, cycling infrastructure etc.), however may be re-allocated within broader categories such as “Vulnerable road user infrastructure” if the needs between different road users change over time. In addition, the actual budgets for each of these areas would need to be confirmed once the detailed programme is confirmed.

Cost of Infrastructure

The cost of infrastructure improvement components of the recommended programme is estimated at \$478 million over the 2021-2028 period. It is recommended that this expenditure is evenly phased over the seven-year programme period (i.e. 10 – 3yr). However, the exact phasing will be determined during the construction planning phase which occurs after the development of the PBC.

During programme development, indicative standard cost rates were established for the types of interventions within the programme to understand the extent of network development that this level of investment may enable. The cost rates were established with reference to costs for recent projects constructed in Auckland with advice from Auckland Transport. For each component, “low”

and ‘high’ values were identified from a range of per kilometre cost rates observed across multiple projects. The cost rates used in the BCR are the average of the low and high costs in 2018 terms, with no allowance made for future cost escalation.

Table 9-1: summarises the standard cost rates and the length of different facility types within the recommended programme. Actual facility costs and length of network enabled by the investment will depend on detailed design and location considerations. These costs exclude land and fees which are captured under “other costs”.

Table 9-1: Infrastructure Indicative Construction Costs (excludes land)

| Infrastructure Response (Typical) | Cost rate \$/100m or Per intersection | | | Expected Total Cost | Length (km) / No in programme |
|--|---------------------------------------|-----------|-----------|---------------------|-------------------------------|
| | Low | High | Mid | | |
| Speed Management Level 1 signs and lines | \$1,000 | \$5,000 | \$3,000 | \$193M | 586km |
| Speed Management Level 2 Urban LATM | \$2,000 | \$10,000 | \$6,000 | | 1107km |
| Speed Management Level 2 Rural – wide shoulders and active signs | \$38,625 | \$60,000 | \$49,312 | | 221km |
| Intersection Transformation | \$0.5M | \$3.5M | \$2M | \$120M | 60 no |
| Corridor - Transformation | \$150,000 | \$250,000 | \$200,000 | \$68M | 34km |
| Pedestrians Level 1 signs and lines | \$5,000 | \$10,000 | \$7,500 | \$35M | 10km* |
| Pedestrians Level 2 better infrastructure | \$10,000 | \$100,000 | \$55,000 | | 10km* |
| Cyclists Level 1 signs and lines | \$5,000 | \$10,000 | \$7,500 | | 10km* |
| Cyclists Level 2 better infrastructure | \$5,000 | \$70,000 | \$37,500 | | 10km* |
| Motorcycle L2 | \$40,000 | \$140,500 | \$90,250 | | 20km* |
| Consent Monitoring (5%) | - | - | - | \$21M | - |
| Contractor MSQA (4%) | - | - | - | \$16M | - |
| Detailed Design (6%) | - | - | - | \$25M | - |
| Total | | | | \$478M | |

Note: these are indicative cost breakdowns and would be revised in the next iteration of the business case.

The relatively high cost of treating high risk intersections compared to the forecast DSI reduction is directly related to the high variability in the cost of transforming intersections in Auckland. We estimated a cost range for the average intersection transformation of between \$0.5 and \$3.5 Million, with an average of \$2 Million. This accounts for the likelihood that some intersection transformations will be substantially more than \$3.5 Million, but spread over 60 intersections, the average is likely to fall within this range.

Cost of complementary initiatives

Complementary initiatives, being Travel Demand Management, Enforcement, Education and Policy inputs into safe road user behaviour and the safe vehicles area are an important part of the recommended programme and deliver about 40% of the benefits. The estimated costs have been derived from consideration of the current expenditure and from other studies, with no allowance made for future cost escalation. The estimated cost ranges and total expenditure for each complementary activity is shown on Table 9-2.

Table 9-2: Costs of Complementary Activities

| Initiative | Cost | | |
|---|--------------|--------------|----------------|
| | Low | High | Mid |
| Travel Demand Management | \$2M | \$10M | \$6M |
| Enforcement (Additional Police, Safety Cameras) | \$41M | \$50M | \$45.5M |
| Education and Awareness | \$18M | \$25M | \$22M |
| Policy and Regulatory | \$7M | \$10M | \$8.5M |
| Total | \$68M | \$95M | \$20.5M |

Other costs

Other operational costs included within the recommended programme total \$113M. This includes some capex (land, fees) and some opex (monitoring, maintenance) as detailed on Table 9-3:.

Table 9-3: Other Operational Costs

| Other Cost (proportion of construction cost where applicable) | Cost | | |
|---|----------------|-----------------|-----------------|
| | Low | High | Mid |
| Property Costs | \$2M | \$10M | \$6M |
| Monitoring and Evaluation (1%) | \$3.0M | \$5.2M | \$4.1M |
| Maintenance (5%) | \$15.2M | \$25.8M | \$20.5M |
| AT Managed Costs (5%) | \$15.2M | \$25.8M | \$20.5M |
| Total | \$81.0M | \$144.2M | \$112.6M |

Note: these are indicative cost breakdowns and would be revised in the next iteration of the business case.

9.2 FUNDING ARRANGEMENTS

Funding pre-implementation, construction and maintenance of infrastructure improvements

Current Arrangements for funding road network improvements and maintenance involve AT and the National Land Transport Fund (NLTF) co-funding improvements on the local road network, with NLTF funding provided at a general Funding Assistance Rate (FAR) to AT of 51%, with FAR of up to 75% currently available for road safety projects. The 75% FAR has been assumed to be available for this programme (until 2021), any changes to the FAR for safety works over the next 10 years may affect the fundability of the AT share of the programme, potentially requiring a scope reduction.

Funding complementary activities

Current arrangements for funding complementary initiatives includes:

- AT receives NLTF subsidy for provision a programme of promotion, marketing and events, motorcycle/cycle and driver training, and travel behaviour change programmes
- The NLTF (through the road policing activity class) funding NZ police safe road user enforcement.
- The NZ Transport Agency funding road rule awareness and transport safety promotion campaigns.

Complementary initiatives for the 2021 - 2028 programme are proposed to be funded in the same way, continuing current arrangements.

9.3 AFFORDABILITY

The capital expenditure portion of the recommended programme has been refined to fit within the Auckland Transport RLTP 2018-2027 budget expenditure for road safety, so the affordability of the capital expenditure is assumed to be acceptable.

Level of funding available from the NLTF (dependent on the government's three yearly GPS and level of funding allocated to the Safety activity class and on NZ Transport Agency NLTP development processes).

PART C – DELIVERING AND MONITORING THE PROGRAMME

10 IMPLEMENTATION

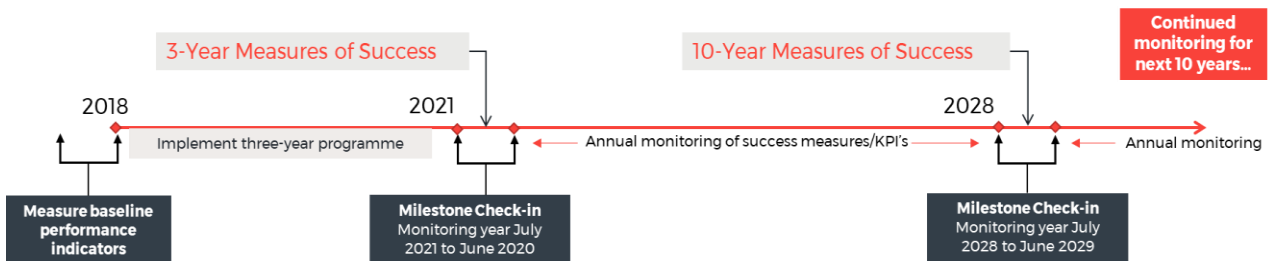
In terms of achieving Vision Zero in Auckland, there are several parties responsible. Auckland Transport’s capital expenditure is only one part of the integrated solution for reducing road casualties in the Region. The Tamaki Makaurau Road Safety Partnership, comprised of various agencies with a stake in road safety, has a shared responsibility for road safety in the region and all partners have a programme of work designed to deliver a safer road system for all users.

11 MONITORING AND EVALUATION

11.1 INTERIM MEASURES OF SUCCESS

It will be important to measure the success of the programme during programme delivery, to understand whether the programme is as effective as predicted and enable AT to adapt or adjust delivery plans or respond to issues as they arise. It is important that the adopted programme can be adjusted to reflect changes in crash type, location and causal factors over the next 10 years.

To track programme success, interim measures of success can be monitored. Monitoring could be complete annually or at time intervals aligned with delivery of components within the programme.



Examples of types of interim measures of success were researched through other Auckland Programmes of intervention, and international best practice.

Suggestions for performance measures and potential targets are shown in Table 12-1. Further details on monitoring and evaluation are presented in the Monitoring and Evaluation Technical Note (December 2018).

Table 11-1: Proposed performance measures

| |
|--|
| Over-arching Performance Measure |
| Sustained reduction in road deaths and serious injuries by mode – target is 60% reduction in DSI over 10 years |

| Ongoing Monitoring | End of 3-Year Programme | End of 10-year programme | Other recommended measures |
|---|--|--|---|
| Annual DSI's ¹ | DSI's by area ¹ | Total DSI ¹ | Increased PT and active mode use from 16% (Journey to work mode share 2013) to at least 21% by 2028. |
| Compliance with speed limits | DSI by Vulnerable Road User | DSI's by area ¹ | |
| Compliance with road rules ⁵ | Proportion of the road network where speed limits are adjusted to Safe & Appropriate Speeds. | DSI by Vulnerable Road User | AT participation in active modes safety and mode shift initiatives |
| Drivers detected using or above limits for illicit substances (drugs, alcohol) | Increase the proportion of vehicles surveyed travelling within posted speed limits. | Proportion of the road network where speed limits are adjusted to align with Safe & Appropriate Speeds – target is 60% by 2028. | Proportion of high risk network, including intersections, covered by automated safety enforcement |
| Drivers detected using cellphone while driving | Mean travel speeds around schools – proportion which are 30 km/hr or lower during school activity. | Increase the proportion of vehicles surveyed travelling within posted speed limits – target is XX% by 2028. | Community understanding and support for speed management |
| Monitor near misses/crashes project implementation – Automated Conflict Analysis ² | Proportion of Cycle Network which provides safe infrastructure – kilometres of protected cycle facilities. | Proportion of Cycle Network which provides safe infrastructure – kilometres of protected cycle facilities. | Proportion of Tamaki Makaurau Road Safety Group members and key providers who have robust Health & Safety plans in place that recognise Vision Zero and include criteria around safe vehicle use and transport practices. |
| Cycle counts at counter locations ⁴ | Cycle counts on existing cycle trunk paths ⁴ | Cycle counts on all key cycle routes ⁴ | |
| Walk Scores / walk LOS audits | Increasing VKT on rural network through infrastructure which is Safe System Primary and Supporting Treatments | Increasing VKT on rural network through infrastructure which is Safe System Primary and Supporting Treatments | Other potential measures |
| | Increasing VKT on Vision Zero/Safe System compliant corridors and intersections in urban network, including walking, cycling and motorcycles | Increasing VKT on Vision Zero/Safe System compliant corridors and intersections in urban network, including walking, cycling and motorcycles | Hospitalisations due to crashes or road incidents |
| | Number of pedestrian crossings which meet Safe System standards (e.g. raised, zebra) including near schools | Number of pedestrian crossings which meet Safe System standards (e.g. raised, zebra) including near schools | DHB data: rates of obesity |

| | | | |
|--|---|--|---|
| | Safety of active mode journeys around public transport nodes | Safety of active mode journeys around public transport nodes | DHB data: cardio-metabolic risk factors |
| | Customer Experience surveys - community perceptions of road safety risks and speed management | Customer feedback on mode choice, speed management & safety | Emissions decreases (contribution) |

While this business case does not include road safety initiatives outside the Safety-specific CAPEX programme, road safety benefits may be achieved across other Auckland Transport programmes. The transport investment that Auckland Transport delivers through Maintenance and Other Capital Projects will also deliver safety benefits and should also be monitored for this reason. In particular, leadership and policy changes, as well as training delivered within the organisation will result in increased alignment to road safety goals and directions across departments.

12 THE MANAGEMENT CASE

12.1 PROGRAMME GOVERNANCE AND DELIVERY

This programme of investment is a partnership between NZTA and Auckland Transport. Both have roles to play in planning, funding and delivering components of the recommended programme. The programme has interactions across a number of divisions within AT including Safety, Network Management, Integrated Networks and Planning and Investment. Successful governance and delivery of the programme also requires successful collaboration between partners in particular with NZTA, NZ Police and Auckland Council which has evolved through the development of the PBC and maintained through interactions at the Auckland Transport led Tāmaki Makaurau Road Safety Governance Group (TMRSGG).

12.1.1 PBC Governance across Tamaki Makaurau Partners - Tamaki Makaurau Road Safety Governance Group

The TMRSGG is a strategic road safety group that:

- Provides inspirational road safety leadership across Auckland using a Vision Zero/Safe System approach, and is the road safety voice on behalf of the region, publicly raising the profile of road safety
- Oversees and drives safe system training and thinking in their own organisations for Board, executives, management and staff. Members drive road safety implementation in their respective organisations in culture and policy
- Actively manages the achievement of the Vision and Targets to be developed in the Auckland Vision Zero Strategy through identifying and realising interventions and evaluating and publicly reporting on performance. This group will oversee delivery, including implementation, monitoring and benefits realisation of the programme. The governance group will hold members to account for the delivery of a system outcome that reduces death and serious injury in accordance with our strategy targets
- Invests in productive working relationships and Vision Zero/Safe System understanding between members, with clear mechanisms for communication, collaboration and accountability
- Actively advocates at a national level for the necessary resources and policies that will improve Auckland road safety performance, including the community, regional partners, central government agencies and elected members.

The TMRSGG has a Terms of Reference which sets out the Vision Zero goal, interim targets and the terms of reference that this partnership will be built on. The Vision Zero/Safe System approach is firmly based on a shared ethical responsibility and the governance and performance indicators sections are based on this principle of a joint commitment to a common goal.

The group is informed by the draft Auckland Vision Zero Strategy (due for completion September 2019), the draft Road to Zero National Road Safety Strategy to 2030, NZ Road Policing Programme (to be replaced by the Tamaki Makaurau Tasking and Coordination document), and revised Auckland Plan. It will be further informed by the AT Road Safety Business Improvement Review, 2018 Road Safety Summit and this Programme Business Case.

The framework includes three key components: Road Safety Governance & Planning, Strategy & Performance Indicators, and Terms of Reference for the Strategic and Operational Auckland groups. These components require the partnership and support of Auckland Transport, NZ Transport Agency, NZ Police, Accident Compensation Corporation, Auckland District Health Board and Auckland Council to be successful.

The Tamaki Makuarau Road Safety Reference Group (TMRSRG) plays a key role in building collaborative two-way communication around community and stakeholder road safety concerns.

The Tāmaki Makaurau Road Safety Leadership Group (TMRSLG) has been involved throughout the development of the PBC and once approved will be a standing item at the TMRSLG meetings whose mandate is to provide direction, problem solve and remove barriers to achieving outcomes.

12.1.2 PBC Governance across Auckland Transport

Auckland Transport will govern many of the components of the programme through the AT Transport Safety Governance Framework which is currently being developed.

AT are also currently further developing its process to develop and deliver a joined-up collaborative and streamlined AT programme approach to the planning, implementation and management of safety projects with emphasis on efficient and effective capital spend and developing management elements over the short, medium and longer term.

Governance and programme requirements include:

- The governance of the overall programme to provide for sound project and programme management disciplines, such that the programme owners can be assured that AT are providing the most appropriate safety interventions, in the correct location at the most optimum time and in the most cost-effective way possible. The programme will be relentless in its quest to deliver the maximum reduction in death and serious injury possible for the available funding.
- In order to achieve this outcome, the governance will make appropriate allowances for ongoing evaluation of the performance of the programme and commensurate adjustment to the pipeline of projects through feedback loops.
- The governance of the programme will demand the application of strong project and programme management disciplines such that measures like \$ per casualty crash saved and safety BCR can be maximised and actually delivered.
- The governance of the programme will provide for the optimisation of treatment and project selection aligned to Vision Zero/Safe System principles.
- The governance of the programme will provide for innovation, to provide value, raise the bar and break down any views of doing things the way we have always done.
- The planning and project development work will be done in a way that maximises the opportunities for the delivery arms in AT to be successful and similarly delivery must be done to maximise the safety benefits. Those delivering must implement good practice in project management disciplines in relation to time, cost, quality and most importantly benefit realisation

The overall programme is broken into 10 components, each having its own programmes, timeframes and governance arrangements. The 10 areas are:

1. Speed management
2. Pedestrian Infrastructure
3. Cycle infrastructure
4. Motorcycle infrastructure
5. Intersection Improvements
6. Corridor Improvements
7. Travel Demand Management
8. Policy, Leadership & Capability

- 9. Engagement and Education
- 10. Enforcement

Currently the programme components are governed through the divisions outlined in 12.1.3 below.

12.1.3 Capital Programme Components

Network Management and Safety

Programmes 1 – 7 are capital programmes and are largely governed within the Network Management overall governance framework. The framework has a Terms of Reference (TOR) in place which enforces the necessary disciplines across the Network Management programmes to ensure appropriate levels of management and control are implemented.

The Network Management governance of the capital programmes comprises both safety capital and non-safety capital programmes. The Network Management Programme Control Group and associated working groups prioritise, select, define and deliver projects for consultation for eventual handover to Delivery for construction.

This PCG reports up to the Safety Capital Programme Board Steering Group and then up to the Transport Safety Portfolio Steering Group (once established). Figure 12.1 illustrates at a high level where this PCG and other governance groups aligned to the PBC fit together.

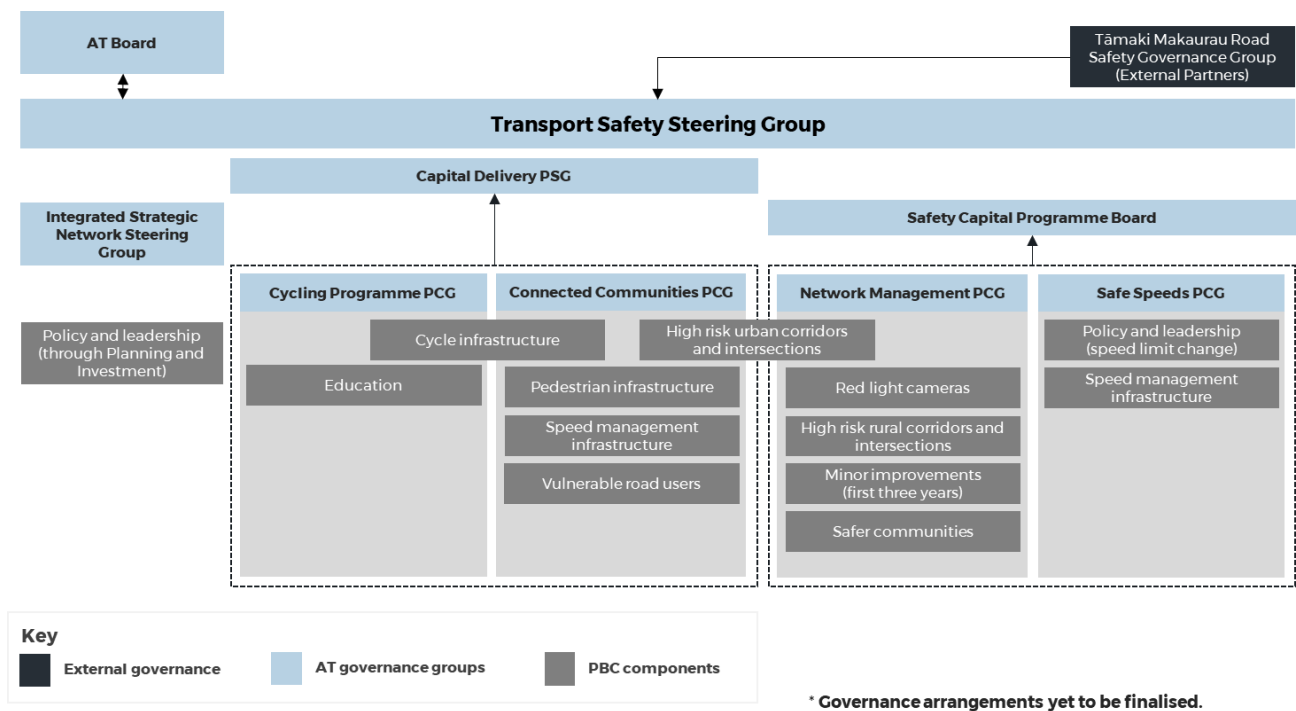


Figure 12.1 Transport Safety Governance Frameworks at AT

Safe Speeds PCG and speed programme delivery

The safe speed governance framework is split into working group and programme control group levels, also reporting up to the Safety Capital Programme Board and then up to the (currently being developed) Transport Safety Steering Group.

Auckland Transport is in the process of introducing a new bylaw to set new speed limits on approximately 10% of Auckland's local roads. The objective of the Safe Speeds governance framework is to monitor and facilitate progress of the bylaw change and assess impacts of changes on the overall programme, act as the decision maker and ultimately drive required change and manage the successful delivery of the programme.

The speed programme has a high degree of public interest. Implementation of the programme requires careful planning and execution to ensure the success of the project. The Implementation Strategy will take a staged approach where activities will be delivered through a staged series of separate contracts (e.g. investigation only, detailed design only or construction only). This method is best suited to small, simple and relatively low risk projects in terms of implementation such as for the Safe Speeds Programme projects but also where there is a high degree of public interest and engagement at the pre-implementation stage required.

Connected Communities

The connected communities programme brings together teams across AT to improve transport choice on 12 corridors and make the street environment safe and more attractive. The Connected Communities programme will deliver bus priorities and facilities, safety improvements, active mode facilities and public realm improvements along identified corridors and areas.

Along with making PT services better along these corridors, the programmes will also improve access to PT including:

- pedestrian safety and wayfinding improvements around PT infrastructure including crossings, lighting and CCTV
- providing safe and convenience cycle access to stations

The delivery model is one where AT and the private sector work in close partnership. 17 firms forming three Consortia have been procured to join AT in developing the business cases for the improvements in these areas and undertaking communications, engagement and delivery.

The connected community technical workstreams include; walking and cycling, public transport, urban design and transport planning and safety.

Problems have been identified in the cycling and safety business cases and included in the connected communities business cases with appropriate KPI's identified. The problem statement from the road safety business case to be addressed in the Connected Communities programme is:

- insufficient priority for road safety has hindered/ prevented the delivery of a safe system

The expected benefits that will result from addressing the above include:

- sustained reduction in transport related deaths and serious injuries, especially for vulnerable road users

To ensure the safety outcomes are realised and best practice identified in this business case is incorporated into design, a Safe System Advisor from the Road Safety Centre of Excellence, the Technical Active Lead and road safety engineers from Network Management provide specialist input into the Transport Planning and Safety workstream. The Connected Communities PCG, led by the Connected Communities Programme Director reports into the Capital Delivery PSG and eventually into the Transport Safety PSG which is currently getting set up.

Cycling Programme Governance Group (CPGG)

The purpose of the CPGG is to provide strategic leadership and perform an oversight (monitoring, evaluation and reporting) role to ensure cycling infrastructure improvements in the wider Auckland region are well-aligned with other investments and coordinated with planned growth in the Auckland region.

The CPGG governs the two capital programmes, the Urban Cycleways Programme and the AT Cycling Programme (from the Cycling PBC). The CPGG is not involved in the day to day management of the project but sets the broad direction to be implemented by the project team responsible for the programmes delivery.

Members include people from across several AT divisions including Service Delivery, Road Safety Engineering, Healthy Streets, Communications and Funding. As a group they ensure the safety outcomes identified in the cycling PBC are realised. This group currently reports to the Capital Delivery PSG and it is proposed they also report to the Transport Safety Steering Group once set up.

The Active Modes Working Group which feeds into the CPGG looks at both operational and capital components but predominantly the education and behaviour change elements.

12.1.4 Non-Capital Components

The additional components 8 – 10 are non-capital.

Policy Leadership & Capability

Policy and leadership changes proposed include speed limit policy changes which are governed within the safe speeds governance framework, as well as other safety related legislation for improved urban walking & cycling outcomes.

Additional policy changes will include the Planning and Investment team at AT.

AT will seek endorsement and support for proposed policy changes through the TMRSGG.

The TMRSGG are also jointly responsible for building Vision Zero/Safe System understanding and capability across their respective organisations, including the development of new tools, safety management systems, research, monitoring and public reporting of progress.

Ownership of the leadership components lies in the governance framework currently being set up at AT. All Terms of Reference (TOR's) for governance groups across all of AT are currently getting safety added to them as a requirement.

Engagement and Education

Safety education is predominately managed in the Community Transport team and the Walking, Cycling and Travel Demand Management team at AT. The component of this in the PBC is AT's share of co-ordinated education, training and awareness campaigns along with its road safety partner organisations. The Community Transport team aligns its educational campaigns with NZ Police, ACC and NZTA's campaigns.

A representative from this behaviour change group will sit on the Transport Safety Steering Group once established.

A representative from the Stakeholder, Communities and Communications team who run road safety campaigns at AT also sits on the TMRSLG.

Enforcement

Enforcement will be governed and delivered through the relationship AT have developed with NZ Police through the Tamaki Makaurau Road Safety Governance Group.

There is also a red-light camera programme being run out of Service Delivery which reports through to the Network Management PCG.

12.2 PROGRAMME DELIVERY

12.2.1 General Approach

Delivery of components of the programme will be undertaken by appropriate delivery teams within Auckland Transport.

Once a programme has been identified (such as urban corridor and intersection improvements), key themes are then used to prioritise the pipeline. Themes are either key themes which look at high risk locations based on DSI's or causal themes such as proactively eliminating causal factors (human error) such as pedestrians getting killed crossing the road mid-block. Each project is then investigated at a regional level which informs the selection of projects.

One of the key partners involved in the planning, funding and delivery of the PBC is NZTA.

NZTA have developed a new approach for the delivery of safety outcomes for speed and roads and roadside activities. The Safe Networks Programme (SNP) is a new approach for the delivery of safety outcomes for Speed Management and Roads and Roadsides activities. The overarching concept is to deliver increased levels of safety in our transport system through a range of safety investments. The safety investments focus on engagement with partners, using nationally developed tools to identify safety problems, and quicker approval processes for standard interventions to expedite delivery.

NZTA continue to work, through focused engagement with AT (and other Road Controlling Authorities) to check alignment with AT's programmes and the SNP.

AT Service Delivery team works closely with, and will continue to work with, its AT NZTA Funding Team to ensure that the elements within the pipeline are considered for NZTA co-investment which could involve a number of funding streams such as:

- Business cases;
- SNP activities that align with NZTA's standard safety interventions;
- Low cost/low risk activities; or
- Road Safety promotion activities.

Through the Tamaki Makaurau Governance Framework partners undertake joint planning to coordinate enforcement activities, education initiatives and infrastructure improvements. This partnership approach aims to improve road safety in the short and medium term through coordinating resources and sharing of data to ensure effective targeting. A key component of this work will be the introduction of new safety cameras (speed and red-light) in the region, a combined project between Auckland Transport and NZ Police to help automate enforcement at high risk intersections and corridors.

12.2.2 Programme Staging

At this point there are some key dependencies such as the speed bylaw change that will influence the staging of the programme. The programme staging will be managed through the Transport Safety Steering Group (once established) where one of their key objectives is ensuring programme alignment.

12.2.3 Monitoring of the Programme, Timing and Triggers

The approach to delivering the programme will be flexible due to the scale of the projects, the impacts of other delivery priorities in Auckland and to also enable benefits realisation optimisation. Monitoring and evaluation tools and processes will be further developed as a critical element for successful delivery of the programme. Triggers will also be determined based on the effectiveness of planned interventions which could then change the direction taken to minimise DSI's per \$. Within the governance arrangement there will be a feedback mechanism that allow changes to be made to optimise outcomes.

12.2.4 Delivery Responsibilities and Resourcing

Delivery of components of the programme will be undertaken by the appropriate delivery arms at AT. Delivery at AT is undertaken in the Portfolio Delivery team who is handed the pipeline of projects from the Service Delivery team. The Service Delivery team manage investigation, preliminary design and consultation. The Portfolio Delivery team use professional services panels to bring in external consultant expertise to undertake detailed design and use physical works panels to outsource construction. The safety outcomes are specified by Service Delivery. Road safety audits, following NZTA Road Safety Audit guidelines, are undertaken at the end of design and post construction and are completed by independent auditors to ensure that safety integrity is not compromised. Gateway approvals following detailed design will also ensure that designs are focused on safe system/vision zero principles. The project gateways require the delivery team to go back to the road safety engineer for approval.

New Safe System Assessment tools are also being trialled within this process to ensure that Vision Zero/Safe System thinking is applied at the optioneering stage of project design. Safety, Service Delivery and Portfolio Delivery representatives sit on the Safety Capital Programme Board and manage programme level safety outputs together.

12.3 STAKEHOLDER ENGAGEMENT AND COMMUNICATIONS PLAN

12.3.1 Key Stakeholders

Key stakeholders will be engaged prior to the general public as coordination with partners and stakeholders is critical in ensuring successful implementation of the projects. Key stakeholders include NZTA, Auckland Council, NZ Police, MoT, Mana Whenua, ACC and the health sector and all are members of the Tamaki Makaurau Governance and Leadership Groups.

The TM Road Safety Leadership group has also established the TM Road Safety Reference group to provide a focus for two-way communication about road safety and Auckland's road safety programme in Auckland. The reference group includes a range of road user groups, NGO's and safety interest groups who contribute to the programme by:

- Ensuring that local organisations or groups with an interest in the programme are involved in its development
- Ensuring programmes accurately reflect community aspirations and deliver established objectives
- Identify and communicate community and stakeholder concerns about the programme
- Consider the range of community views, interests and issues related to road safety in Auckland
- Inter-organisation conversations.

The role of the group is consultative and the TMRSLG will carefully consider all input from the group in the light of overall strategic objectives for the programme, as well as statutory and other government policy requirements.

Elected representatives are also key stakeholders and will be engaged early on with the projects within the programme. Local Board members in particular have knowledge and insights valuable to the successful implementation of all components of the programme particularly high-risk intersection and corridor improvements, supporting mode shift for vulnerable road users and speed management.

Auckland Transport's Stakeholder, Communities and Communications team will facilitate the identification and engagement with these stakeholders.

12.3.2 General Public

The people living in the community play a crucial role in shaping the implementation of these improvements. Where possible, AT will undertake public consultation where people can input into the project early and throughout the process.

The project information will be clear, accurate and disseminated widely so as many people as possible are aware of the public consultation. Not only will this help to improve the projects, but it will build excitement and anticipation for people who will see a vision of an Auckland with zero road deaths.

12.4 PROGRAMME PERFORMANCE AND REVIEW

Road safety programme is monitored through a results-based performance management framework as outlined in the TMRSSG TOR (from outputs to intermediate performance measures to final outcomes).

Various partners are responsible for setting up, monitoring and evaluation outcomes and performance measures. AT pulls this information together for an overall annual performance management report.

In addition, implementation performance measures are also to be developed to ensure that projects deliver the intended outcomes and these will be managed through the programme steering group such as SSAF compliance, quality control, programme sequencing etc.

13 COMMERCIAL CASE

The commercial case will be developed in subsequent business case stages.

A clear procurement strategy will be developed to ensure value for money is demonstrated.
