Te Kāwanatanga o Aotearoa New Zealand Government

Transport Knowledge Hub

THE NEW ZEALAND

TRANSPORT EVIDENCE BASE STRATEGY

Ensuring the transport sector has the right data, information, research and evaluation to deliver a transport system that improves wellbeing and liveability.

December 2019

ACKNOWLEDGEMENTS

We are grateful to all those people who have assisted with developing the documents that comprise the New Zealand Transport Evidence Base Strategy. These include Waka Kotahi NZ Transport Agency, Civil Aviation Authority, Maritime New Zealand, KiwiRail, New Zealand Police, Statistics New Zealand, University of Otago, and Local Government New Zealand. A full list of stakeholders is included in Appendix 1.

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CHIEF EXECUTIVE'S INTRODUCTION

There is no doubt transport plays a vital role in supporting prosperity and wellbeing for New Zealand.

A well-functioning transport system enables businesses, regions, and cities to be well connected and productive. It's also about improving access to employment, education and social opportunities.

The use of high-quality data, information, research and evaluation is crucial to ensure we are making the best possible investment and planning decisions.

Our transport system is not just about getting people or goods from A to B, it shapes the quality and character of the places we live and how we experience life, not only now – but quite possibly for many generations to come.

That means we need to understand how transport affects these outcomes for better or worse, and to have a 'big picture' view of what we are working towards.

The *Transport Evidence Base Strategy* will ensure that the transport sector has the necessary data and information to support evidence-based policy decisions, and that we are investing in the right research to support this. It also provides the necessary evaluation framework for monitoring and evaluating system performance and policies.

Coordination and collaboration between the government transport agencies, and the wider transport sector, is key to ensuring we are able to deliver on this. By coordinating our efforts we can use the power of evidence to deliver a transport system that improves intergenerational wellbeing and liveability of New Zealand's cities, towns and regions.

Peter Mersi
Chief Executive
Ministry of Transport

Ministry of Transport
TE MANATŪ WAKA

WAKA KOTAHI
NZ TRANSPORT AGENCY

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

Nō te rere moana Aotearoa
MARITIME NEW ZEALAND

EXECUTIVE SUMMARY

The *Transport Evidence Base Strategy* creates an environment to ensure data, information, research and evaluation play a key role in shaping the policy landscape. Good, evidence-based decisions also enhance the delivery of services provided by both the public and private sectors to support the delivery of transport outcomes and improve wellbeing and liveability in New Zealand. To enable this, a revised set of data, research and evaluation priorities and initiatives has been developed following sector engagement to reflect changes in Government priorities for transport.

The *Transport Domain Plan* (Domain Plan) and *Transport Research Strategy* (Research Strategy) were first published in July 2016.

Collectively these documents create an environment to ensure the transport sector has the right data, information and research for evidence-based decision-making. Following the release of the Ministry of Transport's Transport Outcomes Framework in mid-2018, the government transport agencies and key stakeholders initiated a refresh of the Domain Plan and Research Strategy to reflect the updated government transport priorities and outcomes.

A SINGLE STRATEGY TO ENHANCE EVIDENCE-BASED DECISION-MAKING

This, the *Transport Evidence Base Strategy*, brings together an updated version of the Domain Plan and Research Strategy together with the new Evaluation Strategy into a single document with the goal of:

Ensuring the transport sector has the right data, information, research and evaluation to deliver an evidence-based transport system that improves wellbeing and liveability.

The strategy has two primary objectives:

1. Ensure the right data, information, research and evaluation is available for decision-making
2. There is an established culture of evidence-based policy and decision-making.

ENSURING THE RIGHT DATA, RESEARCH AND EVALUATION IS AVAILABLE

The *Transport Evidence Base Strategy* provides a comprehensive approach to ensure the sector has a coordinated approach to delivering the right data, research and evaluation based on 5 key enablers:

1. **Improve access:** Ensure data, research and evaluation findings are discoverable, accessible and reusable
2. **Improve governance:** Ensure sharing, integration, and governance of key data and information products
3. **Invest in the right activities:** Ensure we invest in the right activities and projects
4. **Facilitate collaboration:** Foster cross-agency collaboration and relationships with the wider transport sector
5. **Develop capacity and capability:** Ensure the sector has access to the right skills and knowledge.

ESTABLISHING A CULTURE OF EVIDENCE-BASED POLICY AND DECISION-MAKING

The ability to demonstrate that there is an established culture of evidence-based policy and decision-making is vital to ensuring the success of the *Transport Evidence Base Strategy*. In order to achieve this it is necessary to bridge the gap between those who generate and maintain evidence, and those who use it. Initiatives such as the appointment of the Ministry of Transport's Chief Science Adviser and establishment of the Transport Knowledge Hub, which creates a transport community of interest, are key to ensuring the necessary mechanisms are in place to realise this.

A COLLABORATIVE APPROACH TO IMPLEMENTATION

Delivery of the *Transport Evidence Base Strategy* is the joint responsibility of the government transport agencies inclusive of the Ministry of Transport, Waka Kotahi NZ Transport Agency, Maritime New Zealand, and Civil Aviation Authority.

An Implementation Plan will be developed jointly by these agencies in consultation with Local Government New Zealand and other key stakeholders from the wider transport sector. This will set out a 3-year work programme to implement the high-priority initiatives identified in this strategy. The *Transport Evidence Base Strategy* will be reviewed annually, with a full review of progress taking place every three years starting in 2022.

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BACKGROUND

The *Transport Domain Plan* (Domain Plan) and *Transport Research Strategy* (Research Strategy) were first published in July 2016.

Collectively these documents create an environment to ensure the transport sector has the right data, information and research for evidence-based decision-making. Following the release of the Ministry of Transport's Transport Outcomes Framework in mid-2018, the government transport agencies and key stakeholders initiated a refresh of the Domain Plan and Research Strategy to reflect the updated government transport priorities and outcomes.

Recognising that evaluation also forms a crucial part of the transport evidence base, the Ministry of Transport also developed an Evaluation Strategy, with support from the transport sector.

This, the *Transport Evidence Base Strategy (TEBS)*, brings together an updated version of the Domain Plan and Research Strategy together with the new Evaluation Strategy into a single document. This will ensure efforts to develop and implement the evidence base are aligned with the desired outcomes for transport.

DOMAIN PLAN AND RESEARCH STRATEGY REFRESH

The refresh was carried out through a series of workshops in mid to late 2018. Attendees included representatives from the government transport agencies, local government and key transport stakeholders (refer Appendix 1 for a list of workshops and attendees).

A summary of changes to the original Domain Plan and Research Strategy is available in Appendix 2.

The following documents may be referenced for an understanding of the approach taken to develop the original Domain Plan (based on the Stats NZ domain planning methodology) and the Research Strategy 2016-2020:

EVALUATION STRATEGY

This is the first time a *New Zealand Transport Evaluation Strategy* has been developed. While evaluation is not new in the transport sector, this strategy provides a practical framework to lift the amount of quality evaluation in transport, and develop a culture where evaluation is embedded into the development and implementation of transport-related regulation, policy and investment.

ORGANISATIONAL ENDORSEMENT

TEBS is endorsed by the following key transport stakeholders who each have a role in ensuring delivery of the desired transport system:

Ministry of Transport
TE MANATŪ WAKA

WAKA KOTAHI
NZ TRANSPORT AGENCY

Nō te rere moana Aotearoa
MARITIME NEW ZEALAND

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

GOAL AND PURPOSE

GOAL

Ensure the transport sector has the right data, information, research and evaluation to deliver an evidence-based transport system that improves wellbeing and liveability.

STRATEGIC OBJECTIVES:

1. Ensure the right data, information, research and evaluation is available for decision-making
2. There is an established culture of evidence-based decision-making

WHO IS TEBS FOR?

It is intended that TEBS is used and implemented by:

- Central & local government transport agencies and departments
- Private sector – including consultants and third-party data providers
- Government officials
- Transport analysts, researchers, and evaluators
- Non-government sector
- All New Zealanders with an interest in ensuring the right data, information, research and evaluation is available to deliver a transport system that improves people's wellbeing and the liveability of places.

RECOGNITION OF MĀORI VALUES

Ngā mātāpono (guiding principles) of *Hei Arataki*, the Ministry of Transport Māori Strategy[1] have been adopted by TEBS to ensure recognition is given to Māori values in the collection, management and use of data and information pertaining to Māori. These are illustrated to the right and will be embedded in the implementation of all relevant 'evidence' activities identified in TEBS as follows:

1. Rangatiratanga (empowering and leading) – recognition for the Treaty of Waitangi and its principles in the implementation of TEBS.
2. Kaitiakitanga (guardianship and support) – recognising that data are a taonga for Māori and ensure that all uses of this are 'managed in a highly trusted, inclusive, and protected way'[2].
3. Whanaungatanga (collaboration and unity) – working together with Māori people, researchers and organisations to enhance the availability of the right evidence and use of this to improve outcomes for Māori.
4. Manaakitanga (caring for and valuing others) – showing mutual respect for tikanga Māori (Māori traditions and culture) and kaupapa Māori research and evaluation methodologies.

TEBS also recognises mātauranga Māori (Māori knowledge and bodies of knowledge) in the collection, management and use of a Māori evidence base. Mātauranga Māori methodology gives rise to Māori evidence bases as a taonga, and calls on its critical understanding to support Māori aspirations.

NGĀ MĀTĀPONO GUIDING PRINCIPLES

Rangatiratanga
Empowering and leading

We recognise the Treaty of Waitangi and its principles. We communicate honestly, share and co-design, and understand the Crown-Māori relationship.

Kaitiakitanga
Guardianship and support

We recognise the role we play to safeguard and protect the transmission of Māori knowledge and taonga.

Whanaungatanga
Collaboration and unity

We engage and work with Māori people and organisations to leverage collective aspiration and capabilities.

Manaakitanga
Caring for and valuing others

We support and encourage each other, and we create environments that respect and value Māori people and Māori ways of seeing, thinking and feeling.

1 Hei Arataki demonstrates the Ministry of Transport's commitment to recognising Māori values and culture in its role as the transport system leader and provides a strategic framework to improve transport outcomes for Māori.
2 Stats NZ Data Strategy and Roadmap December 2018

ALIGNMENT WITH GOVERNMENT PRIORITIES FOR TRANSPORT

Transport is an integral part of daily life for all New Zealanders.

We use the transport system to travel to work, education, or health facilities, for visiting family and friends, and for the movement of freight and other goods. The transport system should be inclusive, healthy and safe, and contribute to a sustainable, resilient, and prosperous society.

The transport system is a key enabler in achieving the Government's overall outcomes. To do this it needs high-quality data, information, research and evaluation on which to base decisions.

CONTRIBUTING TO THE GOVERNMENT'S OVERALL PRIORITY OUTCOMES

Government's overall priority outcomes are grouped into three broad themes[3]:

- **Build a productive, sustainable and inclusive economy** through regional economic development, addressing climate change and continued economic growth and shared prosperity, as well as the need to support innovation in the economy.
- **Improve the wellbeing of New Zealanders** and their families across a range of areas, including health, education, employment, housing, justice, police and social development.
- **Provide new leadership** by Government by working across portfolios with coordinated management and monitoring to achieve the Government's goals.

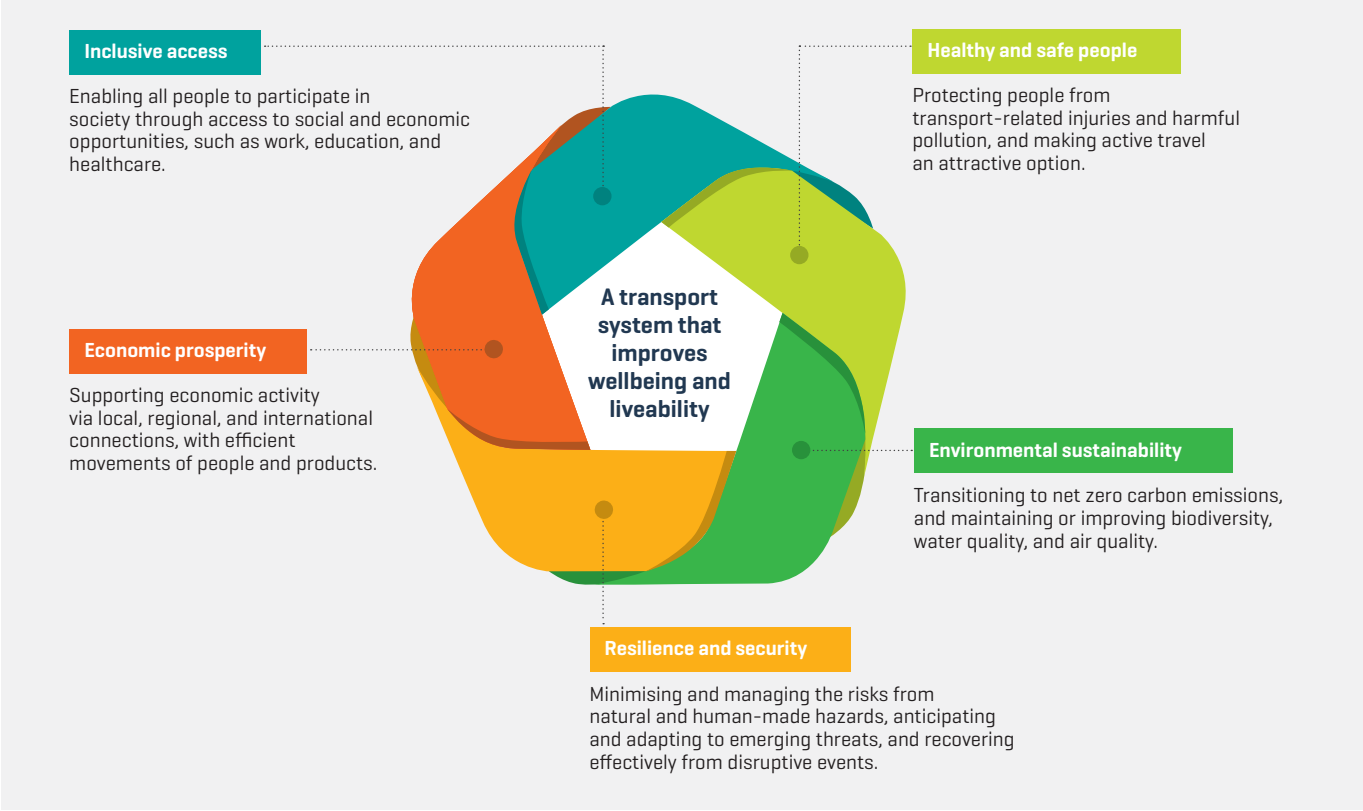
The *Transport Evidence Base Strategy* is positioned to ensure that the transport sector has a common understanding of the data, information, research, and evaluation needs to deliver the desired outcomes for transport, and a comprehensive strategy to achieve this.

DELIVERING AGAINST THE NEW SET OF DESIRED OUTCOMES FOR TRANSPORT

The Ministry of Transport released the *Transport Outcomes Framework*[4] in June 2018. This is aligned with Treasury's *Living Standards Framework*[5] and establishes the groundwork for a strategic approach to deliver a transport system that improves people's wellbeing, and the liveability of places. This identifies the 5 outcomes (inclusive access, healthy & safe people, environmental sustainability, resilience & security, and economic prosperity) government is seeking to achieve to deliver the desired transport system (refer Figure 1). All of these outcomes are inter-related, and need to be met as a whole to improve intergenerational wellbeing and quality of life across New Zealand's cities, towns, and provinces (liveability).

3 http://www.beehive.govt.nz/sites/default/files/2018-09/Progressing Our Government's Priorities.pdf
4 https://www.transport.govt.nz/assets/Uploads/Our-Work/Documents/ef9cf74c3c/Transport-outcomes-framework.pdf
5 https://treasury.govt.nz/information-and-services/nz-economy/living-standards/our-living-standards-framework

FIGURE 1:
TRANSPORT OUTCOMES FRAMEWORK



Underpinning this is the principle of 'mode neutrality'. Mode neutrality means considering all transport modes when planning, regulating and funding transport, and basing decisions on delivering positive social, economic, and environmental outcomes. Mode neutrality involves two important aspects:

1. Making sure all modes and options are considered and evaluated to find the best system solution.
2. Making users and decision-makers more aware of the benefits and costs of transport choices, to incentivise robust decision-making and smart travel choices.

A NEW STRATEGY FOR IMPROVING EVIDENCE-BASED DECISION-MAKING

TEBS consists of 5 complementary strategies and ongoing programmes of work that collectively ensure the sector has the right data, information, research and evaluation for evidence-based decision-making. These include:

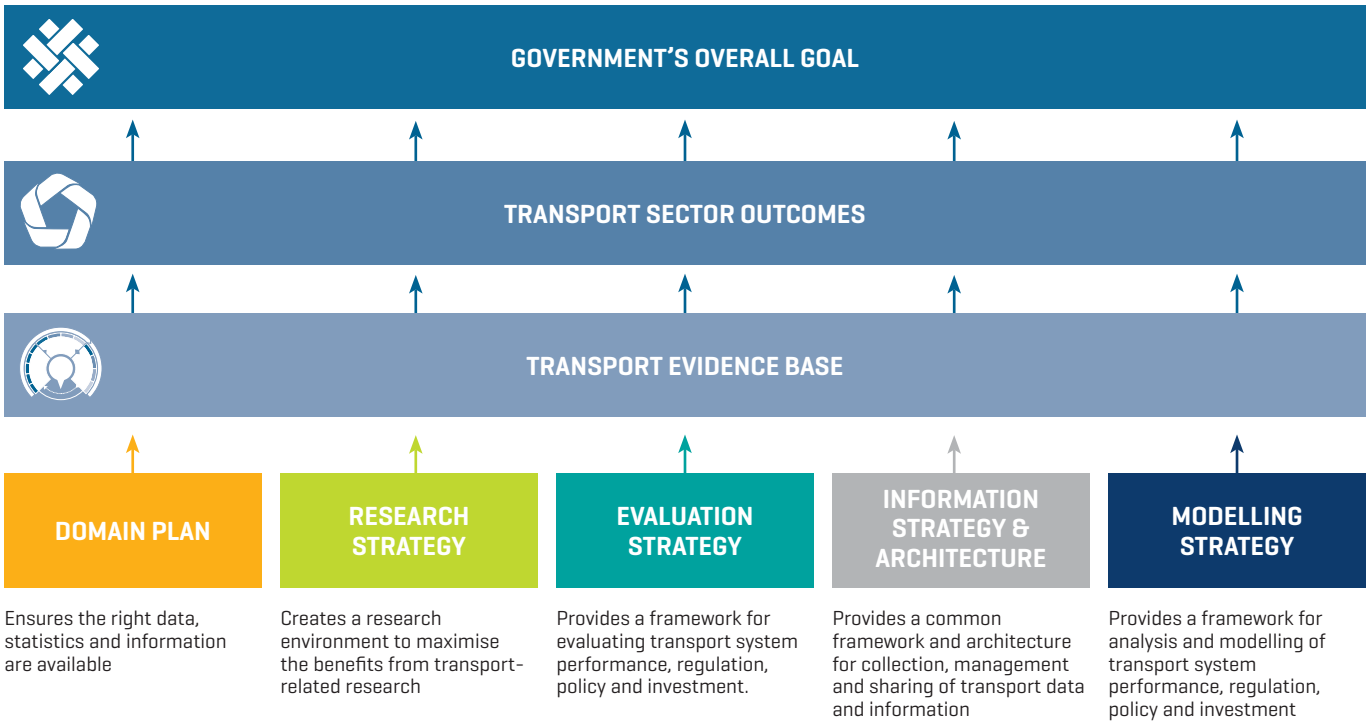
1. *Domain Plan* – ensures the right data, statistics and information are available to understand our transport system and make evidence-based decisions. This identifies data and knowledge gaps and priorities to maximise the value of data, statistics, and information (originally published in 2016).
2. *Research Strategy* – creates a research environment to maximise the benefits from transport-related research (originally published in 2016).
3. *Evaluation Strategy* – provides a framework for evaluating transport system performance, regulations, policies, and investment, and identifies activities that support high-quality evaluation activities within and across sectors (new).

Further supporting documents in development include the:

4. *Information Strategy and Architecture* – provides a common framework and architecture for the collection, management and sharing of transport data and information.
5. *Modelling Strategy* – provides a framework for analysis and modelling of transport system performance, regulation, policy and investment.

The relationship between the *Transport Evidence Base Strategy*, *Transport Outcomes Framework* and the Government's overall priority outcomes and goal is illustrated in Figure 2.

FIGURE 2:
OVERVIEW OF THE TRANSPORT EVIDENCE BASE STRATEGY



DELIVERING AN EVIDENCE-BASED TRANSPORT SYSTEM

The transport system is complex and is comprised of:

- The vehicles that move people and products (both active and powered modes)
- Physical infrastructure (e.g. roads, railway lines, ports, airports, footpaths, cycle ways)
- Digital infrastructure (e.g. satellite-based navigation aids, travel apps, communications technologies)
- Mobility services (e.g. public transport, shared mobility such as bike-sharing, ride-sharing, shared e-scooters)
- The institutions and regulatory systems that influence how the transport system functions and develops (e.g. through their structures, management practices, rules, policies, and funding/investment tools).[6]

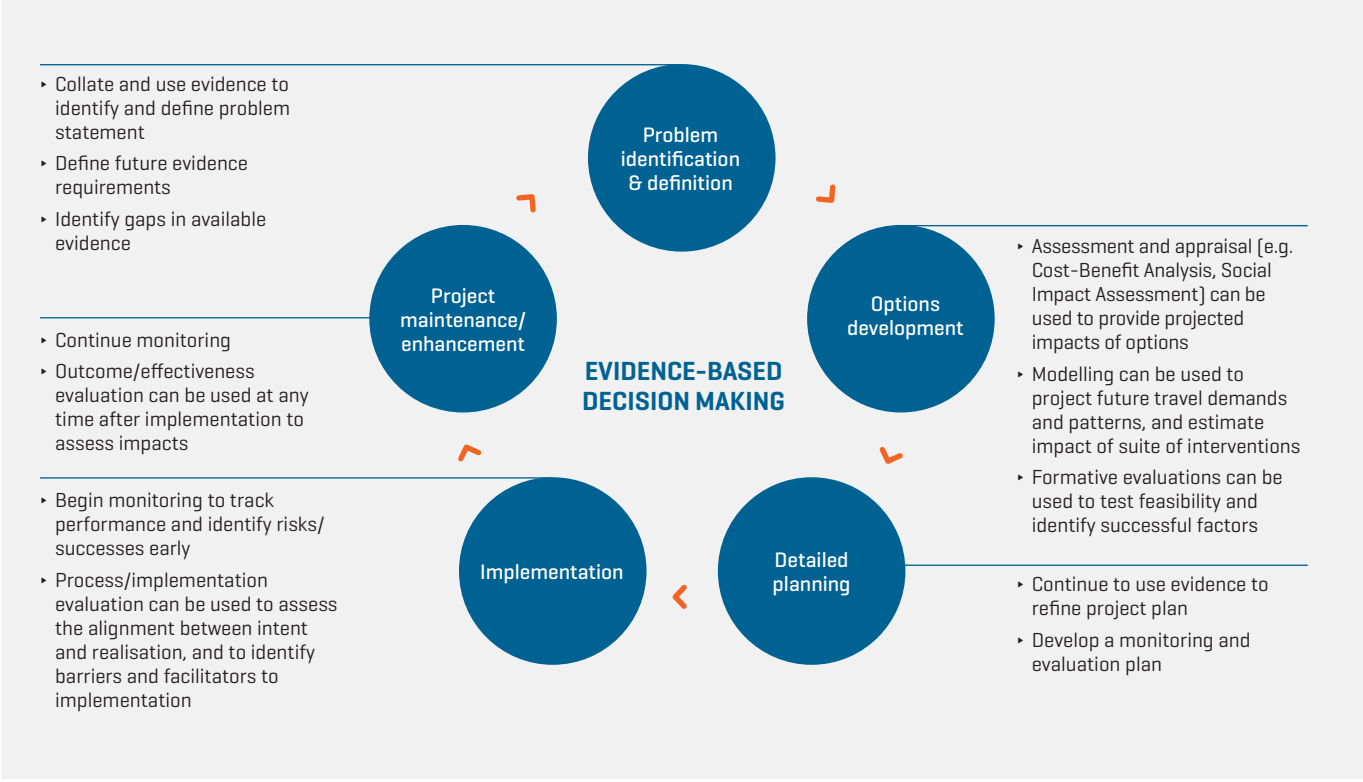
Delivering an evidence-based transport system requires considerations of the complex environment and is achieved through:

1 IMPROVING OUR UNDERSTANDING OF THE NEW ZEALAND TRANSPORT SYSTEM

We need good-quality evidence – data, information, research and evaluation – about how this system works if we are to make good decisions about how we manage it now and in the future. Evidence forms a vital part of the decision-making process from project inception and defining the problem that needs to be addressed, through to the development of options, planning, implementation and ongoing monitoring and evaluation activities as shown in Figure 3.

Closing high-priority data and information gaps identified during the decision-making process are incorporated into the Domain Plan, while research gaps are incorporated into the Research Strategy. Identifying and addressing these data and research gaps requires collaborative effort of the transport sector. The approach to evaluation is described in the Evaluation Strategy to ensure that evaluation is well planned and findings are used to inform future decision-making.

FIGURE 3:
HOW THE USE OF EVIDENCE CONTRIBUTES TO DECISION-MAKING



6 Derived from the Transport Outcomes Framework June 2018

2 RECOGNISING FUTURE CHALLENGES FACING THE TRANSPORT SECTOR

Our transport system faces a number of emerging challenges and uncertainties that need to be considered if we are to plan and prepare for the future. The *Transport Outlook: Future State* looks to the future, and projects transport demand over the next 25 years for a base case and alternative scenarios based on two of the most significant uncertainties for the transport sector – the rate at which New Zealanders adopt new technology and how they prefer to connect with each other[7]. The list below expands on these ideas and includes further challenges facing the transport sector from economic, social, cultural and environmental changes and our ability to respond to these. This aims to encourage us to think about how the transport sector may evolve in the future and improve our understanding of the choices and decisions we may face.

FUTURE CHALLENGES FACING THE TRANSPORT SECTOR

We need to ensure there is a good evidence base to respond to changes in economic, social, cultural and environmental conditions and help answer the following:

- What are the future technologies that could change the way the transport system operates, and what impact (including unintended consequences) might they have?
- How will increased spatial changes in population and changes in demographics affect travel patterns and demand for transport services?
- What climate change mitigation efforts are required and by when? How will the transport system transition to net zero carbon emissions? What are the anticipated impacts of climate change on the transport system? What adaptation solutions can be best used to minimise these impacts?
- What will the future demand for transport look like and how can we manage or plan for this now?
- How are people's perceptions, attitudes and values changing, and what impact will they have on the transport system?

7 https://www.transport.govt.nz/mot-resources/transport-outlook/

3 ESTABLISHING A CULTURE OF EVIDENCE-BASED POLICY AND DECISION-MAKING

Ensuring the sector has the necessary evidence upon which to base decisions is just the first step. Demonstrating that this adds value and contributes appropriately to the decision-making process is also a key component of TEBS.

Examples of how the transport evidence base contributes to decision-making include:

- Improving environmental and health outcomes:
  Transport infrastructure projects rely on high-quality, robust evidence to ensure consideration is given to the associated environmental and health outcomes. This includes the ability to answer questions such as what are the best low noise surfaces, what planting would best be used improve biodiversity, and what alternative construction techniques should be implemented to reduce road run-off?
- Improving social equity:
  The Ministry of Transport is developing a Social Impact Assessment (SIA) framework that complements the traditional Cost-Benefit Analysis (CBA) process and assesses the distribution of social impacts arising from transport policies, e.g. policies that encourage a shift towards 'low emissions' vehicles. The SIA will help a policy maker identify vulnerable groups or households that may be positively or negatively impacted and enables appropriate supporting or mitigation measures to be implemented.
- Investing in active transport (walking and cycling):
  The New Zealand Household Travel Survey (HTS)[8] collects information about day-to-day travel such as how, where, and when New Zealanders travel. The results provide a picture of travel patterns and choices, information which is vital for developing transport policy in areas such as investment in walking and cycling infrastructure.

4 BRIDGING THE GAP BETWEEN EVIDENCE AND DECISION-MAKING

In order to achieve a successful 'culture of evidence-based policy and decision-making' it is necessary to bridge the gap between those who generate and maintain the evidence base, such as researchers and data analysts, and those who use it for decision-making, such as a policy makers and government officials. Recently implemented initiatives in place to achieve this include:

- Appointment of the Ministry of Transport's:
  - Chief Science Adviser to improve connections between research, science and policy; and
  - Chief Economist to enhance the Ministry's economic analysis, advice and policy capability.
- Establishment of the Transport Knowledge Hub and governance structure representative of the sector to create a transport community of interest. This aims to improve the availability, visibility and reuse of evidence and create an understanding of how it can be used by policy and decision makers. This is further detailed on page 20.
- Annual Transport Knowledge Conference (and Transport Research Colloquium) hosted by the Ministry of Transport that brings together the transport research, data and evaluation community with government officials, decision makers and policy teams from across the wider transport sector.

More needs to be done to continue to facilitate delivery of an evidence-based transport system. This includes development of a set of 'enablers', to help direct activities required to implement TEBS (discussed below), and the TEBS Implementation Plan, to deliver the recommended initiatives and assign responsibility to the appropriate agency or agencies. This is further discussed in the final section of this document, Next Steps.

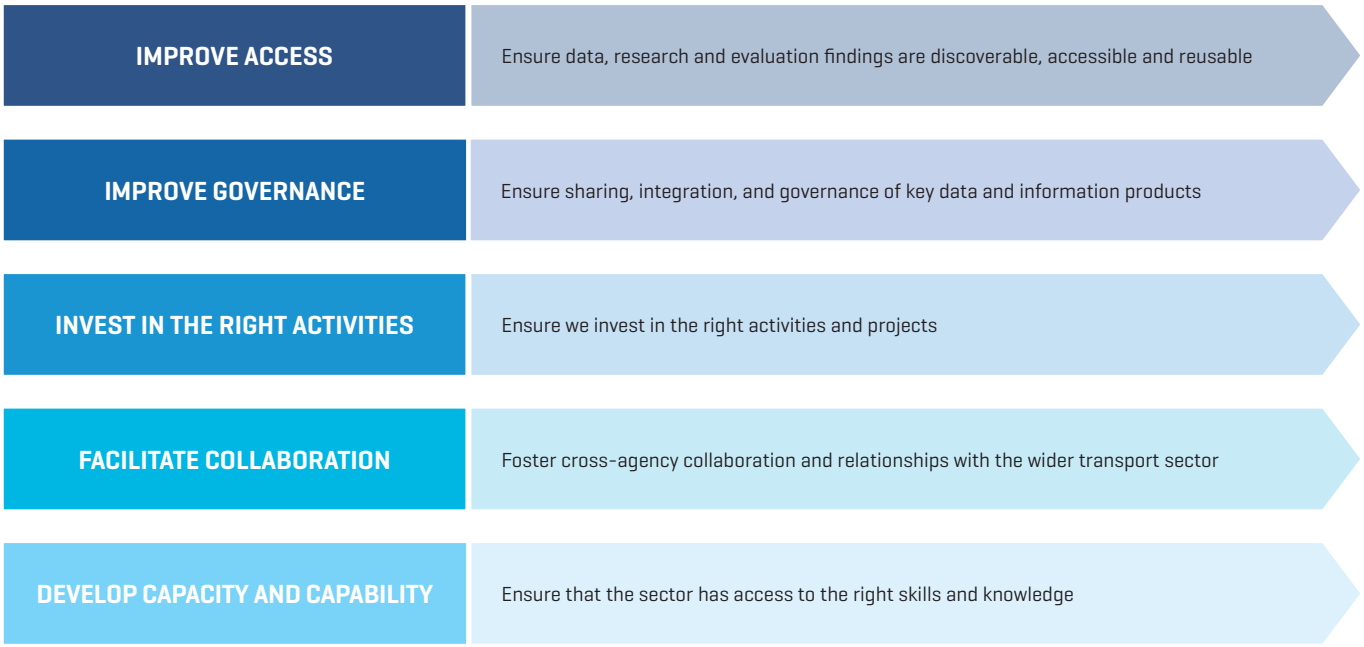
8 https://www.transport.govt.nz/mot-resources/household-travel-survey/

TRANSPORT EVIDENCE BASE ENABLERS

Having sufficient and reliable transport evidence available at the right time helps to inform policy decisions that address long-term strategic issues for the sector.

Reflecting these needs, five enablers in Figure 4 below have been identified to support the generation and use of the transport evidence base.

FIGURE 4: TRANSPORT EVIDENCE BASE ENABLERS



A summary of the enablers and the vision of how they can be applied to achieve the overall objective of the respective TEBS strategies is presented in Table 1.

TABLE 1:
APPLYING THE ENABLERS TO THE RESPECTIVE TEBS PLANS AND STRATEGIES

	Improve access	Improve governance	Invest in the right activities	Facilitate collaboration	Develop capacity and capability
Domain Plan	Existing data and information is discoverable, accessible and reusable, and its value is maximised at agency level	Data and information is collected, managed, and shared in a consistent manner and able to be used	We are able to close priority data and information gaps where the collection of new data or additional data is required	There is an increase in the number of cross-government and public-private data-sharing partnerships	The sector has the necessary skills and capabilities to collect, analyse and disseminate data and information products
Research Strategy	Research inputs and results are available to the wider community	There is coordination and prioritisation of research activities and funding opportunities across the wider research community	There is clear guidance on how to identify priorities for transport research to achieve transport outcomes	There is a systematic approach to building and maintaining interests in transport research across the wider research sector	There is a thriving research community with the necessary capability and capacity to produce high-quality research that contributes to transport outcomes
Evaluation Strategy	Evaluation findings are available and presented in a digestible way	Data and information is shared between agencies to reduce project cost, and improve consistency in evaluation findings by relying on a single source of truth	We are investing in the right evaluation to deliver the greatest contribution to the transport outcomes	The transport evaluation community is engaged to share knowledge, discuss challenges, and identify solutions	The sector has access to the right capability to identify, specify, deliver and understand evaluation

ENDURING QUESTIONS

The enduring questions are the big-picture strategic-level questions government needs to answer to make evidence-based strategy, policy and operational decisions about transport into the future. Framing enduring questions is a way of categorising and structuring the things 'we know we will need to know' into the future to inform high-quality operational, administrative, investment and policy decisions.

The enduring questions were developed with stakeholders during development of the original Domain Plan and Research Strategy. The validity of these was reassessed as part of the refresh project and found to be still sound and pertinent for their intended purpose. Changes to the enduring questions to reflect future challenges facing the transport system are available in Appendix 2. The full list of enduring questions are included in Appendix 3 as they are fundamental to understanding the purpose of the *Transport Evidence Base Strategy* and the requirement for high-quality data, information, research and evaluation.[9]

The enduring question topics have been mapped to the respective transport outcomes in Appendix 4. In several cases a topic will map to one or more transport outcomes reflecting the overlapping relationship between topics and outcomes.

9 A full review of the enduring questions will take place as part of the TEBS 3-yearly review starting in late 2022.

3-STEP PRIORITISATION FRAMEWORK

The 3-Step knowledge development and prioritisation framework (3-Step) in Figure 5 has been developed for targeting evidence generating investments across the transport sector[10]. This creates a common approach for how government transport agencies prioritise transport data, research and evaluation in order to answer the enduring questions.

The 3-Step is designed to be an iterative process as follows:

STEP 1 Ensures knowledge gaps in achieving the desired outcome can be identified. This requires assessing whether a knowledge gap exists, and how addressing the gap can achieve understanding or deliver the desired transport outcomes.

STEP 2 Makes sure the nature of the knowledge gap can be identified. This requires assessing the type of knowledge gap that exists to make sure research efforts are appropriately spread across different types of data and research gaps.

STEP 3 Aims to make sure closing the knowledge gaps will maximise the benefits from doing so.

The framework provides agencies with clear guidance on how best to ensure efforts are prioritised according to sector needs to support evidence-informed intervention decisions, while ensuring such effort delivers the best outcomes to enhance the knowledge base and the research capability of the sector.

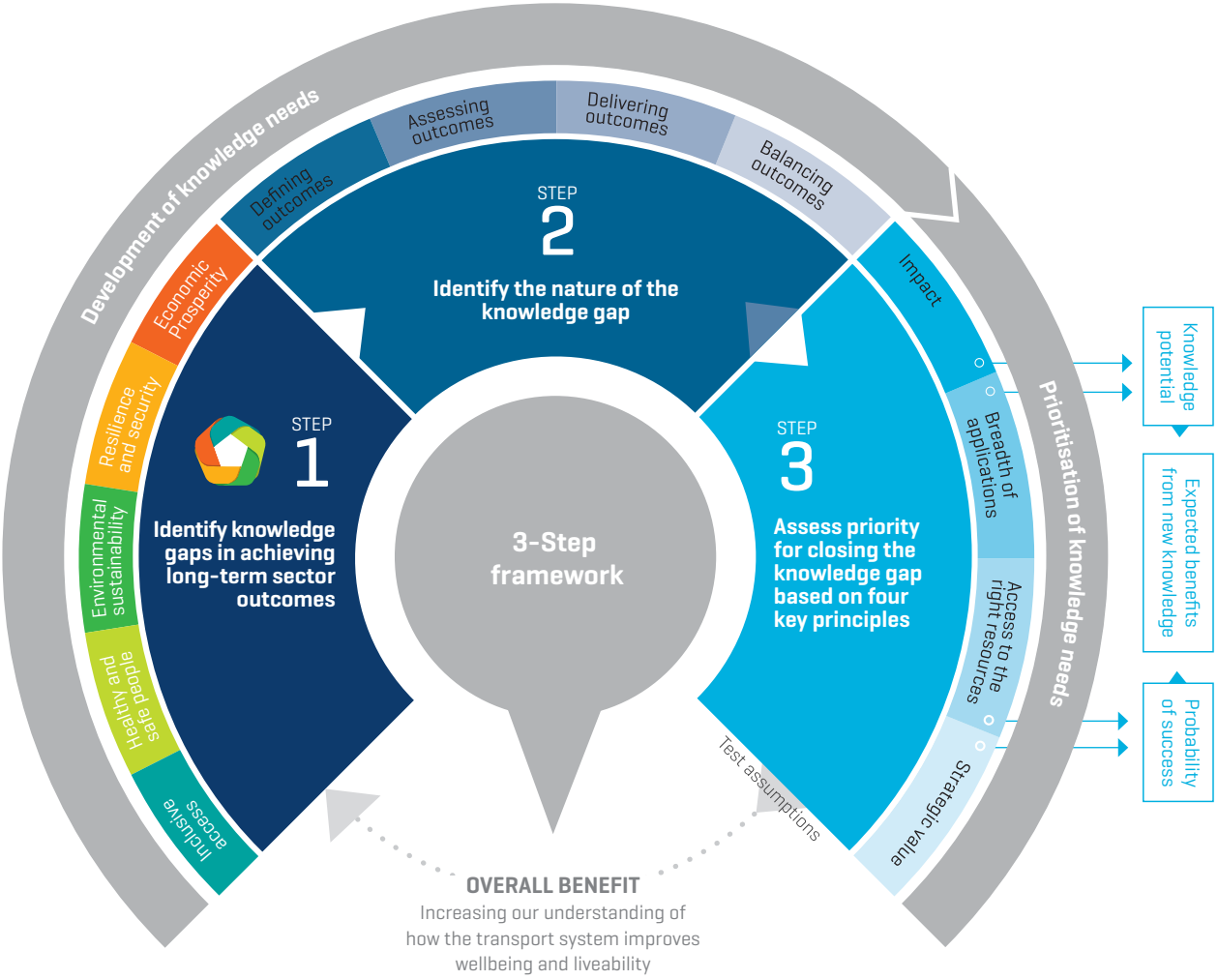
Applying the 3-Step, for example, has resulted in the following priority lists relevant to TEBS:

- Summarised list of the top 10 most important recommended initiatives to fill knowledge gaps and build sector capability and capacity.
- Domain Plan:
  - overarching recommended initiatives – the initiatives required to ensure access to, and availability of, the evidence base and build sector capability and capacity
  - prioritised data and information initiatives – data and information needs required to fill the most important gaps in our evidence base
- Research Strategy:
  - New list of research focus areas – these are the most pressing research topics that are required by the sector to fill the knowledge gaps in our evidence base.

This framework is flexible and can be adapted for selecting high-level knowledge themes, specific data or research topics, and evaluation projects or programmes. We recommend researchers and agencies continue to use the framework as a reference to develop and prioritise data or research projects and programmes during the corresponding selection process.

10 The 3-Step replaces the Triple-4 originally developed for the Research Strategy (2016-2020) and extends its intended scope of use to include investment in data, research and evaluation activities.

FIGURE 5:
3-STEP KNOWLEDGE DEVELOPMENT AND PRIORITISATION FRAMEWORK



Definitions:

- **Inclusive access**
  Enabling all people to participate in society through access to social and economic opportunities such as work, education, and healthcare
- **Healthy and safe people**
  Protecting people from transport-related injuries and harmful pollution and making active travel an attractive option
- **Environmental sustainability**
  Transitioning to net zero carbon emissions and maintaining or improving biodiversity, water quality, and air quality
- **Resilience and security**
  Minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats and recovering effectively from disruptive events
- **Economic prosperity**
  Supporting economic activity via local, regional, and international connections, with efficient movements of people and products

- **Defining outcomes**
  Identifies and defines the outcome to pursue
- **Assessing outcomes**
  Identifies how the outcomes might be best assessed
- **Delivering outcomes**
  Identifies the best intervention(s) to secure improvements or to close any gaps to the desired state
- **Balancing outcomes**
  Identifies the appropriate balance and trade-off between outcomes and efforts

- **Impact**
  Assessing the extent to which current knowledge can be advanced
- **Breadth of applications**
  Assessing the extent to which the new knowledge can be spread and absorbed across the wider sector and applications to help build sector capability
- **Access to the right resources**
  Assessing whether there is access to the right capacity, capability, tools, data, systems and financial resources (eg through better sector integration) to close the knowledge gap
- **Strategic value**
  Assessing whether the new knowledge can be used to help address the strategic issues faced by the sector

- **Knowledge potential**
  → Size and breadth of benefits
- **Probability of success**
  → Extent to which the new knowledge can be translated into tangible outcomes

TRANSPORT KNOWLEDGE HUB PURPOSE AND GOVERNANCE

The Transport Knowledge Hub (knowledge hub) creates a community of interest to aid implementation of TEBS. The purpose of the knowledge hub is to:

- Enable communication between the people and agencies that generate, supply, and demand transport data, information, research, and evaluation
- Create a collaborative environment for the transport community to share data, statistics and information, research and evaluation ideas, and results
- Provide a mechanism to identify and close future knowledge gaps, research and evaluation needs and opportunities for the sector, and improve the transport evidence base for decision-making
- Consider the wider domestic and international context.

This is achieved by:

- Organising regular seminars and other events to promote the sharing of knowledge, research, evaluation, data, and ideas
- Maintenance of the knowledge hub mailing list and website to communicate with members[11]
- Promoting cross-agency collaboration through special interest Topic Hubs. These focus on particular subject areas such as aviation, economics or safety and bring together transport professionals from government, the private sector, academia and non-government
- Providing a framework for evaluating, prioritising and filling data, information and research gaps and ideas
- An established governance structure that is representative of the wider transport sector to assist the sector to develop and meet its transport knowledge, research and evaluation needs.

GOVERNANCE OF THE KNOWLEDGE HUB

Establishing broader governance arrangements for the knowledge hub provides a mandate for the sector to work together to build and maintain the necessary research and data community. By introducing an element of accountability, the governance arrangements can further enhance the connection and collaboration functions of the hubs.

Having an appropriate governance structure enables the sector to regularly assess and review research, evaluation, data, statistical and information gaps and priorities, and to identify opportunities to conduct collaborative research.

Governance and participation in the knowledge hub is comprised of the following (refer figure 6):

- **Cross Agency Governance Committee (CAGC)** – comprised of executive level representatives from the core government transport agencies[12]. This group provides a forum for communicating and coordinating top-level information and research strategy between the respective agencies.
- **Decision Board** – comprised of senior managers from the core government transport agencies and other relevant agencies that conduct or commission transport-related research[13]. This group liaises with the Topic Hub Leads to make decisions on data, information and research priorities, and provides assistance and support to the CAGC.
- **Topic Hub Leads and Working Committee** – each of the Topic Hubs is comprised of 1-2 Hub Leads and a working committee representative from the wider transport sector. Hub Leads work with their members to make recommendations to the Decision Board in relation to identifying and addressing data, information, research and evaluation gaps.
- **Hub Members** – Membership is open to anyone working in government, the private sector, academia, not-for-profit, and individuals with an interest in transport.

11 https://www.transport.govt.nz/mot-resources/transport-knowledge-hub/

12 The CAGC is made up of senior officials from the Ministry of Transport, Waka Kotahi NZ Transport Agency, Maritime New Zealand, Civil Aviation Authority, Ministry of Business, Innovation and Employment, Local Government NZ, Auckland Transport, NZ Automobile Association, Universities New Zealand and Engineering New Zealand.

13 The Decision Board is made up of senior managers from Ministry of Transport, Waka Kotahi NZ Transport Agency, Maritime New Zealand, Civil Aviation Authority, Ministry of Business, Innovation and Employment, Local Government NZ, NZ Automobile Association, KiwiRail and NZ Police (pending).

FIGURE 6:
TRANSPORT KNOWLEDGE HUB GOVERNANCE

↔ Two-way communication between Topic Hubs and Decision Board on:

- Data and research needs and gaps
- Data and research priorities for the sector
- Collaborative data, research, and evaluation opportunities

Governance of the knowledge hub has three key purposes:

1. Lead the sector to develop and meet its transport knowledge needs, including helping to implement TEBS
2. Consider the wider domestic and international contexts and opportunities when implementing TEBS
3. Improve evidence-based decisions and capability building through information and knowledge sharing and development.

DOMAIN PLAN

GOAL AND PURPOSE

We want to have high-quality transport data, statistics and information to deliver a transport system that improves wellbeing and liveability.

GOAL

To ensure the right transport data, statistics and information are collected, managed and shared efficiently and effectively to deliver a transport system that improves wellbeing and liveability.

PURPOSE

The Domain Plan identifies what data is important to achieve better transport outcomes for New Zealand. It allows the transport sector to better coordinate how agencies collect and manage data and knowledge, and ensures existing information is visible, easy to use and maximises the value of data by enabling greater data-sharing and integration.

THE DOMAIN PLAN:

- Documents the statistical and information needs identified by the sector to answer the big transport policy questions
- Summarises the solutions identified by the sector to improve and maximise the value and usefulness of data, statistics and information
- Describes the methodology for prioritising the recommended initiatives and identifies the actions required for implementing these
- Identifies the high-priority initiatives, categorises these into clusters to eliminate overlaps, and summarises them by transport outcome.

It provides a macro-level review of the data, statistics and information needed to understand our transport system and to make the evidence-based transport decisions that will lead to better outcomes for New Zealanders.

THE VALUE OF DATA AND INFORMATION FOR NEW ZEALAND

More data is available than ever before. Unlocking the value of data and information will enable improved outcomes for all New Zealanders. Data can be used to solve complex problems, generate innovative ideas, and unlock public and private value. Data can provide new insights to inform policy decisions and shape the design and delivery of government services. Access to government-held data and information will also enable others across society to generate fresh insights and creates new opportunities for research and innovation.

The Data Strategy and Roadmap for New Zealand[14], commissioned by the Chief Government Data Steward, was released in December 2018. It provides a shared direction and plan for New Zealand's data system including the people and organisations that collect and use data.

This identifies opportunities that will enable organisations within and outside of government to connect data initiatives and work together, and align their efforts, to generate the maximum impact and value through data. This recognises the importance of:

- Investing in making the right data available at the right time
- Growing data capability and support for good practice
- Building partnerships within and outside government
- Implementing open and transparent practices.

A number of cross-government initiatives are already underway to harness these opportunities. Government transport agencies are working together closely to ensure quality data and information is available, data can be safely and securely accessed, and public trust and confidence is enhanced.

FULL LIST OF RECOMMENDED INITIATIVES

This, the updated Domain Plan, should be read in conjunction with the *Transport Domain Plan Full List of Recommendations*[15] developed as part of the original Domain Plan in 2016. This document provides a full record of the recommended initiatives and includes:

- A one-page overview of the findings of the gap analysis and the assessment results of the recommended initiatives
- A full description of each recommended initiative including the purpose, the problem definition or knowledge development opportunity, the response and a cross reference to appropriate enduring questions and related initiatives
- The initiatives categorised into high and medium priorities for the sector to pursue over the short to medium term.

IMPROVE ACCESS	IMPROVE GOVERNANCE	INVEST IN THE RIGHT ACTIVITIES	FACILITATE COLLABORATION	DEVELOP CAPACITY AND CAPABILITY
Existing data and information is discoverable, accessible and reusable, and its value is maximised at agency level	Data and information is collected, managed, and shared in a consistent manner and able to be used	We are able to close priority data and information gaps where the collection of new data or additional data is required	There is an increase in the number of cross-government and public-private data-sharing partnerships	The sector has the necessary skills and capabilities to collect, analyse and disseminate data and information products

14 https://www.data.govt.nz/assets/Uploads/Data-Strategy-and-Roadmap-Publish-Dec-2018.pdf
15 https://www.transport.govt.nz/assets/Uploads/Research/Documents/78c3678af6/Transport-Domain-Plan-full-list-of-recommended-initiatives.pdf

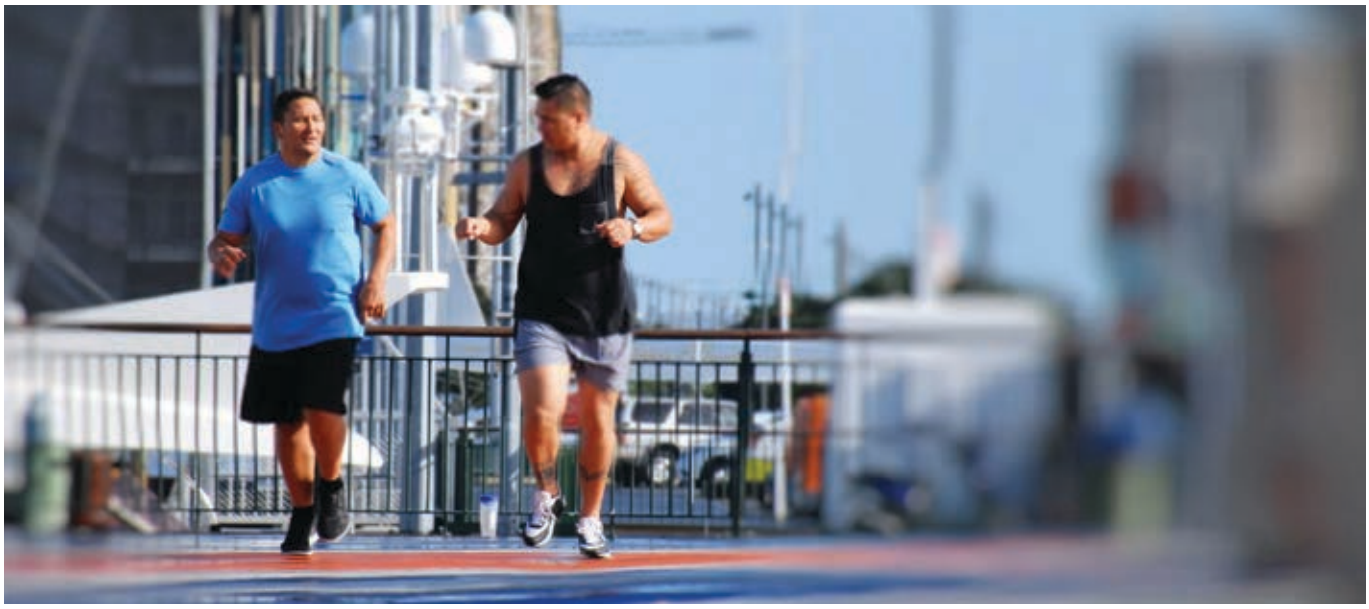
RECOMMENDED INITIATIVES

OVERARCHING RECOMMENDED INITIATIVES

The overarching recommended initiatives in Table 2 are the actions required to enhance the availability, governance and use of high-quality transport data, statistics and information[16].

TABLE 2: DOMAIN PLAN OVERARCHING RECOMMENDED INITIATIVES

Enabler	Initiative	Comments
Improve access	Improve access, reuse and sharing of data and information through the open release of government data	New initiative to ensure alignment with relevant New Zealand open data policies endorsed by Cabinet[17] and the New Zealand Open Data Action Plan[18]
Improve governance	Adopt common transport data standards, practices and inventories to improve collection, management, interoperability and sharing of data	Replaces H5 and H1 E (Domain Plan 2016) and ensures alignment with the New Zealand Data Strategy and Roadmap[19]
Invest in the right activities	Incorporate priority data and information initiatives in government transport agency future work programmes	The knowledge hub governance structure provides the necessary framework to enable coordination of investment activities at operational, management and executive levels
Facilitate collaboration	Advance cross-government and public-private data-sharing partnerships	Replaces H9 (Domain Plan 2016) and ensures an approach is developed for partnering with the private sector
Develop capacity and capability	Develop a coordinated approach to building data capability across the government transport agencies[20]	New initiative following stakeholder workshops in 2018



16 Replaces the 'overarching initiatives' on page 19 of the Domain Plan 2016
17 https://www.data.govt.nz/open-data/open-data-policy/
18 https://www.data.govt.nz/assets/Uploads/NZ-open-data-action-plan-Nov2018.pdf
19 https://www.data.govt.nz/assets/Uploads/data-strategy-and-roadmap-dec-18.pdf
20 'Data capability' refers to the range of skills, processes and tools required to effectively work with and use data as per the Stats NZ Data Strategy and Roadmap.

HIGH-PRIORITY DATA INITIATIVES

These are the high-priority initiatives required to fill the most important data and information gaps[21] to answer the enduring questions (in Appendix 3) and future focused questions (page 14) facing the transport system (refer Table 3).

TABLE 3: SUMMARY OF TOP HIGH-PRIORITY INITIATIVES[22]

	Recommended initiative	Enduring Question/s
	Economic prosperity: Encouraging economic activity via local, regional, and international connections, with efficient movements of people and products	
R3.2	Develop an agreed approach and set of indicators for monitoring freight efficiency	EQ 3.4, EQ 9.3
R3.9 E	Improve collection and access to data about the movement of freight. This includes: ‣ repeat and enhance the National Freight Demand Study (R3.9) ‣ domestic air freight (R3.10) ‣ Cook Strait freight and rail operators (R3.12 and R1.12) ‣ unrecorded light and urban freight (R3.5 and R3.7)	EQ1.2, EQ1.4, EQ3.1, EQ3.2, EQ3.3, EQ9.3, EQ9.4, EQ9.5
R6.2 E	Improve information on the cost of providing, operating and maintaining the transport network. This includes access to: ‣ data on the rail network (R6.8) ‣ developing a transport infrastructure performance benchmarking tool or framework (R4.4).	EQ4.1,EQ4.4, EQ6.1, EQ6.4, EQ9.1, EQ9.2
R4.1 E	Research into the monetary and non-monetary returns on investment in transport infrastructure at a network level (this combines with recommended initiative R4.18)	EQ4.2, EQ9.1, EQ9.5
R4.14	Integrate road assessment and maintenance management (RAMM) data and improve its access	EQ4.1
R9.2 E	Improve economic modelling oversight (R9.2) and a set of baseline assumptions (R4.2)	EQ4.2, EQ4.4, EQ9.1, EQ9.2, EQ9.5
	Environmental sustainability: Transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality, and air quality	
R11.1	Research into transport emissions profiles	EQ 1.3, EQ 11.1
R11.2	Develop environmental impact framework for maintaining or improving biodiversity, water quality and air quality	EQ 11.1
R1.1 E	Regularly publish vehicle fleet profiles, across all modes (includes R1.4, R1.8, R1.9, R1.10 and R1.11)	EQ1.1, EQ1.2
R11.9	Improve environmental impact evaluation around run-off of vehicle pollutants on road	EQ11.1
	Healthy and safe people: Protecting people from transport-related injuries and harmful pollution, and making active travel an attractive option	
R10.1	Develop health and safety risk profiles and exposures that leads to transport-related harm	EQ10.2
R10.3	Review methods for updating the Value of Statistical Life (VoSL)	EQ10.3
R2.13	Gather additional information about pedestrian and active mode person travel (walking and cycling)	EQ2.1
R10.6	Align injury classification definitions across different datasets	EQ10.2
	Inclusive access: Enabling all people to participate in society through access to social and economic opportunities, such as work, education, and healthcare	
R2.14	Improve information on and understanding of Māori[23] views and needs from use of, and involvement in, transport	EQ2.1, EQ2.2, EQ2.3, EQ2.4
R2.4	Establish baseline information on 'accessibility'	EQ2.2
R2.8 E	Gather additional information on people's attitudes, preferences and perceptions about transport (including research on why people don't (or can't) travel (R2.7))	EQ2.3, EQ2.2
R5.2	Integrate transport system and land use data for improved land use planning	EQ5.1, EQ5.2, EQ 5.4, EQ5.5
R2.6	Improve access to high-quality public transport patronage data	EQ2.1
R3.6 E	Develop geospatial capability to track freight and people movements This includes establishing data partnerships with freight operators (R3.6) and develop approach for collecting data on people movements (R1.14)	EQ3.1, EQ3.2, EQ3.3, EQ9.5
R2.1	Improve awareness of and access to information from the New Zealand Household Travel Survey	EQ 2.1
	Resilience and security: Minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events	
R5.1	Develop sector definition of resilience	EQ 5.6
R11.10	Collect information on impacts of weather and environmental-related network outages	EQ11.2
R4.19	Improve information on the capacity and use of local roads	EQ 4.1

Key	
E	Cluster of initiatives as an extension of a specific individual initiative

21 Replaces the 'Quick wins and high-priority initiatives' on page 20-26 of the Domain Plan 2016. By applying the 3-Step, we confirmed the majority of high-priority initiatives in the Domain Plan still remain a priority with 1 new high-priority added (R10.3)

22 A summarised list of all 24 high-priority initiatives by outcome and enabler is available in Appendix 5.

23 Inclusive of information on iwi, hapū and whānau

RESEARCH STRATEGY

GOAL AND PURPOSE

Creating a research environment to maximise the benefits from transport-related research.

GOAL

To create a research environment that maximises the benefits from transport-related research and contributes to delivery of a transport system that improves wellbeing and liveability.

PURPOSE

To provide a structure for fostering a more effective and efficient research environment. The Research Strategy gives clear guidance on transport research direction as well as a way of collaborating across the diverse research community to work together into the future. Its purpose is to:

- Define the mechanisms for fostering a more effective and efficient research environment
- Act as a reference document to guide research development and prioritisation
- Provide clear transport research direction to the sector
- Propose a new way of working into the future.

At a basic level, the Research Strategy provides guidance to answer 4 questions:

1. Why do this research?
2. What is the right research?
3. How should this research be done?
4. How do we better use this research for decision-making?

THE RESEARCH STRATEGY

Once fully implemented, the Research Strategy will ensure research is fully used to contribute to our understanding of the transport system, how it works, and the barriers to its use, so that together we can deliver the desired transport outcomes.

The research community is diverse and consists of:

- Research professionals from the academic, public, non-government and private sectors
- Funding agencies including the Transport Agency, Ministry of Business, Innovation and Employment (MBIE), Health Research Council (HRC) and the Royal Society Te Apārangi
- Government transport agencies who prioritise research to fill knowledge gaps

Research undertaken by these sectors covers many disciplines including economics, engineering, transport planning, social sciences, humanities, population health, and more.

CONTRIBUTING TO OUR UNDERSTANDING OF THE TRANSPORT SYSTEM

Changes in technology, travel patterns and behaviour affect both short- and long-term transport demands. Accordingly, research and information that improves our ability to understand and predict such changes is important. Research and information play a key role in shaping the policy landscape.

IMPROVE ACCESS	IMPROVE GOVERNANCE	INVEST IN THE RIGHT ACTIVITIES	FACILITATE COLLABORATION	DEVELOP CAPACITY AND CAPABILITY
Research inputs and results are available to the wider community	There is coordination and prioritisation of research activities and funding opportunities across the wider research community	There is clear guidance on how to identify priorities for transport research to achieve transport outcomes	There is a systematic approach to building and maintaining interests in transport research across the wider research sector	There is a thriving research community with the necessary capability and capacity to produce high-quality research that contributes to transport outcomes

RECOMMENDED INITIATIVES

OVERARCHING RECOMMENDED INITIATIVES

The overarching recommended initiatives in Table 4 are the actions required to enhance the availability and reuse of research.

TABLE 4: RESEARCH STRATEGY OVERARCHING RECOMMENDED INITIATIVES

Enabler	Initiative	Comments
Improve access	Adopt the New Zealand Research Information System (NRIS) for recording information about all publicly funded transport-related research	Improves discoverability, visibility and reuse of research; transparency of funding; and enhances knowledge about the New Zealand transport research community
Improve governance	Implement Transport Knowledge Hub Decision Board to improve coordination of research initiatives	Ensures representation of key government transport agencies and stakeholders
Invest in the right activities	Establish process to prioritise and commission research initiatives	Includes review of research funding identified as a key initiative following feedback from the wider transport sector during the refresh workshops in 2018
Facilitate collaboration	Develop a coordinated transport research community inclusive of researchers, funders and government agencies	Enables engagement with other government agencies and opportunities for the identification of cross-government research (e.g. Ministry of Health, Ministry for the Environment)
Develop capacity and capability	Promote participation in international research programmes and provide support for post-graduate transport researchers	Improves connections with overseas research professionals, institutes and organisations[24], and helps to create a more effective and efficient research environment in New Zealand

24 E.g. International Transport Forum (ITF), AustRoads, iMOVE (http://imovecrc.com/)

RESEARCH PRIORITIES

The recommended research priorities have been developed to provide the transport sector with a comprehensive view of research-related knowledge gaps to answer the enduring questions (in Appendix 3) and future focused questions (page 14) facing the transport system. These were identified through stakeholder engagement and are available in Table 5. Where there are overlaps with the Domain Plan, the corresponding recommended initiative has also been included for reference[25].

TABLE 5: RESEARCH PRIORITIES BASED ON TRANSPORT OUTCOMES[26]

	Transport outcome and research need	EQ[27]	Priority research topics
	Overarching		
1.0	Transport's contribution to wellbeing and liveability	New	How does transport contribute, positively or negatively, to wellbeing and to liveability of people living in New Zealand's cities, towns and rural areas?
		New	What is the impact of transport on life satisfaction measures?
2.0	The impact of new technology and innovations	New	Improve our understanding of changes in transport demand from the uptake of new technology and innovations (such as electric vehicles, e-bikes, e-scooters, and new and emerging transport modes).
		New	What is the impact, and who is most affected, by the shift to new modes of travel?
	Economic prosperity: Encouraging economic activity via local, regional, and international connections, with efficient movements of people and products		
3.1	Relationship between transport and the economy	EQ9.5, EQ5.2	What is the relationship between the location of the transport network and transport services, and economic activity in New Zealand?
		EQ5.3	What is the impact of transport network connectivity on economic productivity?
3.2	Transport-related economic costs and benefits	EQ9.1	What are the main sources, types and quantities of economic costs and benefits from transport? (R9.2 R4.1)
		EQ9.2	How are economic costs and benefits of transport distributed? And how do they change over time? (R9.2/R4.1)
3.3	Return on transport investment	EQ4.2, EQ9.2	Improve understanding of the return on investment in the transport system, including monetary and non-monetary returns (R4.1/R4.18)
		EQ4.3	How do we achieve intergenerational equity?
	Environmental sustainability: Transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality, and air quality		
4.1	Measurement of environmental emissions	EQ11.1	What are the transport emissions profiles across all modes (air, land, and sea), emission type, vehicle type and industry? (R11.1)
		EQ11.1	How do we monitor the environmental impacts of transport emissions?
			What is the contribution of transport to the low-carbon economy?
4.2	Measurement of environmental impacts	EQ11.1	What are the impacts of the transport system (all modes) on the environment?
			How do we quantify the environmental cost from transport?
4.3	Reduce transport-related environmental impacts	EQ11.1	How do we develop an environmental impact framework? (R11.2)
		EQ11.1	What is the effectiveness of interventions to reduce transport-related environmental impacts (including greenhouse gas emissions)?
		EQ11.3	How does the transport system mitigate climate change impacts?
	Healthy and safe people: Protecting people from transport-related injuries and harmful pollution, and making active travel an attractive option		
5.1	People's attitudes and perceptions on travel	EQ2.3	What attitudes, perceptions and preferences do people have toward different transport modes?
		EQ2.3	What are the reasons for personal attitudes, perceptions and preferences that impact on travel choices?
		EQ2.3	What is the influence of infrastructure type and availability on active travel?
5.2	Relationships between transport and harms	New	Impact on safety outcomes of prescription drugs and medicinal cannabis.
		EQ10.2	What factors contribute to risk of harm and in what quantities and proportions?
		New	What is the effectiveness of safety interventions?
		New	How many near misses across modes (and reasons for not resulting in an injury)?
		EQ10.2	What is the risk exposure by mode?
5.3	Relationship between transport and health	EQ10.3	What are the sources and types of health impacts from transport?
			What are the harms and benefits of these impacts?
		EQ10.3	How do we quantify the cost (including social cost) to human health?
		New	How can transport improve mental health outcomes?

25 The list of future research needs was identified from the Ministry of Transport's transport outcomes indicators workshops with stakeholders (held October/November 2018) and incorporates research-related high-priority initiatives from the Domain Plan identified by the corresponding 'R number' from the Domain Plan Full List of Recommended Initiatives.

26 A summarised list of the research initiatives and priorities by outcome is available in Appendix 6.

27 EQ = Enduring Questions – refer Appendix 3 for the full list

	Transport outcome and research need	EQ[27]	Priority research topics
	**Inclusive access: Enabling all people to participate in society through access to social and economic opportunities, such as work, education, and healthcare**		
6.1	Reasons for travel and transport and non-travel choices	EQ2.2	Who experiences barriers to access or use?
		EQ2.2	What are the barriers to access and use and how are these changing?
		EQ2.2	What is the access to transport options by people with different income levels and geographical/ residential distribution?
		EQ2.2	Why people don't (or can't) travel (R2.7)?
		EQ2.3	What is people's accessibility threshold?
6.2	Relationship between transport and land-use planning	EQ5.1	How well connected are different parts/modes of the transport system? (R5.2)
		EQ5.2	How does land use affect the different transport modes? (R5.2)
6.3	Improve understanding of Māori views and needs	EQ2.4	How can we improve information on and understanding of Māori needs from, view and use of, and involvement in transport? (R2.14)
	**Resilience and security: Minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events**		
7.1	Interdependencies between transport and other infrastructure networks	EQ5.6	How do we improve understanding of the interdependencies between the transport system and other network infrastructure services? (R5.1)
		EQ5.6	What is the ability of the transport system to respond and recover from incidents or crises? (R5.1)
7.2	Resilience to environmental changes	EQ5.6	How do we improve understanding of the impact of the environment (including climate change) on the transport system? (R5.1)
		EQ11.2	How do communities adapt to climate change?
		EQ4.4	How do we safeguard infrastructure from the impacts of climate change?
		EQ4.4	How do we develop new transport infrastructure that is resilient to the impacts of climate change?
7.3	Measurement of direct and indirect costs and benefits	EQ5.6	How do we identify, incorporate and include the critical methods used to value resilience? (R5.1)
		EQ5.6	How do we identify and measure the different types of risk, uncertainties and options values? (R5.1)

27 EQ = Enduring Questions – refer Appendix 3 for the full list

EVALUATION STRATEGY

GOAL AND PURPOSE

We want to improve the generation and utilisation of robust evaluation findings in transport.

GOAL

To lift the amount and availability of quality evaluation, and develop a culture in New Zealand where evaluation is embedded in the development and implementation of transport-related decisions.

PURPOSE

To set out the overarching plan for the transport sector to better develop and disseminate evaluation findings. This Evaluation Strategy aims to:

- Develop an approach to evaluation that supports the transport sector to embed evaluation as part of the necessary transport evidence base, and consistently applies a formal evaluation framework to improve the relevance and utilisation of evaluation findings and recommendations.
- Provide guidance and tools to improve the consistency in how transport-related evaluation is approached across the sector, and encourage collaborative efforts.

A NEW STRATEGY ON EVALUATION

This Evaluation Strategy was developed to strengthen the transport sector's evidence-based approach by explaining the role of evaluation in the decision-making process and establishing a common evaluation approach. It is important the value of evaluation is understood by the sector, and initiatives are undertaken to provide a supportive environment for good-quality evaluation to occur.

This is the first time an evaluation strategy has been developed for the New Zealand transport sector. While evaluation is not a new concept to the sector, this Evaluation Strategy represents an increased focus on the importance of generating and utilising evaluation findings, and requires a significant improvement in resource allocation for the associated activities.

This Strategy focuses on establishing a common approach to guide evaluation undertaken by the government transport agencies and the wider transport sector. The Ministry of Transport (the Ministry) is committed to taking a lead role in coordinating and collaborating with the sector to implement this Evaluation Strategy with a phased approach. The first steps will involve developing: 1) the necessary capacity and capability within the Ministry to meet its evaluation needs, and 2) common templates and tools to improve consistency and encourage cross-agency collaboration.

This Evaluation Strategy is part of the *Transport Evidence Base Strategy*. An evidence-based approach requires the generation and utilisation of evidence throughout the decision-making life cycle. While there are other evidence-generating activities that serve important functions in providing the evidence to guide decision-making, this Strategy focuses on three main types of evaluation:

1. Formative evaluation
2. Process/implementation evaluation
3. Outcome/effectiveness evaluation.

IMPROVE ACCESS	IMPROVE GOVERNANCE	INVEST IN THE RIGHT ACTIVITIES	FACILITATE COLLABORATION	DEVELOP CAPACITY AND CAPABILITY
Evaluation findings are available and presented in a digestible way	Data and information is shared between agencies to reduce project cost, and improve consistency in evaluation findings by relying on a single source of truth	We are investing in the right evaluation to deliver the greatest contribution to the transport outcomes	The transport evaluation community is engaged to share knowledge, discuss challenges, and identify solutions	The sector has access to the right capability to identify, specify, deliver and understand evaluation

RECOMMENDED INITIATIVES

OVERARCHING RECOMMENDED INITIATIVES

The overarching recommended initiatives in Table 6 are the actions required to enhance the availability and reuse of evaluation.

TABLE 6:
RESEARCH STRATEGY OVERARCHING RECOMMENDED INITIATIVES

Enabler	Initiative	Comments
Improve access	Publish Ministry of Transport's evaluation findings, and develop a common platform to host transport-related evaluation outputs	Improves visibility and use of evaluation findings
Improve governance	Develop a repository of measures and indicators commonly used in transport evaluation, and data sources	Improves consistency in evaluation approach and findings; improves efficiency; encourages collaboration
Invest in the right activities	Use the 3-Step framework and the evaluation Guiding Principles to prioritise evaluation	Ensures that resources are appropriately allocated
Facilitate collaboration	Publish Ministry of Transport's work programme and provide platforms for evaluators to share knowledge, discuss challenges, and identify solutions	Encourages collaboration; improves the quality and consistency in evaluation practice across the sector
Develop capacity and capability	Incorporate evaluation concepts and processes into transport sector master classes/training and ensure templates and tools are made available to the sector	Improves knowledge of evaluation concepts and processes; improves access to templates and tools

THE ROLE OF EVALUATION WITHIN THE TRANSPORT SECTOR

Evaluation forms an important part of the transport evidence base. The descriptions below illustrate why the government transport agencies undertake evaluation.

The **Ministry's** role is to be a trusted, impartial and expert adviser to the Government. Given this role, there is a need to constantly generate evaluation findings to support decision-making. The four examples below illustrate how the Ministry has achieved these through collaborating with other organisations.

1 Governance Role in Transport

The Ministry has a governance role across the transport sector, including road, rail, aviation and maritime. This is achieved by setting a longer term strategic direction for the transport sector, and tracking sector performance and alignment with Government expectations.

Example 1:

The Ministry is responsible for establishing measures and reporting requirements for the Government Policy Statement on land transport (GPS). The analysis and reporting of the impact of the GPS requires collaboration between the Ministry and bodies delivering the GPS (e.g. Waka Kotahi NZ Transport Agency, New Zealand Police, local government).

2 System Leadership

The Ministry also has a system leadership role, being the only organisation with a role and remit that covers the multiple modes making up the transport system. In an evaluation context, system leadership means the ability to detect, consider, and evaluate substantive changes across the transport system and make information on such changes available to both decision makers and the wider sector.

Example 2:

Applying the Transport Outcomes Framework developed in 2018, the Ministry, with support from transport Crown agencies and other government agencies (e.g. New Zealand Police, WorkSafe, local government), is establishing an ongoing mechanism to track the state of the transport system over time.

3 Regulation, Policy and Investment Decisions

Demand for evaluation activity is also generated by regulation, policy and investment decisions. There is a need to structure evaluation plans into the regulation, policy, and/or investment life cycle. Learning from well-planned, robust evaluations allows the appropriate shift to more effective regulations, policies and investments.

Example 3:

The Ministry undertakes evaluation on specific regulation/policy/investment to determine its effectiveness. Examples include the evaluations of Road User Charges and the Graduated Driver Licensing System, both undertaken with support from Waka Kotahi NZ Transport Agency.

4 Other Government Requirements

The Ministry also has responsibility to meet other wider commitments, such as those stipulated through international obligations, or cross-government agencies initiatives and programmes.

Example 4:

The Ministry of Business, Innovation and Employment (MBIE) has overall responsibility for the Provincial Growth Fund (PGF). The Ministry of Transport and other relevant transport entities (e.g. Waka Kotahi NZ Transport Agency, KiwiRail) are involved to ensure relevant transport outcomes are appropriately measured and reported.

Transport Crown agencies[28] perform a variety of functions (e.g. regulatory, compliance, infrastructure development and maintenance) to deliver Government's priorities. Regardless of their function, there is a need to undertake robust evaluation to examine their effectiveness and efficiency in delivering their functions and identify opportunities for future improvements.

5 Provide Assurance

Transport Crown agencies are required to provide assurance they are meeting the expectations set by the Government. One way to do this is through their mandatory reporting requirements, such as the Statement of Intent and Statement of Performance Expectations, which often include an evaluation component.

Example 5:

Civil Aviation Authority and Maritime New Zealand both indicate in their Statement of Performance Expectations the commitment to evaluate the impact of their outreach/education programme on people's understanding of aviation/ maritime safety.

6 Identify Opportunities to Future Improvements

Apart from meeting the mandatory reporting requirements, evaluation also provides an avenue for transport Crown agencies to seek continuous improvement in the way they carry out their functions. Evaluation may focus on the appropriateness, effectiveness and/or efficiency of the activities they undertake or oversee. Taking an active role in evaluation demonstrates the organisation's willingness to hold themselves accountable for their activities, and openness to improve how they deliver their functions. These activities in turn enhance transport outcomes.

Example 6:

Waka Kotahi NZ Transport Agency regularly conducts post-implementation reviews to 1) assess how well a project (or package) has delivered its expected benefits, 2) explain any variations between actual results and expected benefits and costs, and 3) identify any lessons learnt that can be used to improve future projects.

28 Civil Aviation Authority, Maritime New Zealand, Waka Kotahi NZ Transport Agency and Transport Accident Investigation Commission (TAIC)

DEVELOPING A COMMON APPROACH

GUIDING PRINCIPLES OF EVALUATION

Six Guiding Principles of evaluation are provided in Table 7 below to support the utilisation of a common approach to evaluation across the sector.

The principles cover three areas: organisational culture on evidence-based decision-making, the way evaluation is designed and conducted, and the way evaluation findings are communicated to and used by different audiences.

TABLE 7: THE GUIDING PRINCIPLES OF EVALUATION[29]

Evaluations should be...	Description of each Guiding Principle
Integrated	Evaluation is a core function and not a compliance activity. Create an evidence-based culture within the organisation which values the use of high-quality evaluation protocols within the decision-making life cycle. This means that: ‣ Evaluation planning is undertaken before the implementation phase ‣ Evaluation activities are complemented by an appropriate monitoring regime ‣ Evaluation findings are communicated widely to inform decision-making and proposal development and refinement.
Fit for purpose	The scale of effort and resources allocated to an evaluation is proportional to the value, impact, strategic importance and risk profile of a project. This means that: ‣ The appropriate evaluation method is selected according to the scale of the project, the project life cycle, feasibility of the method, data availability, and value for money. ‣ The use of resources (including people, data, and tools) that are readily available is maximised.
High quality	Robust evaluation and analytical methods are used, and findings are interpreted within the context. To achieve this, people undertaking and/or managing these evaluations need to be appropriately skilled and experienced in evaluation, and are supported by subject matter experts.
Timely and applicable	Evaluation findings are available in a timely fashion and in a format that is digestible and applicable to their end users (e.g. policy analysts, regulators, practitioners). Discussions on evaluation findings are facilitated by the evaluation commissioner to ensure relevant stakeholders can reflect on and learn from the findings and apply them appropriately.
Transparent	Evaluation reports are published online to provide transparency and support public debate, unless there are strong reasons to limit circulation (e.g. contain information that is commercially sensitive).
Independent	Staff undertaking and/or managing evaluations have a level of independence from the responsible regulation/policy/investment areas. External peer reviews are sought where appropriate.

29 Adapted from Australian Research Council (2018). ARC Evaluation Strategy. Canberra: Australian Government.

EMBEDDING EVALUATION INTO THE DECISION-MAKING PROCESS

One of the key objectives of this Evaluation Strategy is to support the transport sector to embed evaluation into their day-to-day decision-making process. Undertaking robust evaluation improves the available transport evidence base and ultimately improves the quality of advice and associated decision-making.

The decision-making life cycle on page 13 shows how different evidence-generating activities, including evaluation, are embedded into an evidence-based decision-making. The life cycle also reflects best practice in evaluation planning. While the majority of evaluation occurs after the implementation phase (i.e. process/implementation evaluation and outcome/effectiveness evaluation), decisions around the need and scope of evaluation should be considered prior to implementation. This planning activity is sometimes referred to as an 'evaluability assessment'.[30]

Establishing the evaluation requirements early:

- Helps ensure the expected outcomes are identified and clearly articulated (e.g. through the use of an intervention logic model)
- Ensures resourcing requirements are considered and accounted for
- Improves the ability to consider more robust evaluation methods to determine attribution
- Allows for time to identify and collect baseline data
- Helps identify relevant stakeholders and their information needs, and the potential utility of the evaluation findings.

The decision-making life cycle also makes references to the three types of evaluations that are most commonly undertaken:

- **Formative evaluation** is introduced at the option development phase. This type of evaluation assesses the feasibility of identified options and identifies elements of successful factors. It may also assess perception and acceptability of identified options, and therefore helps with identifying associated risks and mitigation strategies.
- **Process evaluation** usually occurs during early implementation to assess the alignment between the intent and realisation in application, and identify barriers and facilitators to implementation.
- **Outcome evaluation** assesses what happened after the implementation of a project, i.e. whether the project has met its intended objectives (and how well). This may also include assessing the overall outcome at a level including population segmentation. Outcome evaluation can be undertaken any time after implementation to assess its immediate, medium- or long-term impact.

We acknowledge that there may be additional evaluation activities that do not fall neatly into this 3-level scheme, but the Guiding Principles from the previous section still apply.

30 Davies, R. (2015). Evaluability Assessment. Better Evaluation.

LINKING TO THE TRANSPORT OUTCOMES FRAMEWORK

The *Transport Outcomes Framework* [refer page 11] provides a common framework for the sector to systematically consider, assess, and explain: 1) the transport system performance, and 2) the outcomes of transport-related regulation, policy and investment decisions.

An evaluation plan must acknowledge and be assessed against the relevant transport outcomes to demonstrate awareness of the range of potential impacts. The need to demonstrate how transport-related decisions deliver the transport outcomes demands new thinking about how to undertake evaluation, and requires us to actively collaborate with both transport and non-transport organisations to develop appropriate indicators to orient and track progress and impacts for each outcome. Where appropriate, multiple transport outcomes are assessed in order to take into account potential co-benefits and trade-offs.

The *Transport Outcomes Framework* should be the primary tool when considering the impact of transport-related decisions. The implementation of the *Transport Outcomes Framework* is one way to foster collaboration with non-transport organisations by highlighting the role of transport as an enabler and the range of outcomes that could be derived from transport regulation, policy and investments. However, we acknowledge it would be useful to also seek alignment with other frameworks (e.g. the Treasury's *Living Standards Framework*[31] and Statistics New Zealand's *Indicators Aotearoa New Zealand*[32]), particularly when considering the impact of cross-government initiatives. In some cases, this could be achieved by disaggregating and presenting measures in different ways. In other cases, additional outcomes measures may be included.

IMPLEMENTATION OF THE EVALUATION STRATEGY

Successful implementation of this Strategy will require significant contribution and collaboration of the transport sector, including government and non-government organisations.

To facilitate this process, future initiatives based on the evaluation enablers are discussed in the next section – Next Steps.

31 https://treasury.govt.nz/information-and-services/nz-economy/living-standards/our-living-standards-framework
32 https://www.stats.govt.nz/indicators-and-snapshots/indicators-aotearoa-new-zealand-nga-tutohu-aotearoa/

NEXT STEPS

IMPLEMENTING THE TRANSPORT EVIDENCE BASE

TEBS identifies the key data, information, research and evaluation priorities and initiatives to ensure that the right transport-related evidence is available for the sector.

Having sufficient and reliable transport evidence will enable the transport sector to make evidence-based policy, strategy and decisions into the future to deliver the desired transport system.

Implementation of TEBS is the joint responsibility of the government transport agencies inclusive of the Ministry of Transport, Waka Kotahi NZ Transport Agency, Maritime New Zealand, and Civil Aviation Authority. Successful implementation of the high-priority initiatives identified in this strategy will require development of a collaborative, coordinated approach as follows:

1. DEVELOP THE TEBS IMPLEMENTATION & ACTION PLAN

The transport agencies identified above will collectively develop an implementation and action plan with Local Government New Zealand and other key stakeholders from the wider transport sector. This will set out a 3-year work programme to:

- Implement the recommended initiatives, inclusive of the overarching and high-priority initiatives, identified in this strategy (refer Table 8 for summary of the overarching initiatives from each of the respective strategies and plans within TEBS)
- Identify individual and collaborative responsibilities – this includes scoping resource requirements, indicative costs (where appropriate) and time-frame for delivery
- Agree reporting structure (e.g. progress on filling knowledge gaps and/or assessment metrics).

This will incorporate ongoing reviews and updates, and be updated and agreed annually by the respective agencies.

2. INCORPORATE INTO INDIVIDUAL AGENCY WORK PROGRAMMES

The Ministry will continue to support coordination of the efforts across the sector to develop the implementation plan as well as maintaining oversight of the implementation process. It is envisaged some organisations may take responsibility for delivering some specific priorities. It is a collaborative responsibility to ensure we are working together to deliver TEBS.

The Ministry, for example, will incorporate respective elements of the implementation plan where responsibility is assigned to the Ministry, within its own internal work programme and assign responsibility accordingly.

3. REVIEWING AND MONITORING TEBS

An important part of any strategy is to be able to assess if and when the planned initiatives have been delivered and whether the expected benefits have accrued. A periodic review will identify what works and what doesn't. Continuous improvement from the lessons learned is a key part of any successful strategy and is built in from the outset.

An agreed approach to assessment of success and development of a set of actions to monitor and evaluate success in implementing the TEBS should also be established as part of the initial implementation planning process. This may include actions such as developing assessment metrics to track changes in:

- The number of enduring questions that can be answered
- Visibility of transport-related research
- The number of inter-agency secondments and training workshops
- Understanding of the role of data, research and evaluation in project development cycle
- Ease of identifying and accessing the transport evidence base to inform government policy

TEBS will be reviewed annually, with a full review of progress taking place every 3 years starting in late 2022.

TABLE 8:
SUMMARY OF THE TRANSPORT EVIDENCE BASE STRATEGY OVERARCHING INITIATIVES

Enabler	Objective	Overarching initiatives		
		Domain Plan	Research Strategy	Evaluation Strategy
Improve access	Ensure data, research and evaluation findings are discoverable, accessible and reusable	Improve access, reuse and sharing of data and information through the open release of government data	Adopt the New Zealand Research Information System (NRIS) for recording information about all publicly funded transport-related research	Publish Ministry of Transport's evaluation findings, and develop a common platform to host transport-related evaluation outputs
Improve governance	Ensure sharing, integration, and governance of key data and information products	Adopt common transport data standards, practices and inventories to improve collection, management, interoperability and sharing of data	Implement Transport Knowledge Hub Decision (Evidence) Board to improve coordination of research initiatives	Develop a repository of measures and indicators commonly used in transport evaluation, and data sources
Invest in the right activities	Ensure we invest in the right activities and projects	Incorporate priority data and information initiatives in government transport agency future work programmes	Establish process to prioritise and commission research initiatives	Use the 3-Step framework and the evaluation Guiding Principles to prioritise evaluation
Facilitate collaboration	Foster cross-agency collaboration and relationships with the wider transport sector	Advance cross-government and public-private data-sharing partnerships	Develop a coordinated transport research community inclusive of researchers, funders and government transport agencies	Publish Ministry of Transport's work programme and provide platforms for evaluators to share knowledge, discuss challenges, and identify solutions
Develop capacity and capability	Ensure that the sector has access to the right skills and knowledge	Develop a coordinated approach to building data capability across the transport sector agencies	Promote participation in international research programmes and provide support for post-graduate transport researchers	Incorporate evaluation concepts and processes into transport sector master classes/training and ensure templates and tools are made available to the sector

APPENDICES

APPENDIX 1:

STAKEHOLDER ENGAGEMENT

Development of the *Transport Evidence Base Strategy* (TEBS) required knowledge from a wide range of subject matter experts. Engagement activities included:

1. Series of stakeholder meetings and workshops held in 2018, these included:
   a. Domain Plan and Research Strategy refresh workshops
   b. Transport Outcomes Indicators workshops
   c. GPS Measures workshops
2. Consultation on the draft TEBS in early 2019 to seek feedback from the wider transport sector prior to release of the final document.

The following organisations have participated in various stages in the development of TEBS:

Airways	Ministry of Health
Auckland Transport	Ministry of Housing and Urban Development
Auckland Council	Ministry for Primary Industries
Bus & Coach	Ministry of Transport
Civil Aviation Authority	National Energy Research Institute
Department of the Prime Minister and Cabinet	Ministry for the Environment
Disabled Persons Assembly NZ*	National Institute of Water and Atmospheric Research
Engineering New Zealand	New Zealand Automobile Association
Environment Canterbury	New Zealand Police
Environment Southland	New Zealand Treasury*
Greater Wellington Regional Council	Productivity Commission
KiwiRail	Road Transport Forum New Zealand
Land Information New Zealand	Stats NZ
Living Streets Aotearoa*	The University of Auckland
Local Government New Zealand	University of Otago
Maritime New Zealand	Waka Kotahi NZ Transport Agency
Met Service	WSP Opus
Ministry of Business, Innovation and Employment	
Ministry of Civil Defence and Emergency Management	

* Provided feedback during consultation stage only

The inputs from these organisations are gratefully acknowledged.

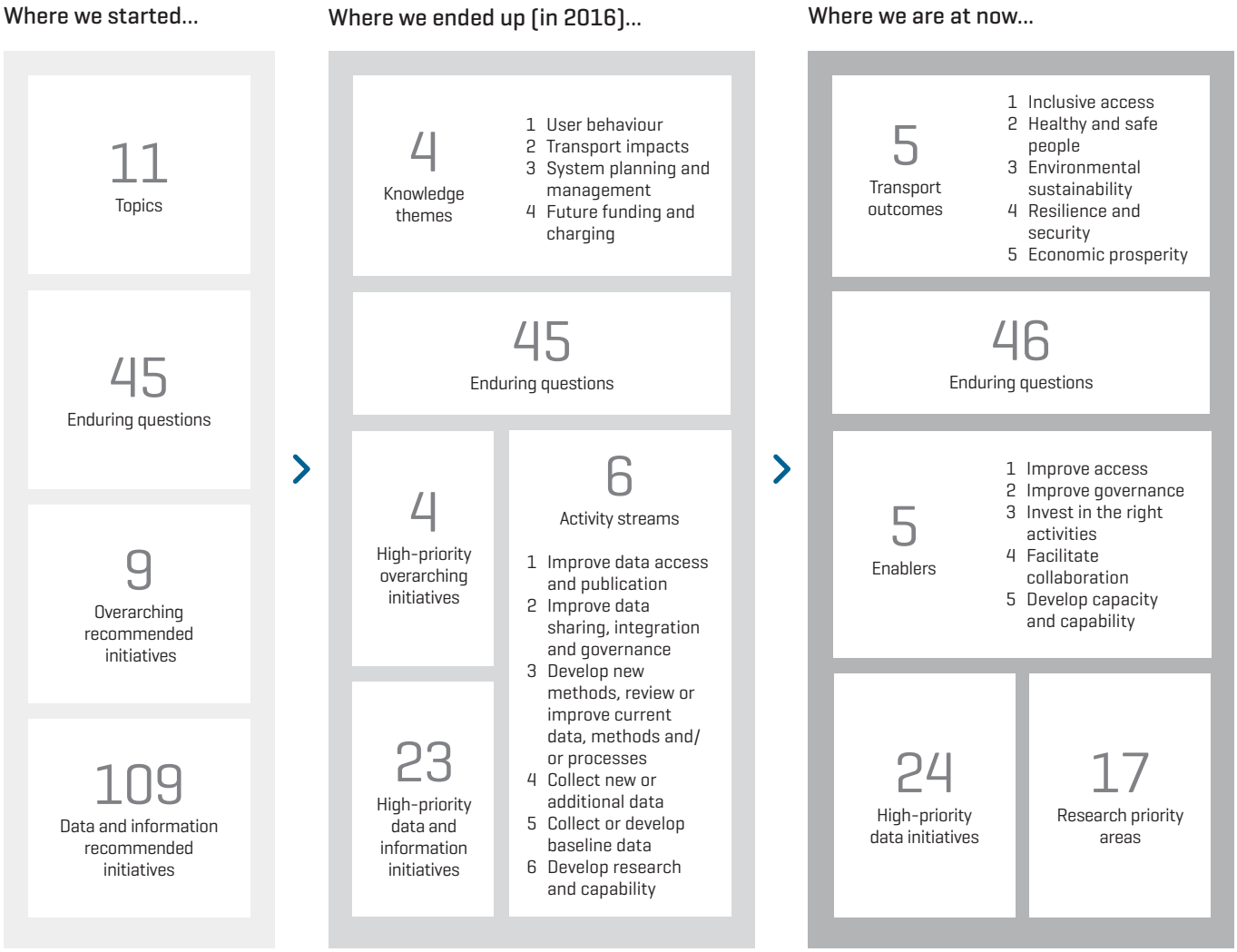
APPENDIX 2:

UPDATES TO THE DOMAIN PLAN AND RESEARCH STRATEGY

SUMMARY OF DOMAIN PLAN AND RESEARCH STRATEGY UPDATES

A summary of the Domain Plan and Research Strategy journey from planning and publication in 2016 to the refresh in 2019 is illustrated in the Figure 7.

FIGURE 7:
SUMMARY OF THE DOMAIN PLAN AND RESEARCH STRATEGY UPDATES



DOMAIN PLAN AND RESEARCH STRATEGY UPDATES IN DETAIL

Stakeholder feedback received during the refresh workshops suggested the core foundation and frameworks provided in the Domain Plan and Research Strategy were solid and still valid, although perhaps a little complex to implement. For this reason, we have sought to simplify the number of frameworks and have made the following changes and updates to the original Domain Plan and Research Strategy following the refresh project include:

- Replaced the Knowledge Themes with the new transport outcomes as a way of categorising data, information and evaluation needs that can be easily communicated to the wider sector
- The **3-Step** (on page 18) replaces the Triple-4 and has been updated to reflect the new transport outcomes and extend its intended scope of use to include investment in data, research and evaluation activities.

- Domain Plan:
  - A number of minor amendments, and one new question, have been made to the **Enduring Questions** to ensure these also reflect future challenges facing the transport system:
    - Topic 4: Infrastructure and investment:
      - EQ4.4 – amended to include 'How to safeguard transport infrastructure from the impacts of climate change?'
      - Topic description (Appendix 4) updated to include 'and how to safeguard transport infrastructure from the impacts of climate change'
    - Topic 11: Environment
      - EQ 11.1 – amended to include 'how can this (environmental outcomes) be improved'
      - Addition of EQ11.3 (new) – 'What are the implications of climate change impacts and greenhouse gas mitigation targets for the transport system, including spatially, modally and temporally? And what changes are needed for the transport system to effectively respond to climate change mitigation and adaptation related challenges?'
      - Topic description (Appendix 4) updated to include 'climate change'
    - Topic 5: Transport Integration and network resilience
      - Topic description (Appendix 4) updated to include 'and adapting to emerging threat'
  - Minor updates to the Topics':
    - Topic 4: Infrastructure and Investment
  - Replaced the Activity Streams with the Enablers (refer Table 1)
  - Replaced the over-arching initiatives[33] with a new table that links the overarching recommended initiatives with the Enablers (refer Table 2)
  - High-priority initiatives have been re-prioritised and updated (refer Table 3) with one new high-priority added (R10.3).

- Research Strategy:
  - Updated **goal** to reflect the updated Government priorities for transport and the transport outcomes and **purpose** to improve the linkage between research and policy.
  - Development of the new 'overarching recommended initiatives' (refer Table 4) based on the Enablers with the purpose of aiding implementation of the Research Strategy.
  - The research focus areas[34] have been superseded with a list of research priorities (refer Table 5).

33 In Figure 6 – Domain Plan 2016
34 Figure 7 on page 16 of the Research Strategy 2016-2020

APPENDIX 3:

ENDURING QUESTIONS

Key:	
🟢	Small knowledge gap
🟡	Medium knowledge gap
🟠	Large knowledge gap
EQ[35]	Description of enduring question

Topic 1: Transport Fleet		
EQ 1.1	What is the size, age, condition, capacity, capability and modal composition of New Zealand's domestic and international transport fleet, and how are these things changing, including regionally, nationally and temporally?	🟢
EQ 1.2	How is the fleet being used and how is this changing, including modally, temporally, regionally and nationally?	🟠
EQ 1.3	How much, and what types of energy does New Zealand's domestic and international transport fleet use, and how is energy use changing, including modally, temporally, regionally and nationally?	🟡
EQ 1.4	Who owns the vehicle fleet, what is the value of capital stock invested in it, and how are these things changing, including modally and temporally?	🟡
EQ 1.5	Where, how and in what quantity are New Zealand's vehicles sourced and disposed of, how often are they changing hands, and how are these things changing, including modally, temporally and geographically?	🟡
EQ 1.6	What are the maintenance requirements of the vehicle fleet, how well are these being met, and how are these things changing, including modally, temporally, regionally and nationally?	🟡
Topic 2: People and Society		
EQ 2.1	How, when and in what numbers do people[36] travel to, from and within New Zealand, for what purposes, what are the origins and destinations of their journeys, and how are these things changing, including modally, temporally and spatially?	🟡
EQ 2.2	Who uses transport, how accessible is transport, who experiences barriers to access or use, what are those barriers, and how are these things changing, including modally, temporally, demographically and spatially?	🟠
EQ 2.3	What attitudes, perceptions and preferences do people have toward different modes of transport, what are the reasons for these attitudes, perceptions and preferences, what is the impact on travel patterns, and how are these things changing, including modally, temporally, spatially and demographically?	🟠
EQ 2.4	What is the relationship between Māori and transport, what impact does transport have on Māori traditions, aspirations and well-being, and how are these things changing over time?	🟠
Topic 3: Freight		
EQ 3.1	What is the volume and value of freight moving to, from and around New Zealand, what are the origins and destinations of this freight, and how are these things changing over time?	🟡
EQ 3.2	What freight is moving to, from and around New Zealand, how is it comprised, how are different industries affecting the volume and value of freight, and how are these things changing, including regionally and temporally?	🟠
EQ 3.3	How and when does freight move to, from and around New Zealand, by what routes, and how are these things changing, including modally, regionally and temporally?	🟠
EQ 3.4	What barriers exist to efficiently transporting freight to, from and around New Zealand, and how are these things changing, including regionally, temporally and modally?	🟡
Topic 4: Infrastructure and Investment		
EQ 4.1	How extensive is New Zealand's transport infrastructure, how is it comprised, what is its capacity, condition and geospatial location, and how are these things changing, including modally, temporally, nationally and regionally?	🟢
EQ 4.2	What is the value of capital stock invested in New Zealand's transport infrastructure, what is the return on this investment, and how are these things changing, including modally, regionally and temporally?	🟡
EQ 4.3	What and how do different groups[37] invest in transport infrastructure, by what mechanisms, how affordable and sustainable are these investments, what benefits do different groups receive from this investment, and how are these things changing, including modally, regionally and temporally?	🟠
EQ 4.4	What are the planned and actual costs of building and maintaining New Zealand's transport infrastructure, and how are these changing, including modally, regionally and temporally? How to safeguard transport infrastructure from the impacts of climate change?	🟡
Topic 5: Transport Integration and Network Resilience		
EQ 5.1	How is land being used, how does land use[38] affect the transport network, and how are these things changing, including modally, regionally and temporally?	🟡
EQ 5.2	How well connected are different parts of the transport network, how directly and seamlessly can people and freight get where they need to go, and how are these things changing, including modally, regionally and temporally?	🟠
EQ 5.3	What are the different types and levels of network congestion, where and when do they occur, what are the causes and effects, and how are these things changing, including modally, regionally and temporally?	🟠

35 Size of knowledge gap as identified in the Transport Domain Plan 2016. Reviewing the size of the knowledge gap was not in the scope of the refresh project and will be included in the future review of the Transport Evidence Base Strategy in 2020.
36 The use of the word 'people' refers to people in general and in specific groups (including Māori as tangata whenua)
37 These include iwi corporations
38 Where 'land use' refers to use of the land for conservation (e.g. national and forestry parks), forestry (e.g. for timber resources/wood supply), urban (e.g. built up areas and open parkland), and agriculture and horticulture.

EQ 5.4	What and where are the strategic corridors, gateways, hubs and supply chains to, from and within New Zealand, what is their capacity and contribution to moving people and freight, and how are these things changing, including modally, regionally and temporally?	
EQ 5.5	How effectively do the different transport system planning, governance and investment mechanisms interface, how cohesive are the decision-making processes and how does this impact on network integration?	
EQ 5.6	How well prepared is the transport network to respond to changing patterns of demand, and to endure shocks and crises?	
Topic 6: Transport Funding and Revenue		
EQ 6.1	What are the costs of providing, maintaining and operating New Zealand's transport system, by whom and in what proportions are these costs borne, and how are these things changing, including modally, regionally and temporally?	
EQ 6.2	What are the costs of using New Zealand's transport system, where, when, how and in what proportions are these costs borne, and how are these things changing, including modally, regionally and temporally?	
EQ 6.3	How much revenue does New Zealand's transport system generate, what are its sources, flows and destinations, how and for what purposes is it used, and how are these things changing, including modally, regionally and temporally?	
EQ 6.4	How sustainable are current funding and revenue-generating mechanisms and how well placed are these to meet future needs?	
Topic 7: Regulation		
EQ 7.1	What regulations apply to transport services operating in New Zealand, what are the costs and benefits of different regulations, how effective are different regulatory frameworks, and how are these things changing, including modally, regionally and temporally?	
EQ 7.2	To what extent are transport users and operators aware of rules and regulations, and how are these things changing, including modally, regionally and temporally?	
EQ 7.3	How often are rules and regulations breached by transport users and operators, what is the impact of breaches, and how are these things changing, including demographically, modally, regionally and temporally?	
Topic 8: Workforce[39]		
EQ 8.1	What are New Zealand's transport workforce requirements, how are these met by domestic and international sources of labour, in what roles and locations do workforce shortages exist, and how are these things changing, including demographically, modally, regionally and temporally?	
EQ 8.2	What are the demographic features of the domestic and international workforce, what skills are possessed by the workforce, and how are these things changing, including modally, regionally, temporally and across roles?	
EQ 8.3	What transport workforce planning is conducted, and how is New Zealand placed to address skills shortages and to train and up-skill its transport workforce, and how are these things changing, including modally, regionally, temporally and across roles?	
Topic 9: Economy		
EQ 9.1	What are the main sources, types and quantities of economic benefits from transport, how and where are these distributed, and how are these things changing, including modally, regionally and temporally?	
EQ 9.2	What are the sources, types and quantities of economic costs from transport, how and where are these borne, and how are these things changing, including modally, regionally and temporally?	
EQ 9.3	What transport services operate to, from and within New Zealand, how competitively are these services provided, and how are these things changing, including modally, regionally and temporally?	
EQ 9.4	What and where are the important international import and export markets for New Zealand, how effectively and efficiently can goods be transported to or from these markets, and how are these things changing, including modally, regionally and temporally?	
EQ 9.5	What is the relationship between the existence and location of the transport network and transport services, and economic activity in New Zealand?	
Topic 10: Safety and Health		
EQ 10.1	How safe are different forms of transport, what are the types and impacts of harm incidents, who experiences harms, and how are these things changing, including demographically, modally, regionally and temporally?	
EQ 10.2	What is the risk profile of different types of transport, what factors contribute to this risk and in what quantities and proportions, and how are these things changing, including modally, regionally and temporally and in response to interventions?	
EQ 10.3	What are the sources and types of health impacts from transport, what are the harms and benefits of these impacts, who experiences them, and how are these things changing, including modally, regionally and temporally?	
EQ 10.4	What international transport safety and security obligations does New Zealand have, how well are these met, and how are these things changing?	
Topic 11: Environment		
EQ 11.1	In what ways and to what extent does the transport system impact on the environment, how can this be improved, and how are these things changing, including spatially, modally and temporally?	
EQ 11.2	In what ways and to what extent does the environment impact on the transport system and how are these things changing, including spatially, modally and temporally?	
EQ 11.3	What are the implications of climate change impacts and greenhouse gas mitigation targets for the transport system, including spatially, modally and temporally? And what changes are needed for the transport system to effectively respond to climate change mitigation and adaptation related challenges?	

39 Inclusive of how agile/responsive the workforce is or should be to changes, including technology changes.

APPENDIX 4:

MAPPING ENDURING QUESTIONS AND TOPICS TO TRANSPORT OUTCOMES

Topics	Data and information needs	Transport Outcomes				
		Economic prosperity	Environmental sustainability	Healthy and safe people	Inclusive access	Resilience and security
T1 Transport fleet	The vehicle fleet plays a fundamental role in the transport system, moving people and freight where they need to go. This topic is about understanding the characteristics of the transport fleet and, hence, the capability and capacity of vehicles using the system.	✓	✓	✓	✓	
T2 People and society	Transport enables people to access health, education and social support services, and to participate in economic and recreational activities. This topic covers attitudes, perceptions and preferences of all transport users (including Māori as tangata whenua) as well as the underlying factors that influence transport users' decisions. Such information will inform investment planning and system management decisions.				✓	
T3 Freight	The transport system exists to move freight as well as people. Efficient movement of freight is essential to ensure that the transport system contributes to economic prosperity. This topic is about understanding the volume and value of freight, how it is moved and whether it is moved efficiently.	✓	✓			✓
T4 Infrastructure and investment	Transport infrastructure is critical to the operation of the transport system. This topic is about understanding the value of capital stock, nature and extent of New Zealand's transport infrastructure across all modes, what the return on this investment is, and how to safeguard transport infrastructure from the impacts of climate change. Such information will assist policy and planning to support optimum ongoing investment in transport.	✓	✓	✓	✓	✓
T5 Transport integration and network resilience	An integrated and resilient network is a critical factor in allowing the various elements of transport to combine and operate as a "system". This topic is about understanding how land use affects the transport network across all modes. This knowledge helps to identify the interaction with land use in enabling development and use of the transport system, and adapting to emerging threats.				✓	✓
T6 Funding and revenue	Building infrastructure is a large source of the cost associated with transport across all modes. The transport system also generates significant revenue, particularly for the Crown, but also for other groups. This topic covers the cost of transport provision and use, as well as funding and revenue.	✓				
T7 Regulation	Transport has the potential to create harms as well as benefits. Regulatory frameworks can minimise risky types of vehicles, behaviour and operations. This topic covers what regulations apply and how effective they are across modes.	✓	✓	✓	✓	✓
T8 Workforce	The range of transport-related occupations is vast. To operate the transport system effectively requires a workforce with sufficient capability and capacity to build, maintain, provide and operate the infrastructure and services. This topic covers the nature and extent of the transport workforce across modes.	✓		✓		
T9 Economy	Transport contributes directly and indirectly to the economic prosperity of New Zealand from people's ability to travel for employment or business opportunities. This topic covers the relationships between the transport networks, services and economic activities and the role that location plays in the provision of economic transport networks.	✓				
T10 Safety and health	The transport system can result in harm to people and their health. This topic covers the risk profiles across transport modes and the factors that contribute to these risk profiles. Such information helps to understand how these risks lead to transport-related harms, their causes and the mitigation opportunities.			✓		
T11 Environment	The relationship between transport and the environment is critically important. This topic is about understanding the types of impacts that come from the transport system. This information is critical to understanding not only how transport and the environment interact, but also the mix of policy responses required to address climate change related impacts and maintain or improve biodiversity, water quality and air quality		✓			

APPENDIX 5:

SUMMARY OF THE DOMAIN PLAN PRIORITY INITIATIVES

Overarching initiatives	
Improve access, reuse and sharing of data and information through the open release of government data	
Adopt common transport data standards, practices and inventories to improve collection, management, interoperability and sharing of data	
Incorporate priority data and information initiatives in government transport agency future work programmes	
Advance cross-government and public-private data-sharing partnerships	
Develop a coordinated approach to building data capability across the transport sector agencies	

Economic prosperity		
R3.2	Develop approach and set of indicators for monitoring freight efficiency	
R3.9 E	Repeat and enhance the National Freight Demand Study (R3.9); this includes: ‣ Improve access to domestic airfreight data (R3.10) ‣ Establish data partnership with Cook Strait freight and rail operators (R3.12 and R1.12) ‣ Collect baseline data on unrecorded light and urban freight (R3.5 and R3.7)	
R6.2 E	Improve information on the cost of providing, operating and maintaining the transport network (R6.2) this includes: ‣ Improve access to data on the rail network (R6.8) ‣ Develop infrastructure benchmarking tools (R4.4)	
R4.1 E	Research into returns on investment including both monetary (R4.1) and non-monetary (R4.18) returns	
R4.14	Integrate RAMM data and improve access	
R9.2 E	Improve economic modelling by developing: ‣ modelling oversight (R9.2) ‣ a set of key baseline assumptions (R4.2)	

Inclusive access		
R2.4	Establish baseline information on accessibility	
R2.8 E	Survey user behaviour and preferences: ‣ Collect information on user attitudes and preferences (R2.8) ‣ Research into why people don't (or can't) travel (R2.7)	
R2.14	Improve information and understanding of Māori needs from, use of, and involvement in transport	
R5.2	Integrate transport system and land use data for improved land use planning	
R2.6	Improve access to public transport patronage data	
R3.6 E	Develop geospatial capability to track freight and people movements: ‣ Establish data partnership with freight operators (R3.6) ‣ Establish partnerships with data providers to collect data on people movements (R1.14)	
R2.1	Improve access to Household Travel Survey data	

Environmental sustainability		
R11.1	Research into transport emission profiles	
R11.2	Develop environmental impact framework for maintaining or improving biodiversity, water quality and air quality	
R1.1 E	Publish vehicle fleet profile (also see R1.4, R1.8, R1.9, R1.10, R1.11)	
R11.9	Improve environmental impact evaluation around road run-off	
Healthy and safe people		
R10.1	Develop health and safety system risk profiles (and exposure)	
R10.3	Review methods for updating the Value of Statistical Life (VSoL)	
R2.13	Collect data on active travel (walking & cycling)	
R10.6	Align injury classification definitions across datasets	
Resilience and security		
R5.1	Develop sector definition of resilience	
R4.19	Improve information on local roads capacity and utilisation	
R11.10	Impacts of weather- and environment-related network outages	

Key	
E	Cluster of initiatives as an extension of a specific individual initiative
	Improve access
	Improve governance
	Invest in the right activities
	Facilitate collaboration
	Develop capacity and capability

APPENDIX 6:

SUMMARY OF RESEARCH STRATEGY PRIORITY TOPICS

Overarching initiatives	
Adopt National Research Information System (NRIS) for recording information about all publicly funded transport-related research	
Implement Transport Knowledge Hub Decision Board to improve coordination of research initiatives	
Establish process to prioritise and commission research initiatives	
Develop a coordinated transport research community inclusive of researchers, funders and government agencies	
Promote participation in international research programmes and provide support for post-graduate transport researchers	

Research-related knowledge gaps and priorities
Transport's contribution to wellbeing and liveability
The impact of new technology and innovations

Economic prosperity	
EQ9.5, EQ5.2, EQ5.3	Relationship between transport and the economy
EQ9.1, EQ9.2	Transport-related economic costs and benefits
EQ4.2, EQ9.2, EQ4.3	Return on transport investment

Inclusive access	
EQ2.2, EQ2.3	Reasons for travel and transport and non-travel choices
EQ5.1, EQ5.2	Relationship between transport and land-use planning
EQ2.4	Improve understanding of Māori views and needs

Environmental sustainability	
EQ11.1	Measurement of environmental emissions
EQ11.1	Measurement of environmental impacts
EQ11.1	Reduce transport-related environmental impacts

Healthy and safe people	
EQ2.3	People's attitudes and perceptions on travel
EQ10.2	Relationships between transport and harms
EQ10.3	Relationship between transport and health

Resilience and security	
EQ5.6	Interdependencies between transport and other infrastructure networks
EQ5.6, EQ11.2	Resilience to environmental changes
EQ5.6	Measurement of direct and indirect costs and benefits

Key	
EQ	Enduring question
	Improve access
	Improve governance
	Invest in the right activities
	Facilitate collaboration
	Develop capacity and capability

APPENDIX 7:

GLOSSARY

Data and information

This term refers to structured, unstructured, raw and processed data, statistics, analytics and information.

Enablers

The enablers describe a set of actions required to support generation and use of the transport evidence base. These include:

- Improve access – ensure data, research and evaluation findings are discoverable, accessible and reusable.
- Improve governance – ensure sharing, integration, and governance of key data and information products
- Invest in the right activities – ensure we invest in the right activities and projects
- Facilitate collaboration – foster cross-agency collaboration and relationships with the wider transport sector
- Develop capacity and capability – ensure the sector has access to the right skills and knowledge.

Enduring questions

Enduring questions are the big picture strategic-level questions Government will need to answer to make evidence-based strategy, policy, operational and administrative decisions about transport into the future. They are important because, if we cannot answer them with high-quality information, it limits our ability to achieve the desired transport outcomes.

Evaluation

Systematic collection of information about the activities, characteristics, and outcomes of a specific project (e.g. a policy, a programme) to make judgements about the project, improve its effectiveness and efficiency, and/or inform decisions about future development.

Evidence base

Available data, information, statistics, analytics, research, evaluation, and models to enable decision-making.

Research

A range of activities that aim to fill knowledge gaps. These activities include data collection and basic research, experimental or theoretical research, applied or "blue skies" research.

The following are examples of activities that are not normally classed as research:

- Routine testing and analysis of materials
- Components and processes, (e.g. for the maintenance of national standards, as distinct from the development of new analytical techniques)
- Feasibility studies (where it is not an integral part of an overall research project)
- Routine software development
- General purpose data collection
- "Designing a new product is not a research output but writing up the innovative process used and submitting the paper for publication and review would be. Providing a policy submission to a Select Committee is not a research output, but a publication that reflects on the process of policy debate or theories from it would be"[40].

Transport Knowledge Hub

A means by which members of the transport research community connect and coordinate with others with similar interests to broaden research, evidence, analysis and modelling knowledge, and sector capacity and capability.

Transport Outcomes Framework

Set of inter-related outcomes that need to be met as a whole to improve intergenerational wellbeing and quality of life across New Zealand's cities, towns and provinces. These include inclusive access, healthy and safe people, environmental sustainability, resilience and security, and economic prosperity.

Transport sector

All those agencies and entities that are involved in the business of moving people and goods within New Zealand as well as to and from New Zealand. Transport covers all modes: maritime, land and air transport.

Transport system

The transport system includes the:

- Vehicles that move people and products, physical infrastructure (e.g. ports, roads, car parks)
- Digital infrastructure (e.g. satellite-based navigation aids, travel apps, communications technologies);
- Mobility services (e.g. public transport, bike-sharing, ride-sharing); and
- The institutions and regulatory systems that influence how the transport system functions and develops (e.g. through their structures, management practices, rules, policies, and funding/investment tools)[41].

40 Frascati Manual OECD
41 From the Transport Outcomes Framework June 2018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