

# NEW ZEALAND TRANSPORT DOMAIN PLAN

Developing a shared understanding of  
transport data and information priorities

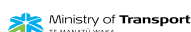
July 2016



# ORGANISATIONAL ENDORSEMENT

The New Zealand transport sector is large and diverse. It employs people whose work can involve anything from building roads, operating trains, and flying planes, to negotiating land use and resource management. Keeping people safe and secure and ensuring that the transport networks are aligned with the location of hospitals, schools, work and leisure venues are vital to the well-being of every New Zealander.

The diverse nature of the transport sector makes it challenging to develop a shared vision and priorities for meeting the statistical and information needs for transport.



The **Ministry of Transport** and **Statistics New Zealand** share responsibility for ensuring that sufficient and high-quality information and data is available to inform policy decisions within the transport sector, and more broadly. These two agencies also provide information to other audiences including the public, media, businesses and interest groups. This Domain Plan is the result of significant collaboration and engagement among the following key transport sector organisations, each of which endorses this Domain Plan.



The **New Zealand Transport Agency (NZTA)** holds large volumes of transport data on the land transport system. It manages the motor vehicle and driver licence registries. It also consolidates information from local government on the performance of the local land transport systems. NZTA endorses this Domain Plan and supports the next phase of work to develop the implementation plan. It will work with information managers across the transport agencies to help ensure the work on information management and information architecture aligns with that of the Domain Plan.



The **Civil Aviation Authority (CAA)** holds information on the safety performance of the aviation system and the organisations and individuals certified to participate within the system. The aviation system is a closed system with strong entry controls on participants, which leads to relatively detailed data about the system. The closed system stems from the historically high cost, complexity and safety requirements of aviation. Recent developments such as satellite navigation, remotely piloted aircraft and electric propulsion are challenging that paradigm and also the type of information we hold and need to hold. Accordingly, the CAA welcomes the endeavours of the Ministry of Transport and Statistics New Zealand to collect and share information and will participate as far as possible while remaining cognizant of the Civil Aviation Act and its associated international obligations.



**Maritime New Zealand (MNZ)** is the national regulatory, compliance and response agency for the safety, security and environmental protection of coastal and inland waterways. It holds information to enable it to fulfil its regulatory, compliance and response functions. In particular, MNZ has information related to licensing and certifying seafarers and commercial maritime operations, maritime harm events, rescue co-ordination services and security threats to New Zealand's maritime interests. MNZ endorses this Domain Plan process and supports the development of an implementation plan.



The **Ministry of Business, Innovation and Employment's (MBIE)** purpose is to grow the New Zealand economy to provide a better standard of living for all New Zealanders. This Domain Plan will complement existing domain plans including the Energy Domain Plan, which covers energy for transport and urban development. Improved transport-related information will assist the research sector in the production of excellent science and innovation that has a positive impact on our economy, society and environment. It will also be useful for development and delivery of policy, services, advice and regulation that support people, businesses, communities and regions to be successful.



**Local Government New Zealand (LGNZ)** is the sector voice for all 78 councils in the country, and advocates on behalf of members who are mayors, chairs, chief executives and councillors at councils, and local and community boards. LGNZ leads the sector's commitment to improving practice and efficiency, and enabling economic growth, community vibrancy and environmental well-being. This Domain Plan represents the effort of numerous stakeholders, including local and regional government, to improve the way transport information is collected, shared and used. Recognising that pertinent and current transport information can be difficult to find, LGNZ supports this Domain Plan as an effort to identify and provide statistics and information to effectively and efficiently maximise social and economic benefits of the transport system.

## Related documents



1.



2.



3.

Read this Transport Domain Plan in conjunction with:

1. **New Zealand Transport Research Strategy**  
Online PDF at: [www.transport.govt.nz/transport-research-strategy.pdf](http://www.transport.govt.nz/transport-research-strategy.pdf)
2. **Full List of Recommendations**  
Online PDF at: [www.transport.govt.nz/full-list-recommendations.pdf](http://www.transport.govt.nz/full-list-recommendations.pdf)
3. **New Zealand Transport Information Strategy and Architecture**  
\* Under development, to be published in 2017/18

# MINISTER'S FOREWORD

**Transport is an integral part of our lives. It gets us where we need to go, connects our communities and enables our economic growth. Each year, central and local government invest over \$5 billion to develop, operate and maintain our transport system. This investment relies on high-quality information.**

There is already a wealth of information available about our transport system but it is not well connected. The first edition of this Transport Domain Plan identifies the gaps and opportunities for increasing the value of the information we already hold as well as our overall knowledge of the sector. This will help ensure we have the information needed to build the best transport system possible.

This Domain Plan represents the collective effort of the transport agencies and other central, local and regional government bodies, to improve the way transport information is collected, shared and used. This is particularly important given the increasing amount of data and information that can be captured using new and emerging technologies.

The transport information domain is vast. I congratulate those who have invested their time and effort in helping develop this Domain Plan. Once it is implemented, key data, statistics and information will be easier for us all to find, share and use. It will also lead to greater integration of information systems to ensure better use of existing data and development of new data.

The production of this Domain Plan is only the beginning. Developing and maintaining a Domain Plan for transport is a long-term project. There are many exciting opportunities before us and we need to make the most of them to deliver a transport system that helps enable New Zealand to continue to thrive.



**Hon Craig Foss**

Associate Minister of Transport  
Minister of Statistics



# CHIEF EXECUTIVES' INTRODUCTION

**Everyone uses the transport system in some way, whether it is to get to work, meet family and friends, transport goods or connect with the rest of the world. The transport industry alone contributes around 5% of New Zealand's GDP and employs around 80,000 people.**

Making the best possible investment decisions requires high-quality data and information. To deliver a transport system that meets users' needs, it is necessary to understand their preferences and behaviour.

The *New Zealand Transport Domain Plan* is the result of an intense collaborative effort across the transport sector. Over the past two years the project team has carried out a series of interviews, meetings and workshops to discuss big policy questions, and to identify information and data needs.

To support well informed decision-making, we must improve the way we collect, share, publish and use transport data. Work done to develop this Domain Plan provides a practical example of how proactive collaboration between government agencies can harness the collective skills, knowledge and expertise required to deliver better public services to New Zealanders.

This collaborative approach will enable us to implement this Domain Plan and achieve the results we seek. By co-ordinating our efforts we can use the power of data to deliver a transport system that helps New Zealand thrive.



A handwritten signature in black ink, appearing to read 'P. Mersi'.

**Peter Mersi**  
Secretary for Transport  
Chief Executive  
Ministry of Transport

A handwritten signature in black ink, appearing to read 'Liz MacPherson'.

**Liz MacPherson**  
Government Statistician  
Chief Executive  
Statistics New Zealand

# THE DOMAIN PLAN AT A GLANCE

## Goal

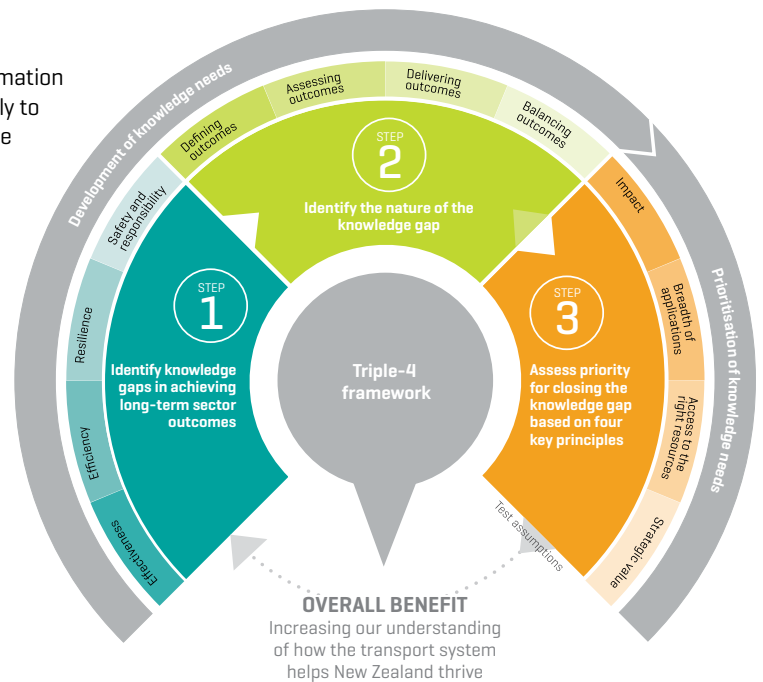
To ensure the right transport statistics and information are collected and shared efficiently and effectively to maximise the economic and social benefits of the transport system and to minimise harm

## Purpose

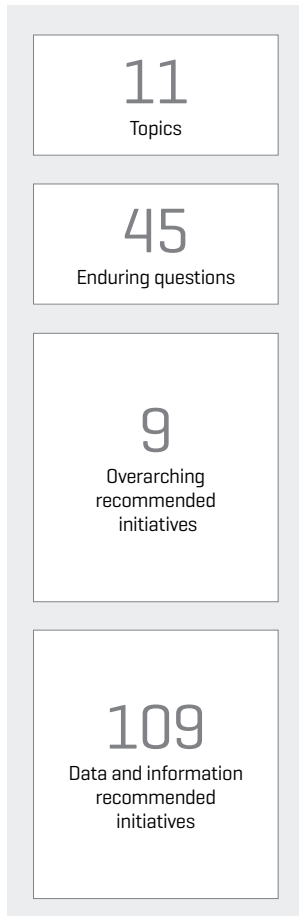
Develop a shared understanding of transport data and information priorities

## Tool

Triple-4 knowledge development and prioritisation framework (right)



## WHERE WE STARTED...



## WHERE WE ENDED UP...



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## CONTEXT

**WE WANT TO HAVE HIGH-QUALITY TRANSPORT RESEARCH DATA, STATISTICS AND INFORMATION TO HELP DELIVER ON THE GOVERNMENT'S GOAL OF GROWING THE ECONOMY.**

# THE FULL PICTURE

## There is demand for improvements in public services to address complex, long-term issues that affect New Zealanders.

The Government's overall goal is to grow the economy to deliver greater prosperity, security and opportunities for all New Zealanders. To do this it needs high-quality research, data, statistics and information on which to base its decisions.

The transport system plays a fundamental role in achieving the Government's overall goal. It allows us to connect with each other for economic, social and recreational reasons and enables us to trade with one another and the rest of the world.

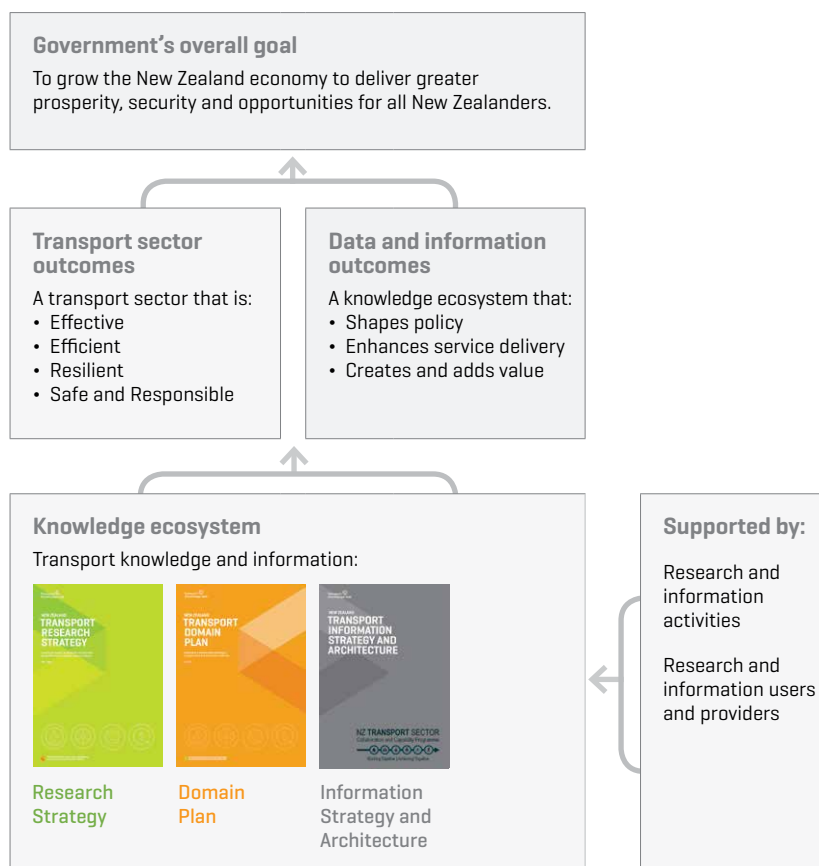
Research and information play a key role in shaping the policy landscape. Good evidence-based policy decisions also help New Zealand to enhance the delivery of services provided by both the public and private sectors. These services will, in turn, create and add economic value to New Zealand [Figure 1].

This **Domain Plan** is supported by the New Zealand Research Strategy and the New Zealand Transport Information Strategy and Architecture.

The **Research Strategy** focuses on the four key enablers needed to ensure we invest in the right knowledge, collaborate across the wider research community, ensure research inputs and results are visible, and help people to access and invest in transport sector knowledge and capability.

The **Information Strategy and Architecture** complements and updates the stocktake of transport data, information and statistics that has been carried out as part of the Domain Plan process. It provides the structure that is required to develop systems and standards stewardship to support data integration and sharing, enable the transport sector to work together to learn from each other to improve how information is managed and shared, and help to improve how transport statistical and information services are provided to users.

FIGURE 1: MEETING TRANSPORT KNOWLEDGE NEEDS IN OUR STRATEGIC ENVIRONMENT



This Domain Plan is aligned with the:

- ▶ Government's Information and Communications Technology [ICT] Strategy and Action Plan
- ▶ New Zealand Data Futures Forum Principles and Recommendations
- ▶ New Zealand Government Open Access and Licensing [NZGOAL]
- ▶ National Statement of Science Investment
- ▶ New Zealand Business Growth Agenda
- ▶ Thirty-Year New Zealand Infrastructure Plan
- ▶ Intelligent Transport Action Plan
- ▶ Safer Journeys Strategy 2010 – 2020



### The value of the transport system for New Zealand

Transport is a critical part of daily life for all New Zealanders. At its most basic level, transport is about moving people and goods from point A to point B. At its most effective level, transport can be an enabler, driving growth, trade and employment.

The transport sector employs over 83,000 people and the transport and storage industry accounts for around 5% of New Zealand's GDP. The country's transport assets – roads, railways, ports and airports – are worth more than \$80 billion. Our transport network is essential to helping grow New Zealand's economic potential.

The New Zealand transport system is complex. Many different but dependent parts make up the system, and each makes an important contribution to the overall way people and freight are moved. We need good-quality information about how this system works if we are to make good decisions about how we manage it, now and in the future.

An effective transport system is one that moves people and goods in a reliable, timely, safe and sustainable manner. This requires co-ordination between people, vehicles and infrastructure. Such coordination stems from a combination of market forces, individual decisions, rules, regulations and a whole host of other incentives and signals. Transport policy settings, therefore, play a crucial role in delivering good transport outcomes for New Zealanders.

In addition to managing our existing transport network well, we need to plan for the future. Technology will continue to change the way the transport system operates, requiring us to think about how we regulate and invest in intelligent transport systems. Our population will continue to grow, leading to more people and freight being moved around New Zealand and internationally.



### 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 New Zealanders and deliver economic growth. Data can be used to solve complex problems, generate innovative ideas, and unlock public and private value. Data can provide new insights that can inform policy decisions and shape the design and delivery of government services. Access to government-held information will also enable others across society to generate fresh insights and pursue new opportunities that will advance economic growth.

The *Government Information and Communication Technology [ICT] Strategy 2015* identifies information as one of its key focus areas. The ICT Strategy identifies the importance of information skills to drive new insights and better decisions, open data and sharing by default. These need to be supported by privacy and security settings. Public trust and confidence are important for sharing and re-using data and information. These in turn require the support of frameworks and infrastructure to facilitate flows of information. The ICT Strategy seeks to realise the benefits from emerging opportunities including the availability of new technology and partnerships with the private sector.

A number of cross-government initiatives are underway to harness these opportunities. Government 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.

## GOAL AND PURPOSE

**OUR GOAL IS TO ENSURE  
THE RIGHT TRANSPORT  
STATISTICS AND INFORMATION  
ARE COLLECTED AND  
SHARED EFFICIENTLY AND  
EFFECTIVELY TO MAXIMISE  
THE ECONOMIC AND  
SOCIAL BENEFITS OF THE  
TRANSPORT SYSTEM AND  
TO MINIMISE HARM.**





# PURPOSE OF THIS DOCUMENT

**Data, information, statistics and knowledge about the transport sector and how it works are collected and managed across multiple agencies and organisations.**

This Domain Plan has been developed to identify what data is important to achieve better transport outcomes for New Zealand. It will help the transport sector to better co-ordinate how agencies collect and manage data and knowledge, and ensure that existing information is visible, easy to use and maximises the value of data by enabling greater data sharing and integration.

It also provides a tool for targeting research and investment across the transport sector, and creates a common approach for how sector agencies prioritise transport data and research.

This 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 including identifying common knowledge themes and activity streams
- ▶ categorises the initiatives into high and medium priorities for the sector to pursue over the short to medium term
- ▶ combines the high-priority initiatives into clusters to eliminate overlaps and summarises them by knowledge theme.

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.

“...to make the evidence-based transport decisions that will lead to better outcomes for New Zealanders”



## APPROACH

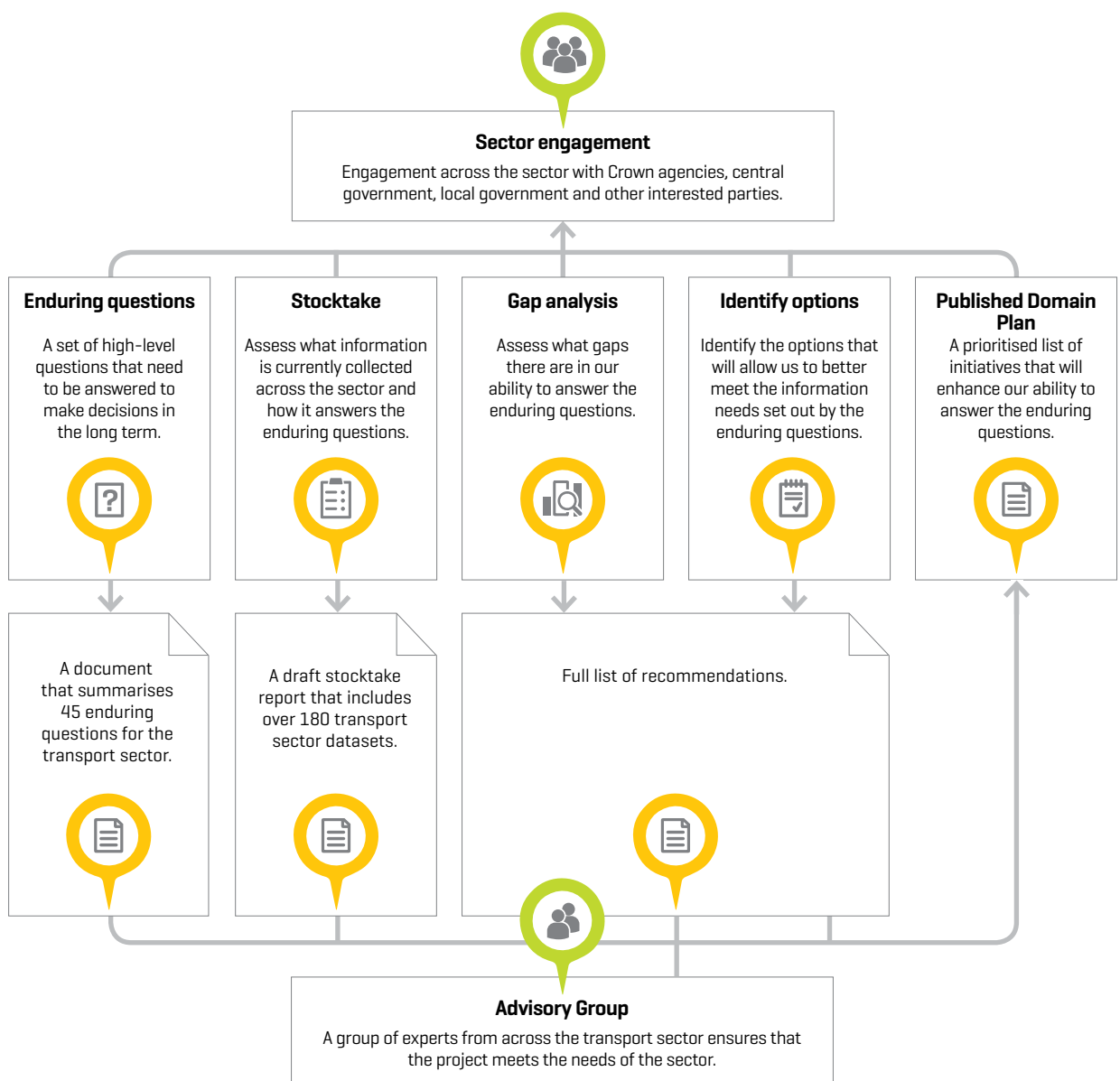
**TO DEVELOP A BASELINE PICTURE OF THE DATA, INFORMATION AND STATISTICS NEEDS OF THE TRANSPORT SECTOR, A SERIES OF WORKSHOPS WAS HELD TO IDENTIFY THE FUNDAMENTAL AND LONG-TERM QUESTIONS FACING THE SECTOR.**

**These workshops included people from across the transport sector and the wider public sector. Through these workshops, and other consultation with key transport sector stakeholders, we identified the important areas of transport policy interest.**

From these, we developed the enduring questions and associated recommended initiatives that form the basis of this Domain Plan.

Figure 2 shows the domain planning process and the resulting publications. There are three other publications in addition to this Domain Plan – one listing the enduring questions, a draft stocktake report, and one outlining the recommended initiatives. These documents are available online from the Ministry of Transport’s website at: [www.transport.govt.nz/research](http://www.transport.govt.nz/research)

FIGURE 2: THE DOMAIN PLANNING PROCESS AND RELATED PUBLICATIONS



## Step 1: Enduring questions

Enduring questions that we have developed with stakeholders are the big-picture strategic level questions that 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 that ‘we know we will need to know’ into the future to inform high-quality operational, administrative, investment and policy decisions.

## Step 2: Stocktake

We documented the datasets currently held by public sector agencies. Together with the enduring questions, this stocktake process provided an opportunity for subject matter experts and key stakeholders to identify what the key knowledge gaps are and how to address them.

The stocktake remains in ‘draft’ format to acknowledge that the data and information environment is changing so fast that any publication would quickly become outdated. For a published stocktake to generate value, it must be searchable and modifiable by data custodians. It would also be useful if the stocktake could be improved to cater for information management needs. Information managers are best placed to complete, update and improve the content where appropriate, and build on the work of the draft stocktake.



### Step 3: Gap analysis

Following the stocktake, a gap analysis was completed to find out how well the available data, statistics and information could assist with meeting each component of the enduring questions. A gap analysis tool was developed for subject matter experts to score the degree to which current knowledge and information is able to provide answers for the enduring questions. The tool helps to determine the relative size of the knowledge gaps.

Based on the ability to answer the enduring questions with current data, the knowledge gaps were assessed as large for 15 of the enduring questions. Only four of the enduring questions were assessed as having small knowledge gaps. The remaining 26 enduring questions were assessed as having medium knowledge gaps.

### Step 4: Identify options

Before identifying options for the sector to take forward, subject matter experts confirmed the extent of the knowledge gaps and the possible actions to address those gaps.

This exercise resulted in 118 recommended initiatives, including both overarching and topic or knowledge theme-related recommendations. These were originally documented in the draft Domain Plan<sup>1</sup> released for stakeholder engagement in late 2015. The Triple-4 framework has been developed and used to help prioritise the long list of recommended initiatives, considering important aspects around urgency, cost-effectiveness and potential benefits from implementation.

We analysed advice received from subject matter experts and key stakeholders to help identify high- to medium-priority initiatives. We provided a summary of the findings to the stakeholders for discussion at a sector workshop, which took place in March 2016. This Domain Plan documents the outcomes resulting from these engagement activities.

One of the key messages from the domain planning process was that: *“We know a lot, we have brought it all together, we now need to start using it.”*<sup>2</sup> We kept the important principle of ‘remember your users – better transport outcomes occur when people understand and use the data’ front of mind during development of the Domain Plan.

As a result, in addition to filling important data gaps, a large proportion of the initiatives proposed represent opportunities for the sector to work together to enhance how we use existing or emerging datasets (including data generated from digital technologies).

<sup>1</sup> A full list of the initial recommendations is available for download on the Ministry of Transport’s website.  
<sup>2</sup> Comment from a participant at one of the stakeholder engagement workshops to finalise the Domain Plan.

## Step 5: Summarise the topics into four knowledge themes

**This Domain Plan is built on the work initially developed for 11 important topic areas of transport policy interest that comprise the transport system. They are: Transport fleet; People and society; Freight; Infrastructure and investment; Transport integration and network resilience; Funding and revenue; Regulation; Workforce; Economy; Safety and health; and Environment. These form the basis for developing the enduring questions and the associated recommended initiatives.**

There are multiple ways to summarise the topics, enduring questions and the associated recommendations. These need to be meaningful to a wide range of end users. To better align the key long-term strategic issues that are well understood

by the sector, this Domain Plan adopted the following four *knowledge themes* detailed in the Research Strategy.

The data and information needs for these topic areas are briefly discussed in Figure 4. Mapping of enduring questions and recommended initiatives is provided in Appendix 3.

There are overlaps between categories. For example, to answer some of the enduring questions under the “economy” topic requires answers to the enduring questions for the “freight” topic. Equally, to answer the enduring questions under the “Transport impacts” knowledge theme may require answers to the enduring questions under the “User behaviour and needs” knowledge theme. Having only four knowledge themes simplifies how the Domain Plan information is communicated. Information on the 11 topic areas will continue to be available for reference purposes.

FIGURE 3: KNOWLEDGE THEMES

| Knowledge themes                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                  |                                                                                                                                                                                 |                                                                                                                                                                                                               |                                                                                                                      |
| <b>User behaviour and needs</b>                                                                                                                                                                                                    | <b>Transport impacts</b>                                                                                                                                                                                                                                          | <b>System planning and management</b>                                                                                                                                                                                                                                                            | <b>Future funding and charging</b>                                                                                                                                                                       |
| Better understanding the transport choices and preferences of users, communities and society and how to manage uncertainties (such as those arising from technological advances) around changing preferences, behaviour and needs. | Better understanding the size, exposure, valuation, interactions and influences of social, economic, cultural (including transport impacts for Māori <sup>3</sup> as tangata whenua) and environmental impacts as well as the potential effects from mitigations. | Better understanding of how users make transport decisions by mode, location and industry and how to measure monetary and non-monetary benefits and costs of transport as well as aligning with the cultural, spiritual, social, physical economic and political dimensions of Māori well-being. | Better understanding how transport cost burdens are distributed, how users respond to changes in cost and price, and what the impact on revenue and charging is of changing technologies and user needs. |

<sup>3</sup> Māori include individuals with a Māori cultural identity and ancestry (whakapapa) including Māori belonging to iwi/hapū/whānau, marae, Māori organisations, urban authorities, kaitiaki groups, Māori landowners, Māori businesses and Māori networks.

FIGURE 4: ORIGINAL DOMAIN PLAN TOPICS AND TRANSLATION INTO KNOWLEDGE THEMES

| Topics                                             | Data and information needs                                                                                                                                                                                                                                                                                                                                                                                                       | Knowledge themes                                                                                                |                                                                                                          |                                                                                                                       |                                                                                                                    |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                  | <br>User behaviour and needs | <br>Transport impacts | <br>System planning and management | <br>Future funding and charging |
| T1<br>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<br>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<br>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<br>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, and what the return on this investment is. Such information will assist policy and planning to support optimum ongoing investment in transport.                                                       |                                                                                                                 | ✓                                                                                                        | ✓                                                                                                                     |                                                                                                                    |
| T5<br>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.                                                              |                                                                                                                 |                                                                                                          | ✓                                                                                                                     |                                                                                                                    |
| T6<br>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<br>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<br>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<br>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<br>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<br>Environment                                 | The relationship between transport and the environment is critically important. This topic is about understanding the types of emissions that come from the operation of 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 related impacts.                                                      |                                                                                                                 | ✓                                                                                                        |                                                                                                                       |                                                                                                                    |

## Step 6: Apply the Triple-4 framework

**Our next step was to identify what the key data and knowledge needs were using the Triple-4 knowledge development and prioritisation framework (Figure 5). The Triple-4 framework has three components and is designed to be an iterative process.**

**Step 1** makes sure that knowledge gaps in sector outcomes can be identified. This requires assessing whether a data or research gap exists, and how addressing the gap can help to achieve understanding or deliver the four long-term sector outcomes.

**Step 2** makes sure that the nature of the research gap can be identified. This requires assessing the type of research gap that exists to make sure research efforts are appropriately spread across different types of research gaps. There may be current knowledge gaps in any or all of the following categories.

- ▶ **Defining outcomes** – identifies and defines the outcome to pursue
- ▶ **Assessing outcomes** – identifies how the outcomes might be best assessed
- ▶ **Delivering outcomes** – identifies the best interventions to secure improvements or close any gaps to the desired state
- ▶ **Balancing outcomes** – identifies the appropriate balance and trade-off between outcomes and efforts.

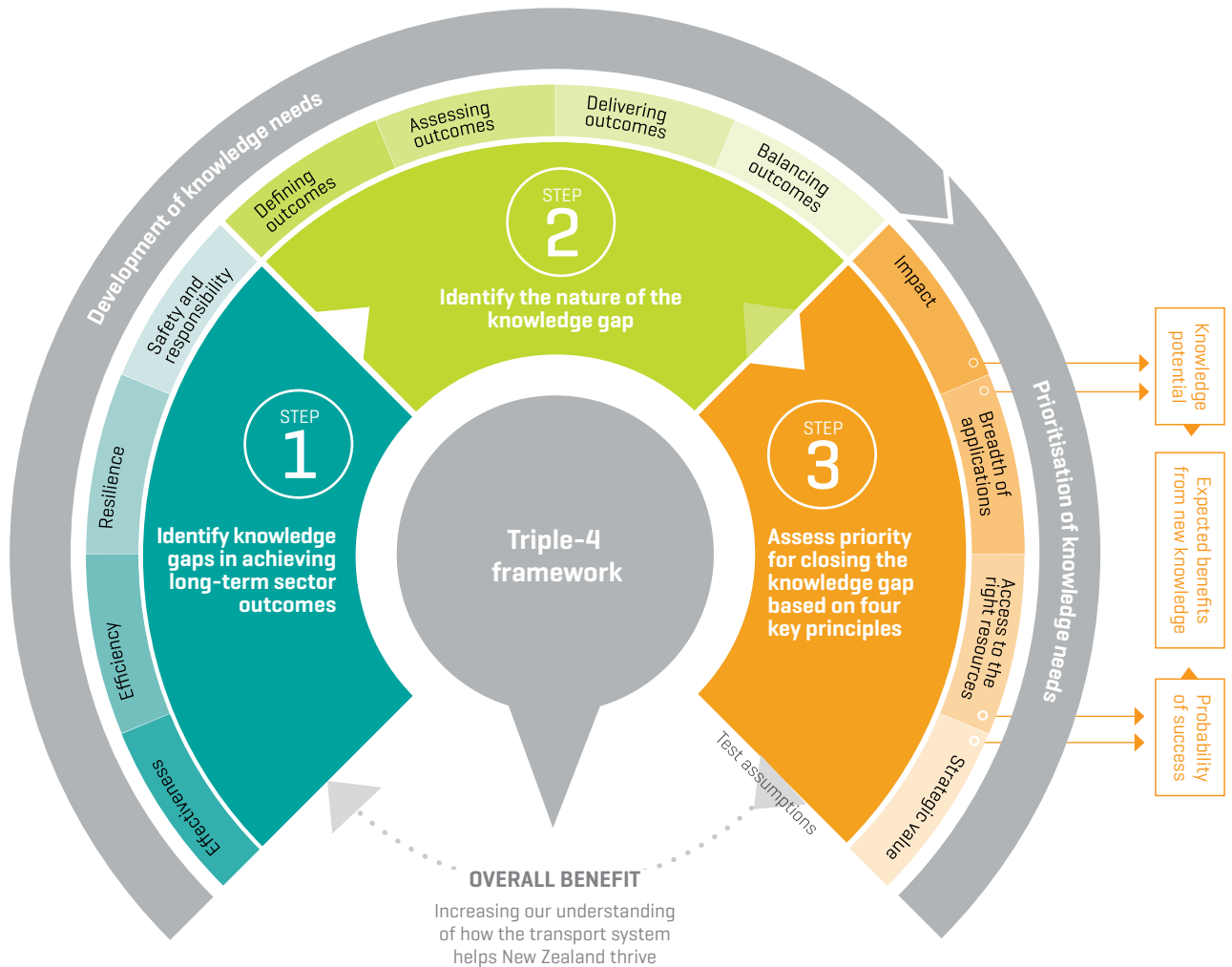
**Step 3** makes sure that closing the knowledge gaps will maximise the benefits from doing so. The framework applies the following four tests to assess the relative priorities.

- ▶ **Impact** – Can we identify existing and potential end use and end users? Do we know what the benefits will be and how big they are? Do we know how necessary the research is?
- ▶ **Breadth of applications** – Will the knowledge gained by the research be accessible across the sector? Can the knowledge be used flexibly and applied in different situations? Can the knowledge be transferred and used in a wide range of applications and across organisations? Can the research be leveraged off relevant domestic and international research?
- ▶ **Access to the right resources** – Are we able to access the skills, capability, techniques, tools and systems required? Is the required data reliable and available? Do we have the capacity to do the work and is it affordable?
- ▶ **Strategic value** – Can the knowledge gained by doing the research help to address the strategic issues faced by the sector? Is this the right time to do this research, considering the strategic issues?

The Triple-4 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.

This framework is flexible and can be adapted for selecting high-level knowledge themes, specific data or research topics, projects or programmes. We recommend that researchers and agencies use the Triple-4 framework as a reference to help develop and prioritise data or research projects and programmes during the corresponding selection process.

FIGURE 5: TRIPLE-4 KNOWLEDGE DEVELOPMENT AND PRIORITISATION FRAMEWORK FOR DELIVERING TRANSPORT SECTOR OUTCOMES



#### Definitions:

##### Effectiveness

Moves people and freight where they need to go in a timely manner

##### Efficiency

Delivers the right infrastructure and services to the right level at the best cost

##### Resilience

Meets future transport needs and endures shocks

##### Safety and responsibility

Reduces harm from transport

##### 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

# RECOMMENDED INITIATIVES

**Being able to answer a specific enduring question by the subject matter experts does not necessarily mean that no improvement can be made.**

The transport sector wants to improve how transport data, statistics and information is collected and shared, regardless of whether the enduring question can easily be answered.

Two of the enduring questions with small knowledge gaps have high-priority initiatives that aim to improve the quality of existing information and improve data access and publication, sharing and integration.

**Having large knowledge gaps does not always match with the scope of improvement as it varies with the nature of the knowledge gaps.**

Three out of 15 enduring questions with large knowledge gaps do not have any associated high-priority initiatives.

Two of the enduring questions have four associated medium-priority initiatives.

# **This Domain Plan identified nine overarching and 109 topic-related potential initiatives (see Appendix 2).**

These initiatives were at different levels of development and detail, as the extent of the knowledge gaps, the scope for and the type of improvements vary significantly between enduring questions.

For some enduring questions, the best course of action could be to improve the existing stock of knowledge by focusing on specific components of a dataset. In these situations, related recommended initiatives could be at a higher level of detail than other cases. In other cases where there is a lack of understanding of a complex subject, there will be a lack of sufficient detail to assist framing of what is needed. In those situations, related recommended initiatives could be at a concept level. Both of these types of recommendations are valid for the purposes of the Domain Plan. The Triple-4 framework was used to prioritise the long list of potential initiatives for implementation.

## **Overarching initiatives**

Through applying the Triple-4 framework, we identified four high-priority overarching initiatives as shown in Figure 6.

There were three separate initiatives related to the stocktake study, including one classified as a high-priority initiative, and all three stocktake-related initiatives have been clustered together to form an extended initiative (now referred as H1 E).

FIGURE 6: HIGH-PRIORITY OVERARCHING INITIATIVES

|                                            |      |                                                                                                                                                                        | Scale | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> | Criteria                |                 |                 |  |
|--------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|--|
| Initiatives                                |      |                                                                                                                                                                        |       | Impact                                                                                              | Breadth of applications | Strategic value | Right resources |  |
| Possible quick win                         | H7   | Review the Transport Indicator Framework                                                                                                                               |       | <div></div>                                                                                         | <div></div>             | <div></div>     | <div></div>     |  |
| Transport information architecture related | H5   | Improve transport sector information governance                                                                                                                        |       | <div></div>                                                                                         | <div></div>             | <div></div>     | <div></div>     |  |
|                                            | H1 E | Review the content of the 2015 Transport Domain Plan stocktake and investigate the best way to publish and update the information                                      |       | <div></div>                                                                                         | <div></div>             | <div></div>     | <div></div>     |  |
| Other high-priority initiative             | H9   | Enhance transport sector information systems to enable management of significant volumes of network level data that will be generated by intelligent transport systems |       | <div></div>                                                                                         | <div></div>             | <div></div>     | <div></div>     |  |

Note: The recommended initiatives contribute to "effective" and "efficient" transport outcomes by providing the evidence required for policy, investment and operational decisions. The knowledge gaps identified are mostly related to improving how we assess outcomes. An "E" denotes an extension of the original recommended initiative.

## Quick wins and high-priority initiatives

By applying the Triple-4 knowledge development and prioritisation framework, we have been able to identify 23 clusters of high-priority initiatives, including nine potential quick wins and 14 other high-priority initiatives. These are summarised in the next few pages.

FIGURE 7: THEME OVERVIEW – USER BEHAVIOUR AND NEEDS

|  <b>User behaviour and needs</b>                                                    |                           |                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Knowledge needs</b><br><b>Understanding the characteristics of the transport fleet and, hence, the capability and needs capacity of vehicles using the system</b> |                           |                                                                                                                                                                                                                                                                                                                 |
| Topic                                                                                                                                                                | Related enduring question |                                                                                                                                                                                                                                                                                                                 |
|  <b>Topic 2: People and society</b>                                                 | EQ 2.1                    | How, when and in what numbers do people 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?                                                                                                                             |
|  <b>Topic 3: Freight</b>                                                          | 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?                                                                                                                                       |
|  <b>Topic 7: Regulation</b>                                                       | 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?                                                                                                |
|  <b>Topic 9: Economy</b>                                                          | 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?                                                                                                                                                              |

|                                 |        |                                                                                                                                                   | Impact            | Breadth of applications | Strategic value | Right resources |
|---------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------|-----------------|-----------------|
| Scale                           |        | <div><div></div><div></div><div></div><div></div><div></div></div> <div>M</div> <div>H</div>                                                      |                   |                         |                 |                 |
| High-priority initiatives       |        |                                                                                                                                                   | Assessment result |                         |                 |                 |
| Quick wins                      | R2.1   | Improve awareness of and access to information from the <i>New Zealand Household Travel Survey</i>                                                | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R2.6   | Improve access to high-quality public transport patronage data                                                                                    | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R3.2   | Develop an agreed approach and set of indicators for monitoring freight efficiency                                                                | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
| Other high-priority initiatives | R2.8 E | Gather additional information on people’s attitudes, preferences and perceptions about transport [this combines with recommended initiative R2.7] | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R2.13  | Gather additional information about pedestrian and active mode person travel                                                                      | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R2.14  | Improve information on and understanding of Māori views and needs from, use of, and involvement in transport                                      | <div></div>       | <div></div>             | <div></div>     | <div></div>     |

| Enduring questions by knowledge gaps |   |
|--------------------------------------|---|
| Small                                | 0 |
| Medium                               | 7 |
| Large                                | 6 |

Notes:

1. An "E" denotes an extension of the original recommended initiative.
2. For a full list of recommended initiatives by topic, please refer to Appendix 2.
3. Some of the enduring questions may contribute to more than one knowledge theme and may, therefore, be included in the tables for other knowledge themes.

FIGURE 8: THEME OVERVIEW – TRANSPORT IMPACTS

|  <p><b>Transport impacts</b></p> <p><b>Knowledge needs</b><br/> <b>Better understanding the size, exposure, valuation, interactions and influences of social, economic, cultural (including transport impacts for Māori as tangata whenua) and environmental impacts as well as the potential effects from mitigations</b></p> |                           |                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Topic                                                                                                                                                                                                                                                                                                                                                                                                           | Related enduring question |                                                                                                                                                                                                                                                                       |
| <p>T1</p> <p><b>Topic 1: Fleet</b></p>                                                                                                                                                                                                                                                                                                                                                                          | 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 1.5                    | 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?                                                                                |
| <p>T2</p> <p><b>Topic 2: People and society</b></p>                                                                                                                                                                                                                                                                                                                                                             | 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?                                                                                   |
| <p>T4</p> <p><b>Topic 4: Infrastructure and investment</b></p>                                                                                                                                                                                                                                                                                                                                                  | 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?                                                        |
| <p>T6</p> <p><b>Topic 6: Funding and revenue</b></p>                                                                                                                                                                                                                                                                                                                                                            | 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?                                    |
| <p>T7</p> <p><b>Topic 7: Regulation</b></p>                                                                                                                                                                                                                                                                                                                                                                     | 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? |
| <p>T9</p> <p><b>Topic 9: Economy</b></p>                                                                                                                                                                                                                                                                                                                                                                        | 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 9.5                    | What is the relationship between the existence and location of the transport network and transport services, and economic activity in New Zealand?                                                                                                                    |
| <p>T10</p> <p><b>Topic 10: Safety and health</b></p>                                                                                                                                                                                                                                                                                                                                                            | 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?                                                                                                                        |
| <p>T11</p> <p><b>Topic 11: Environment</b></p>                                                                                                                                                                                                                                                                                                                                                                  | EQ 11.1                   | In what ways and to what extent does the transport system impact on the environment, 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?                                                                                                   |



|                                 |        |                                                                                            | Impact            | Breadth of applications | Strategic value | Right resources |
|---------------------------------|--------|--------------------------------------------------------------------------------------------|-------------------|-------------------------|-----------------|-----------------|
| Scale                           |        | <div><div></div><div></div><div></div><div></div><div></div></div> <div>M H</div>          |                   |                         |                 |                 |
| High-priority initiatives       |        |                                                                                            | Assessment result |                         |                 |                 |
| Quick wins                      | R11.9  | Improve environmental impact evaluation around run-off of vehicle pollutants on road       | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R11.2  | Develop environment impact framework for emissions and infrastructure                      | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
| Other high-priority initiatives | R11.1  | Research into transport emissions profiles                                                 | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R10.1  | Develop health and safety risk profiles and exposures that leads to transport-related harm | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R9.2 E | Improve economic modelling oversight and governance function                               | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R11.10 | Collect information on impacts of weather and environmental-related network outages        | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R10.6  | Align injury classification definitions across different datasets                          | <div></div>       | <div></div>             | <div></div>     | <div></div>     |

| Enduring questions by knowledge gaps |   |
|--------------------------------------|---|
| Small                                | 2 |
| Medium                               | 8 |
| Large                                | 6 |

Notes:

1. An "E" denotes an extension of the original recommended initiative.
2. For a full list of recommended initiatives by topic, please refer to Appendix 2.
3. Some of the enduring questions may contribute to more than one knowledge theme and may therefore be included in the tables for other knowledge themes.

FIGURE 9: THEME OVERVIEW – SYSTEM PLANNING AND MANAGEMENT

| <br><b>System planning and management</b>                          |                           | <b>Knowledge needs</b><br><b>Better understanding of how users make transport decisions by mode, location and industry and how to measure monetary and non-monetary benefits and costs of transport as well as aligning with the cultural, spiritual, social, physical, economic and political dimensions of Māori well-being</b> |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Topic                                                                                                                                               | Related enduring question |                                                                                                                                                                                                                                                                                                                                   |  |
| <br><b>Topic 1: Fleet</b>                                          | 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 1.4                    | 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?                                                                                                                                                                               |  |
| <br><b>Topic 2: People and society</b>                             | EQ 2.1                    | How, when and in what numbers do people 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?                                                                                                             |  |
| <br><b>Topic 3: Freight</b>                                        | 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?                                                                                                                                                                  |  |
| <br><b>Topic 4: Infrastructure and investment</b>                | 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 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?                                                                                                                                               |  |
| <br><b>Topic 5: Transport integration and network resilience</b> | EQ 5.1                    | How is land being used, how does land use 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?                                                                                                                    |  |
|                                                                                                                                                     | 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 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?                                                                                                                                                                                                            |  |
| <br><b>Topic 7: Regulation</b>                                   | 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?                                                              |  |
| <br><b>Topic 8: Workforce</b>                                    | 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 transport 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, to train and up-skill its transport workforce, and how are these things changing, including modally, regionally, temporally and across roles?                                                                          |  |



|                                 |        |                                                                                                                                                                    | Impact            | Breadth of applications | Strategic value | Right resources |
|---------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------|-----------------|-----------------|
|                                 | Scale  | <div><div></div><div></div><div></div><div></div><div></div></div> <div>MH</div>                                                                                   |                   |                         |                 |                 |
| High-priority initiatives       |        |                                                                                                                                                                    | Assessment result |                         |                 |                 |
| Quick wins                      | R1.1   | Regularly publish vehicle fleet profiles, across all modes [also see recommended initiatives R1.4, R1.8, R1.9, R1.10 and R1.11]                                    | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R4.19  | Improve information on the capacity and use of local roads                                                                                                         | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R5.1   | Develop sector definition of resilience                                                                                                                            | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
| Other high-priority initiatives | R2.4   | Establish baseline information on ‘accessibility’                                                                                                                  | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R3.9 E | Repeat and enhance the National Freight Demand Study [this combines with recommended initiatives R1.12, R3.5, R3.7, R3.10 and R3.12]                               | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R5.2   | Improve and integrate transport network data with high-quality land use data                                                                                       | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R3.6 E | Develop geospatial capability to track freight and people movements [this combines with recommended initiative R1.15]                                              | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | 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] | <div></div>       | <div></div>             | <div></div>     | <div></div>     |
|                                 | R4.14  | Integrate road assessment and maintenance management [RAMM] data and improve its access                                                                            | <div></div>       | <div></div>             | <div></div>     | <div></div>     |

| Enduring questions by knowledge gaps |    |
|--------------------------------------|----|
| Small                                | 2  |
| Medium                               | 12 |
| Large                                | 8  |

Notes:

1. An "E" denotes an extension of the original recommended initiative.
2. For a full list of recommended initiatives by topic, please refer to Appendix 2.
3. Some of the enduring questions may contribute to more than one knowledge theme and may therefore be included in the tables for other knowledge themes.

FIGURE 10: THEME OVERVIEW – FUTURE FUNDING AND CHARGING

|  <p><b>Future funding and charging</b></p> |                           | <p><b>Knowledge needs</b></p> <p><b>Better understanding how transport cost burdens are distributed, how users respond to changes in cost and price, and what the impact on revenue and charging is of changing technologies and user needs.</b></p>          |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Topic                                                                                                                       | Related enduring question |                                                                                                                                                                                                                                                               |
| <p>T6</p> <p><b>Topic 6: Funding and revenue</b></p>                                                                        | 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?                                                                                                                                     |
| <p>T9</p> <p><b>Topic 9: Economy</b></p>                                                                                    | 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? |



|                                 |        |                                                                                                                                                      | Impact            | Breadth of applications | Strategic value | Right resources |
|---------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------|-----------------|-----------------|
|                                 |        | Scale                                                                                                                                                |                   |                         |                 |                 |
| High-priority initiatives       |        |                                                                                                                                                      | Assessment result |                         |                 |                 |
| Other high-priority initiatives | R6.2 E | Improve information on the cost of providing, operating and maintaining the transport network (this combines recommended initiatives R4.4 and R6.8). | <div></div>       | <div></div>             | <div></div>     | <div></div>     |

| Enduring questions by knowledge gaps |   |
|--------------------------------------|---|
| Small                                | 0 |
| Medium                               | 7 |
| Large                                | 0 |

Notes:

1. An "E" denotes an extension of the original recommended initiative.
2. For a full list of recommended initiatives by topic, please refer to Appendix 2.
3. Some of the enduring questions may contribute to more than one knowledge theme and may therefore be included in the tables for other knowledge themes.

## NEXT STEPS

**THIS DOMAIN PLAN IS A LONG-TERM STRATEGIC DOCUMENT THAT LOOKS AT INFORMATION NEEDS OVER 30 YEARS. OUR DECISIONS ON COLLECTING DATA ARE NOT MADE LIGHTLY AND NEED TO BE MADE WITH THE LONGER TERM IN MIND.**

# NEXT STEPS

**This first edition of the Domain Plan focuses on developing a shared understanding of transport data and information-related priorities for the sector to consider. It also includes the strategy that will actively fill the high-priority knowledge gaps.**

## Implementation planning

Existing data, statistics and information need to be utilised appropriately to achieve the goal of this Domain Plan. This requires actions to ensure safe and efficient sharing and use of such information. Seeking continuous improvement in the ways data, statistics and information are collected, shared and used is also paramount to achieving the goal of this Domain Plan. In turn these help to inform policy decisions that address long-term strategic issues for the sector.

Reflecting these needs, the recommendations of the Domain Plan have been categorised into six activity streams:

-  1. **Improving data access and publication** – this helps to ensure existing information can be used and its value can be maximised at agency level
-  2. **Improving data sharing, integration and governance** – this helps to ensure existing information can be used and its value can be maximised at the sector level
-  3. **Developing new methods, reviewing or improving current data, methods and processes** – this helps to ensure appropriate improvements are made to enhance the quality of current information collection, processing and analysis to provide the insights required
-  4. **Collecting new or additional data** – this closes information gaps identified
-  5. **Collecting or developing baseline data or information** – this requires developing an appropriate approach or methodology to measure a new idea, concept or topic for which some measurements, indicators or information already exist
-  6. **Developing research and capability** – this helps improve understanding of complex ideas, concepts or topics for which apparent measurements, indicators or information do not yet exist.

Implementation involves work across the six activity streams described above, some starting now and others dependent on completing earlier actions. A chart illustrating the activity streams applying to the priority initiatives is attached in Appendix 4. We will develop an implementation plan to provide a focus for priority initiatives in a three-year cycle. We will work with stakeholders to develop the first implementation plan during the second half of 2016 to reach agreement across the sector on shared responsibilities for advancing individual actions.

Implementing the high-priority initiatives outlined in this Domain Plan will not necessarily result in the knowledge gap being filled immediately. In some instances, it may take some years to accumulate enough information. Ongoing development and review of the Domain Plan needs will be built into the implementation plan.

### Immediate to long-term actions

This Domain Plan categorises the initiatives into different priority levels for the sector to pursue over the short to medium term.

The next phase of the project is to develop an implementation plan. This requires confirming the high-priority initiatives by assessing the relative costs and benefits from implementation. Once completed, we will work with the sector through the transport knowledge hubs to develop a timeframe and assign responsibilities to implement them.

The medium-term actions include considering the medium-priority initiatives by assessing the relative costs and benefits from implementation and identifying any priorities for the sector to take forward.

For certain knowledge gaps, it is necessary to develop a longer-term implementation plan. This is to make sure required information and knowledge can be accumulated to enhance the sector's ability to derive the insights needed to inform decisions.

### **Individual and collaborative responsibilities**

In this Domain Plan, the Ministry of Transport and Statistics New Zealand have established this first strategic case for improving the transport data, statistics and information on behalf of the transport sector.

The Ministry of Transport will support co-ordination of the efforts across the sector to develop the implementation plan as well as maintaining oversight of the implementation process. We envisage that some organisations may take responsibility for delivering some specific priorities but it is a collaborative responsibility to ensure that we are working together to implement the Domain Plan.

### **Encouraging collaboration**

Collaboration is the hallmark of the Research Strategy, the Information Strategy and Architecture and this Domain Plan to support evidence-based decision-making. There are a number of informal collaborative mechanisms already operating, and these should continue.

In addition to these informal networks, the major vehicle for collaboration is the development of the knowledge hubs. We will create a governance regime across the knowledge hubs, which will facilitate input from users and researchers as well as transport agencies.

### **Transport knowledge hubs**

The knowledge hubs offer a channel for the community to share data, statistics and information, research ideas and results. They will also help us to identify and close future knowledge gaps. The knowledge hubs will be supported to provide stewardship and leadership to implement the Domain Plan and the Research Strategy.

There has been sufficient interest already to establish knowledge hubs for aviation, forecasting, safety, household travel, economics and technology. The requirement and objectives for each knowledge hub may vary over time, and with the needs of the research community. As the research community works more closely together, additional knowledge hubs may be set up to meet specific research needs.

### **Governance of the transport knowledge hubs**

Establishing broader governance arrangements for the knowledge hubs will provide 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 knowledge hubs.

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

# KNOWLEDGE HUBS GOVERNANCE STRUCTURE AND PURPOSE

The proposed governance structure [see Figure 11] involves stakeholders working through leaders of the knowledge hubs and their members. This governance structure does not interfere with the internal communication and collaboration arrangements that are already operating.

To bring the wider sector voice into decision-making, and give investors and users the opportunity to be represented, we picture that the governance structure will include a cross-agency governance committee and three decision boards:

- ▶ the **Research Board** will make decisions around research priorities
- ▶ the **Evidence and Analytics Board** will make decisions around data, statistics and information
- ▶ the **Information Management Board** will make decisions around information governance, access, integration and management.

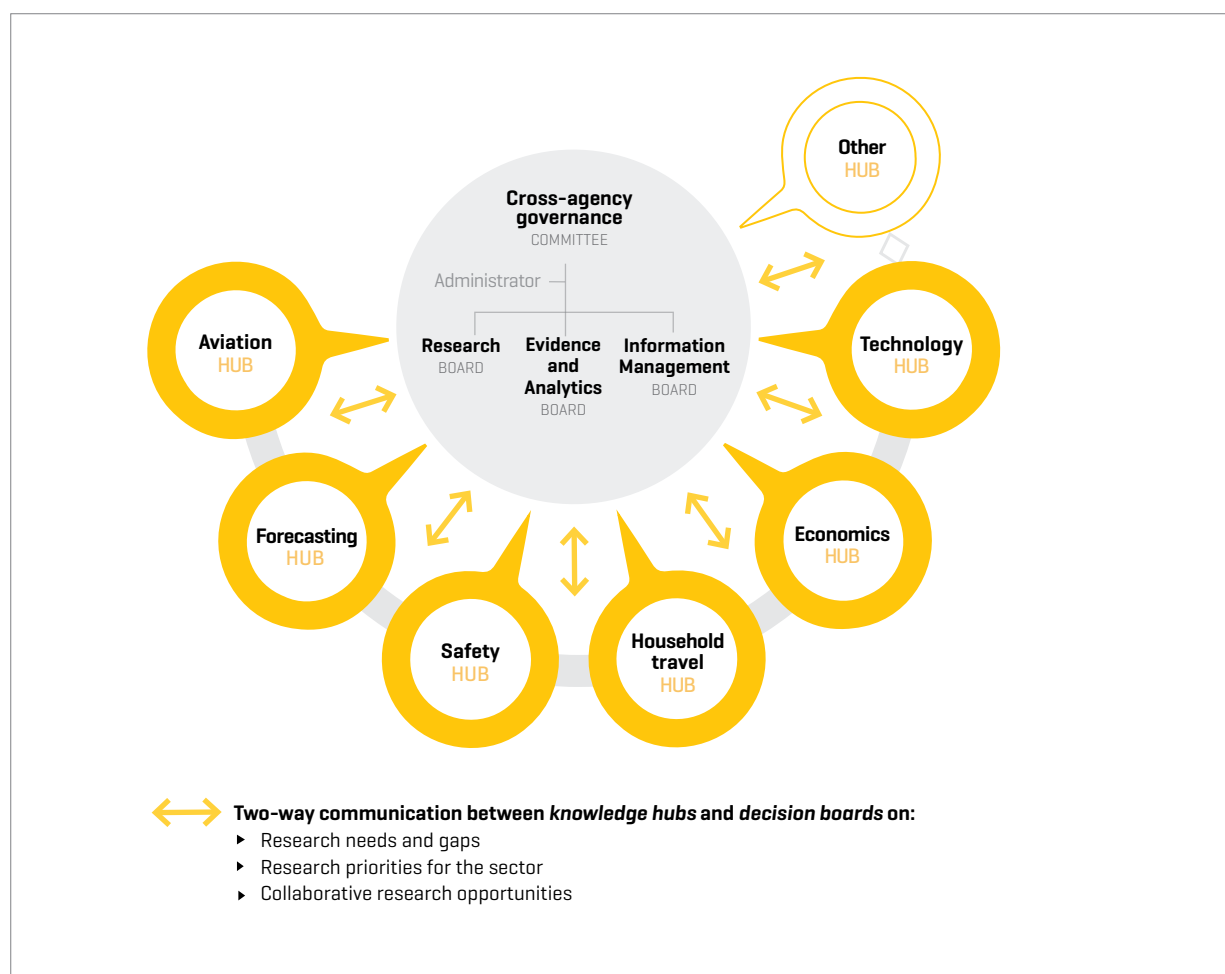
One of the initial tasks of the implementation plan will be to set up this structure, including setting out the agreed terms of reference for the governance committee and the decision boards.

The governance of the knowledge hubs has three key purposes [Figure 12]:

- ▶ lead the sector to develop and meet its transport knowledge needs, including helping implement the Domain Plan, the Research Strategy and the Information Strategy and Architecture
- ▶ consider the wider domestic and international contexts and opportunities when implementing the three pieces of work
- ▶ improve evidence-based decisions and capability building through information and knowledge sharing and development.<sup>4</sup>

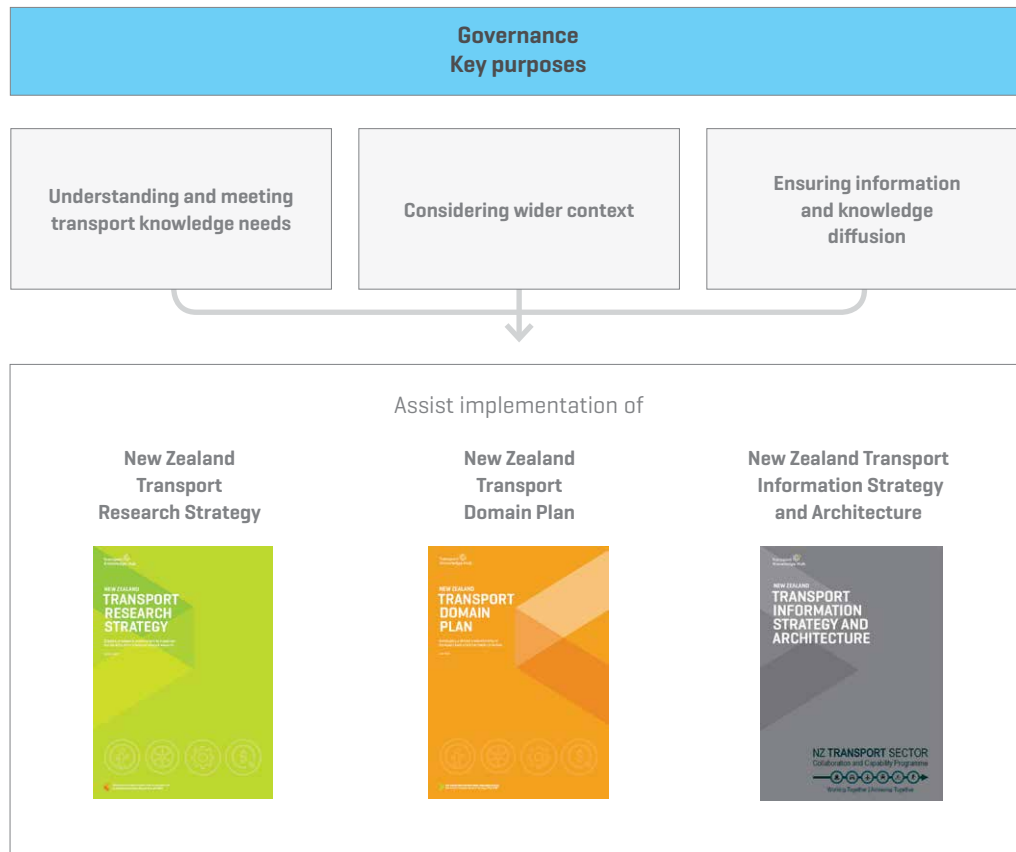
Once established, the leaders of the knowledge hubs will communicate with the decision boards on knowledge gaps and initiatives to fill them. In doing so, the leaders will consider the wider context as well as the opportunities to share and build knowledge. The decision boards will then make recommendations to the governance committee for consideration. These recommendations can potentially include decisions around resourcing and priorities for the agencies involved.

FIGURE 11: GOVERNANCE STRUCTURE FOR THE TRANSPORT KNOWLEDGE HUBS



<sup>4</sup> For ideas to assist sector capability building, please refer to the New Zealand Transport Research Strategy – 2016 – 2020.

FIGURE 12: PURPOSES OF THE GOVERNANCE STRUCTURE



### Governance principles for the transport knowledge hubs

The purpose of the knowledge hubs is to broaden the research, evidence, analytical and modelling knowledge, and build sector capacity and capability.

Governance arrangements for the knowledge hubs need to align with the principles in Figure 13.

### Ongoing development and periodic review

The knowledge hubs will have primary responsibility for implementing the Domain Plan and the Research Strategy. They will also monitor progress to enable the sector to regularly assess and review the nature and extent of knowledge gaps, and its ability to inform decisions to resolve strategic issues as they come up.

At a high level, we will know we have been successful in implementing this first edition of the Domain Plan when:

***The transport sector is increasingly able to access high-quality data and information to answer the enduring questions.***

This will involve developing assessment metrics to indicate an:

- ▶ increase in the number of enduring questions that can be answered
- ▶ increase in the number of private-public sector data and information-sharing partnerships.

Performance against this set of indicators will be reviewed annually, with a full review of progress against achievement of the Domain Plan goal taking place every four years starting in 2020.

FIGURE 13: GOVERNANCE PRINCIPLES FOR THE TRANSPORT KNOWLEDGE HUBS

| Governance principle                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Effective composition and performance</b>                                     | An effective governance body needs a balance of independence, skills, knowledge, experience and perspectives. Therefore, the management and organisation of the knowledge hubs should be flexible to allow the knowledge hubs to evolve and change to meet the needs of participants.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Strong leadership</b>                                                         | The governing body should lead and be seen to lead knowledge development for the transport sector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>High standards of ethical behaviour around knowledge building and sharing</b> | <p>The governance body should set high standards of ethical behaviour around sharing and building the knowledge of the sector and make sure these standards are clearly stated.</p> <p>These standards include:</p> <ul style="list-style-type: none"><li>▶ <b>value integration</b> – the knowledge hubs focus on whole-of-government benefits and shared benefits, not just benefits to individual organisations and any tendency for thinking in silos. The knowledge hubs commit to reduce duplication, increase collaboration and join up top-down and bottom-up aspects</li><li>▶ <b>transparent operation</b> – information and communication through the knowledge hubs [such as information related to the Domain Plan and the Research Strategy] should be open, unless there is good reason to keep it confidential</li><li>▶ <b>efficient operation</b> – the knowledge hubs commit to use existing resources more efficiently and effectively to derive greater value from existing information and knowledge</li><li>▶ <b>actions to add value</b> – the knowledge hubs commit to actions that add value to the sector as a whole.</li></ul> |
| <b>Effective communication and stakeholder management</b>                        | The governance body should have the ability to provide effective communications to the knowledge hubs and other stakeholders. It needs to be clear about the role of the knowledge hubs and the value to participants, and able to describe measures of success.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

# APPENDICES



# APPENDIX 1: LIST OF ENDURING QUESTIONS

## T1 TOPIC 1: TRANSPORT FLEET

| Knowledge needs | Understanding the characteristics of the transport fleet and, hence, the capability and capacity of vehicles using the system                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EQ1.1           | 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? |
| EQ1.2           | How is the fleet being used and how is this changing, including modally, temporally, regionally and nationally?                                                                                                               |
| EQ1.3           | 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?                               |
| EQ1.4           | 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?                                                                           |
| EQ1.5           | 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?                   |
| EQ1.6           | 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?                                        |

## T2 TOPIC 2: PEOPLE AND SOCIETY

| Knowledge needs | Understanding attitudes, perceptions and preferences of all transport users (including Māori) as well as the underlying factors that influence transport users' decisions                                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EQ 2.1          | How, when and in what numbers do people 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?                                                                                                                            |

Note: The word people in this table refers to people in general and in specific groups (including Māori as tangata whenua).

## T3 TOPIC 3: FREIGHT

| Knowledge needs | Understanding the volume and value of freight, how it is moved and whether it is moved efficiently                                                                                                                           |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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?                                                    |

#### T4 TOPIC 4: INFRASTRUCTURE AND INVESTMENT

| Knowledge needs | Understanding the value of capital stock, nature and extent of New Zealand's transport infrastructure across all modes and what the return on this investment is                                                                                                                                       |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 (note) 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?                                                                                                                    |

Note: These include iwi corporations.

#### T5 TOPIC 5: TRANSPORT INTEGRATION AND NETWORK RESILIENCE

| Knowledge needs | Understanding how land use affects the transport network across all modes                                                                                                                                                                                            |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EQ 5.1          | How is land being used, how does land use 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?                                                       |
| 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?                                                                                                                                               |

#### T6 TOPIC 6: TRANSPORT FUNDING AND REVENUE

| Knowledge needs | Understanding the cost of transport provision and use and how that relates to future 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?                                                                                                           |

#### T7 TOPIC 7: REGULATION

| Knowledge needs | Understanding what regulations apply and how effective they are across modes                                                                                                                                                                                         |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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?                                                     |

**T8** TOPIC 8: WORKFORCE

| Knowledge needs | Understanding the nature and extent of the transport workforce across modes                                                                                                                                                                                                             |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EQ 8.1</b>   | 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? |
| <b>EQ 8.2</b>   | 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?                                                               |
| <b>EQ 8.3</b>   | 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?                             |

**T9** TOPIC 9: ECONOMY

| Knowledge needs | Understanding the relationships between the transport networks, services and economic activities; and the role that location plays in the provision of economic transport networks                                                                            |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EQ 9.1</b>   | 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?                                                    |
| <b>EQ 9.2</b>   | 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?                                                                  |
| <b>EQ 9.3</b>   | 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?                                                              |
| <b>EQ 9.4</b>   | 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? |
| <b>EQ 9.5</b>   | What is the relationship between the existence and location of the transport network and transport services, and economic activity in New Zealand?                                                                                                            |

**T10** TOPIC 10: SAFETY AND HEALTH

| Knowledge needs | Understanding the risk profiles across transport modes and the factors that contribute to these risk profiles                                                                                                                                            |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EQ 10.1</b>  | 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?                                    |
| <b>EQ 10.2</b>  | 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? |
| <b>EQ 10.3</b>  | 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?                                |
| <b>EQ 10.4</b>  | What international transport safety and security obligations does New Zealand have, how well are these met, and how are these things changing?                                                                                                           |

**T11** TOPIC 11: ENVIRONMENT

| Knowledge needs | Understanding the types of emissions that come from the operation of the transport system                                                                           |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EQ 11.1</b>  | In what ways and to what extent does the transport system impact on the environment and how are these things changing, including spatially, modally and temporally? |
| <b>EQ 11.2</b>  | 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? |

# APPENDIX 2: LIST OF RECOMMENDED INITIATIVES

| Overarching recommendations |                                                                                                                                                                         |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>H1</b>                   | Improve access to and awareness of existing sources of transport information by publishing the Transport Domain Plan stocktake                                          |
| <b>H1 E</b>                 | Review the content of the 2015 Transport Domain Plan stocktake and investigate the best ways to publish and update the information – <i>this combines H1, H3 and H6</i> |
| <b>H2</b>                   | Investigate the opportunity for developing partnerships between the public, private and not-for-profit sectors to improve data and information sharing                  |
| <b>H3</b>                   | Enable data custodians and content owners to update and amend information sources of the stocktake                                                                      |
| <b>H4</b>                   | Develop a standardised monitoring and reporting approach to manage data and information generated from government funded transport-related projects                     |
| <b>H5</b>                   | Improve transport sector information governance                                                                                                                         |
| <b>H6</b>                   | Determine stocktake dissemination tool and assess information sources for inclusion                                                                                     |
| <b>H7</b>                   | Review the Transport Indicator Framework                                                                                                                                |
| <b>H8</b>                   | Identify and develop potential Tier 1 Statistics                                                                                                                        |
| <b>H9</b>                   | Enhance transport sector information systems to enable management of significant volumes of network level data that will be generated by intelligent transport systems  |

## T1 TOPIC 1: TRANSPORT FLEET

| Knowledge needs | Understanding the characteristics of the transport fleet and, hence, the capability and capacity of vehicles using the system                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>R1.1</b>     | Regularly publish vehicle fleet profiles, across all modes                                                                                                               |
| <b>R1.2</b>     | Gather information on methods and locations of disposal of vehicles, across all modes                                                                                    |
| <b>R1.3</b>     | Gather information on disposal of vehicle related waste                                                                                                                  |
| <b>R1.4</b>     | Develop an aviation fleet profile                                                                                                                                        |
| <b>R1.5</b>     | Upgrade the aircraft database to include avionics status of aircraft to be captured and integrated with other information about the physical characteristics of aircraft |
| <b>R1.6</b>     | Gather information on how aircraft are used for domestic freight purposes                                                                                                |
| <b>R1.7</b>     | Streamline the categories used to classify the reported nature of flights                                                                                                |
| <b>R1.8</b>     | Develop a maritime commercial fleet profile                                                                                                                              |
| <b>R1.9</b>     | Develop a maritime recreational fleet profile                                                                                                                            |
| <b>R1.10</b>    | Develop a fleet profile for specialist wharf-side fleets                                                                                                                 |
| <b>R1.11</b>    | Develop a rail fleet profile                                                                                                                                             |
| <b>R1.12</b>    | Explore a data partnership with rail operators to share rail data – <i>to be combined with R3.9</i>                                                                      |
| <b>R1.13</b>    | Enhance road fleet statistics by integrating ownership data                                                                                                              |
| <b>R1.14</b>    | Integrate road vehicle fleet data held in disparate sources                                                                                                              |
| <b>R1.15</b>    | Develop geospatial capability to track people movements – <i>to be combined with R3.6</i>                                                                                |

**T2** TOPIC 2: PEOPLE AND SOCIETY

| Knowledge needs | Understanding attitudes, perceptions and preferences of all transport users (including Māori) as well as the underlying factors that influence transport users' decisions |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>R2.1</b>     | Improve awareness of and access to information from the New Zealand Household Travel Survey                                                                               |
| <b>R2.2</b>     | Identify the need for oversampling in the New Zealand Household Travel Survey for different population groups                                                             |
| <b>R2.3</b>     | Improve geographic data on the distribution and location of people with disabilities                                                                                      |
| <b>R2.4</b>     | Establish baseline information on 'accessibility'                                                                                                                         |
| <b>R2.5</b>     | Expand the scope of travel surveys to include commercial person travel                                                                                                    |
| <b>R2.6</b>     | Improve access to high-quality public transport patronage data                                                                                                            |
| <b>R2.7</b>     | Gather additional information on the reasons why people don't travel – <i>to be combined with R2.8</i>                                                                    |
| <b>R2.8 E</b>   | Gather additional information on people's attitudes, preferences and perceptions about transport – <i>to be combined with R2.7</i>                                        |
| <b>R2.9</b>     | Gather additional person centric data about domestic air travel                                                                                                           |
| <b>R2.10</b>    | Gather information about Cook Strait passenger trips                                                                                                                      |
| <b>R2.11</b>    | Improve information on recreational boating participation rates                                                                                                           |
| <b>R2.12</b>    | Gather information about intercity and inter-region person travel by rail                                                                                                 |
| <b>R2.13</b>    | Gather additional information about pedestrian and active mode person travel                                                                                              |
| <b>R2.14</b>    | Improve information and understanding of Māori views and needs from, use of, and involvement in transport                                                                 |

Note: An "E" denotes an extension of the original recommended initiative.

**T3** TOPIC 3: FREIGHT

| Knowledge needs | Understanding the volume and value of freight, how it is moved and whether it is moved efficiently                     |
|-----------------|------------------------------------------------------------------------------------------------------------------------|
| <b>R3.1</b>     | Develop baseline estimates on the annual New Zealand freight spend                                                     |
| <b>R3.2</b>     | Develop an agreed approach and set of indicators for monitoring freight efficiency                                     |
| <b>R3.3</b>     | Establish baseline information on non-containerised freight movements                                                  |
| <b>R3.4</b>     | Develop guidance for public-private freight data partnerships between government agencies and industry operators       |
| <b>R3.5</b>     | Develop baseline data on non-categorised or unrecorded light freight – <i>to be combined with R3.9</i>                 |
| <b>R3.6 E</b>   | Develop geospatial capability to track freight and people movements – <i>to be combined with R1.15</i>                 |
| <b>R3.7</b>     | Develop baseline information on urban freight – <i>to be combined with R3.9</i>                                        |
| <b>R3.8</b>     | Develop a method for determining and recording data on the final destination of imports and exports                    |
| <b>R3.9 E</b>   | Repeat and enhance the National Freight Demand Study – <i>this combines R1.12, R3.5, R3.7, R3.10 and R3.12</i>         |
| <b>R3.10</b>    | Improve collection of and access to data on domestic air freight – <i>to be combined with R3.9</i>                     |
| <b>R3.11</b>    | Improve integration of different classification systems for maritime freight                                           |
| <b>R3.12</b>    | Develop a workable approach to collecting data from operators on Cook Strait freight – <i>to be combined with R3.9</i> |
| <b>R3.13</b>    | Investigate whether data on the number of road freight vehicle movements could be established as Tier 1 statistics     |

Note: An "E" denotes an extension of the original recommended initiative.

**T4** TOPIC 4: INFRASTRUCTURE AND INVESTMENT

| Knowledge needs | Understanding the value of capital stock, nature and extent of New Zealand's transport infrastructure across all modes and what the return on this investment is |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>R4.1 E</b>   | Research into the monetary and non-monetary returns on investment in transport infrastructure at a network level – <i>this combines with R4.18</i>               |
| <b>R4.2</b>     | Establish and implement a set of baseline assumptions for use in transport-related business cases                                                                |
| <b>R4.3</b>     | Build data partnerships with commercial providers to improve access to data about transport infrastructure                                                       |
| <b>R4.4</b>     | Develop a transport infrastructure performance benchmarking tool or framework – <i>to be combined with R6.2 and R6.8</i>                                         |
| <b>R4.5</b>     | Improve access to publicly held information about investment in, and the performance of, airports                                                                |
| <b>R4.6</b>     | Establish baseline data about the condition of airport infrastructure                                                                                            |
| <b>R4.7</b>     | Improve collection of data on seaport infrastructure condition                                                                                                   |
| <b>R4.8</b>     | Implement benchmarking and ongoing monitoring of seaport capacity and utilisation rates                                                                          |
| <b>R4.9</b>     | Produce annual summary information on the state of New Zealand's sea ports                                                                                       |
| <b>R4.10</b>    | Improve collection of information about maritime navigational infrastructure                                                                                     |
| <b>R4.11</b>    | Establish a minimum rail infrastructure dataset and publish it annually                                                                                          |
| <b>R4.12</b>    | Review the Road Assessment and Maintenance Management database to ensure consistency                                                                             |
| <b>R4.13</b>    | Develop detailed data collections about non-road land transport infrastructure                                                                                   |
| <b>R4.14</b>    | Integrate road assessment and maintenance management (RAMM) data and improve its access                                                                          |
| <b>R4.15</b>    | Conduct research into privately owned roading infrastructure                                                                                                     |
| <b>R4.16</b>    | Improve systems to allow integration of data about investment in road network infrastructure                                                                     |
| <b>R4.17</b>    | Develop an agreed set of outcome indicators for assessing the Government Policy Statement on Land Transport                                                      |
| <b>R4.18</b>    | Research into the non-monetary returns on investment in transport infrastructure at a network level – <i>to be combined with R4.1</i>                            |
| <b>R4.19</b>    | Improve information on the capacity and use of local roads                                                                                                       |
| <b>R4.20</b>    | Gather additional data on investment in public transport infrastructure                                                                                          |

Note: An "E" denotes an extension of the original recommended initiative.

**T5** TOPIC 5: TRANSPORT INTEGRATION AND NETWORK RESILIENCE

| Knowledge needs | Understanding how land use affects the transport network across all modes             |
|-----------------|---------------------------------------------------------------------------------------|
| <b>R5.1</b>     | Develop sector definition of resilience                                               |
| <b>R5.2</b>     | Integrate transport network and land use data                                         |
| <b>R5.3</b>     | Establish baseline information on air transport integration                           |
| <b>R5.4</b>     | Gather information about passenger congestion at airports                             |
| <b>R5.5</b>     | Gather information about aircraft congestion at airports                              |
| <b>R5.6</b>     | Gather information on Cook Strait passenger and freight volumes                       |
| <b>R5.7</b>     | Conduct research into the integration of seaports with their surrounding environments |

**T6** TOPIC 6: TRANSPORT FUNDING AND REVENUE

| Knowledge needs | Understanding the cost of transport provision and use and how that relates to future funding and revenue                                       |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>R6.1</b>     | Supplement revenue data with industry data to enable industry level analysis of revenue                                                        |
| <b>R6.2 E</b>   | Improve information on the cost of providing, operating and maintaining the transport network – <i>this combines with R4.4 and R6.8</i>        |
| <b>R6.3</b>     | Conduct research into where and how the incidence of transport-related costs are borne                                                         |
| <b>R6.4</b>     | Improve the way that information on aviation passenger levies is collected                                                                     |
| <b>R6.5</b>     | Gather additional information on the total costs of air travel for passengers                                                                  |
| <b>R6.6</b>     | Develop performance summary reports on the airport industry                                                                                    |
| <b>R6.7</b>     | Develop industry summary reports on seaports                                                                                                   |
| <b>R6.8</b>     | Improve access to information on the costs of providing, operating and maintaining the rail network – <i>to be combined with R4.4 and R6.2</i> |
| <b>R6.9</b>     | Develop a profile of the costs of using private motor vehicles                                                                                 |

Note: An "E" denotes an extension of the original recommended initiative.

**T7** TOPIC 7: REGULATION

| Knowledge needs | Understanding what regulations apply and how effective they are across modes            |
|-----------------|-----------------------------------------------------------------------------------------|
| <b>R7.1</b>     | Improve monitoring and evaluation of transport regulatory effectiveness                 |
| <b>R7.2</b>     | Consolidate information on non-legislative regulatory effort                            |
| <b>R7.3</b>     | Conduct research into attitudes and behaviour towards regulation                        |
| <b>R7.4</b>     | Develop a national picture of maritime regulations                                      |
| <b>R7.5</b>     | Enhance infringement management operational systems to enable statistical interrogation |

**T8** TOPIC 8: WORKFORCE

| Knowledge needs | Understanding the nature and extent of the transport workforce across modes                    |
|-----------------|------------------------------------------------------------------------------------------------|
| <b>R8.1</b>     | Develop transport industry workforce profiles                                                  |
| <b>R8.2</b>     | Conduct research into the transport workforce's uptake and use of technology                   |
| <b>R8.3</b>     | Gather data on aviation workforce ethnicity                                                    |
| <b>R8.4</b>     | Improve understanding of, demand for and supply of aviation workforce                          |
| <b>R8.5</b>     | Conduct research into aviation workforce training and retention rates                          |
| <b>R8.6</b>     | Improve access to data on certificated seafarers and develop industry workforce profiles       |
| <b>R8.7</b>     | Develop baseline information on the risk-profile of the owner-operator and employed workforces |

**T9** TOPIC 9: ECONOMY

| Knowledge needs | Understanding the relationships between the transport networks, services and economic activities and the role that location plays in the provision of economic transport networks |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>R9.1</b>     | Develop a transport satellite account                                                                                                                                             |
| <b>R9.2</b>     | Improve economic modelling oversight and governance function                                                                                                                      |

**T10** TOPIC 10: SAFETY AND HEALTH

| Knowledge needs | Understanding the risk profiles across transport modes and the factors that contribute to these risk profiles |
|-----------------|---------------------------------------------------------------------------------------------------------------|
| <b>R10.1</b>    | Develop health and safety risk profiles and exposures that lead to transport-related harm                     |
| <b>R10.2</b>    | Integrate data sources to develop transport harm cost profiles                                                |
| <b>R10.3</b>    | Review methods for updating the Value of Statistical Life                                                     |
| <b>R10.4</b>    | Develop and publish risk profiles that lead to harm incidents for recreational boating                        |
| <b>R10.5</b>    | Integrate data sources to improve insight into visiting drivers' risk profile                                 |
| <b>R10.6</b>    | Align injury classification definitions across different datasets                                             |
| <b>R10.7</b>    | Improve data collection about injuries suffered on the pedestrian network                                     |

**T11** TOPIC 11: ENVIRONMENT

| Knowledge needs | Understanding the types of emissions that come from the operation of the transport system   |
|-----------------|---------------------------------------------------------------------------------------------|
| <b>R11.1</b>    | Research into transport emissions profiles                                                  |
| <b>R11.2</b>    | Develop environmental impact framework for emissions and infrastructure                     |
| <b>R11.3</b>    | Conduct strategic environmental horizon scanning                                            |
| <b>R11.4</b>    | Gather data on weather-related delays in the aviation sector                                |
| <b>R11.5</b>    | Gather additional data on intentional/permitted discharges from ships                       |
| <b>R11.6</b>    | Conduct research into the impact of large ships on local environments while in port         |
| <b>R11.7</b>    | Improve data collection, reporting and monitoring of the impact of ships on marine wildlife |
| <b>R11.8</b>    | Conduct research into the lifecycle emissions of electric vehicles [completed]              |
| <b>R11.9</b>    | Improve environmental impact evaluation around run-off of vehicle pollutants on road        |
| <b>R11.10</b>   | Collect information on impacts of weather and environmental-related network outages         |

# APPENDIX 3: MAPPING OF ENDURING QUESTIONS AND RECOMMENDED INITIATIVES

| Enduring questions | Gap status | Associated recommended initiatives |       |        |       |       |       |       |       |       |       |       |       |       |       |      | Total number of recommended initiatives |    |
|--------------------|------------|------------------------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-----------------------------------------|----|
| EQ1.1              | Small gap  | R1.1                               | R1.4  | R1.5   | R1.8  | R1.9  | R1.10 | R1.11 |       |       |       |       |       |       |       |      | 7                                       |    |
| EQ 1.2             | Large gap  | R1.6                               | R1.7  | R1.12  | R1.15 |       |       |       |       |       |       |       |       |       | 4     |      |                                         |    |
| EQ 1.3             | Medium gap | R11.1                              | R11.8 |        |       |       |       |       |       |       |       |       |       | 2     |       |      |                                         |    |
| EQ 1.4             | Medium gap | R1.13                              | R1.14 |        |       |       |       |       |       |       |       |       |       | 2     |       |      |                                         |    |
| EQ 1.5             | Medium gap | R1.2                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 1.6             | Medium gap | R1.3                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 2.1             | Medium gap | R2.1                               | R2.2  | R2.5   | R2.6  | R2.9  | R2.10 | R2.11 | R2.12 | R2.13 | R2.14 | R5.6  |       |       | 11    |      |                                         |    |
| EQ 2.2             | Large gap  | R2.2                               | R2.3  | R2.4   | R2.7  | R2.14 |       |       |       |       |       |       |       |       | 5     |      |                                         |    |
| EQ 2.3             | Large gap  | R2.7                               | R2.8  | R2.14  |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ2.4              | Large gap  | R2.14                              |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 3.1             | Medium gap | R3.3                               | R3.4  | R3.5   | R3.6  | R3.7  | R3.8  | R3.9  | R3.10 |       |       |       |       |       | 8     |      |                                         |    |
| EQ 3.2             | Large gap  | R3.3                               | R3.4  | R3.5   | R3.6  | R3.7  | R3.9  | R3.10 | R3.11 | R3.12 | R5.6  |       |       |       | 10    |      |                                         |    |
| EQ 3.3             | Large gap  | R3.1                               | R3.3  | R3.4   | R3.5  | R3.6  | R3.7  | R3.9  | R3.10 | R3.13 |       |       |       |       | 9     |      |                                         |    |
| EQ 3.4             | Medium gap | R3.2                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 4.1             | Small gap  | R4.3                               | R4.6  | R4.7   | R4.8  | R4.9  | R4.10 | R4.11 | R4.12 | R4.13 | R4.14 | R4.15 | R4.16 | R4.19 | R4.20 | R6.6 | R6.7                                    | 16 |
| EQ 4.2             | Medium gap | R4.1                               | R4.2  | R4.3   | R4.4  | R4.16 | R4.17 | R4.18 | R6.7  | R9.2  |       |       |       |       |       |      |                                         | 9  |
| EQ 4.3             | Large gap  | R4.3                               | R4.5  | R4.15  | R4.16 | R4.20 | R6.6  |       |       |       |       |       |       |       |       |      |                                         | 6  |
| EQ 4.4             | Medium gap | R4.2                               | R4.4  | R4.16  | R4.17 | R6.7  |       |       |       |       |       |       |       |       |       |      |                                         | 5  |
| EQ 5.1             | Medium gap | R5.2                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 5.2             | Large gap  | R5.2                               | R5.3  | R5.7   |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ 5.3             | Large gap  | R5.4                               | R5.5  | R6.6   |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ 5.4             | Medium gap | R5.2                               | R5.6  | R5.7   |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ 5.5             | Large gap  | R5.2                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 5.6             | Medium gap | R5.1                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 6.1             | Medium gap | R6.2                               | R6.8  | R9.2   |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ 6.2             | Medium gap | R6.3                               | R6.5  | R6.9   |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ 6.3             | Medium gap | R6.1                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 6.4             | Medium gap | R6.2                               | R6.3  | R6.4   | R6.8  |       |       |       |       |       |       |       |       |       | 4     |      |                                         |    |
| EQ 7.1             | Medium gap | R7.1                               | R7.2  | R7.3   | R7.4  |       |       |       |       |       |       |       |       |       | 4     |      |                                         |    |
| EQ 7.2             | Medium gap | R7.3                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 7.3             | Medium gap | R7.3                               | R7.5  |        |       |       |       |       |       |       |       |       | 2     |       |       |      |                                         |    |
| EQ 8.1             | Medium gap | R8.4                               |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 8.2             | Medium gap | R8.1                               | R8.2  | R8.3   | R8.6  | R8.7  |       |       |       |       |       |       |       |       | 5     |      |                                         |    |
| EQ 8.3             | Medium gap | R8.4                               | R8.5  |        |       |       |       |       |       |       |       |       | 2     |       |       |      |                                         |    |
| EQ 9.1             | Large gap  | R4.1                               | R4.2  | R4.4   | R4.5  | R4.18 | R9.1  | R9.2  |       |       |       |       |       |       | 7     |      |                                         |    |
| EQ 9.2             | Medium gap | R4.3                               | R4.4  | R4.5   | R6.2  | R6.3  | R6.5  | R6.8  | R6.9  | R9.2  | R10.2 | R10.4 |       |       | 11    |      |                                         |    |
| EQ 9.3             | Medium gap | R3.2                               | R3.3  | R3.5   | R3.7  | R3.9  | R3.13 | R4.8  |       |       |       |       |       |       | 7     |      |                                         |    |
| EQ 9.4             | Medium gap | R3.3                               | R3.8  | R3.9   |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ 9.5             | Large gap  | R3.3                               | R3.6  | R3.9   | R4.1  | R4.2  | R4.3  | R9.2  |       |       |       |       |       |       | 7     |      |                                         |    |
| EQ 10.1            | Small gap  | R10.2                              |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 10.2            | Large gap  | R10.1                              | R10.4 | R10.5  | R10.6 |       |       |       |       |       |       |       |       | 4     |       |      |                                         |    |
| EQ 10.3            | Large gap  | R10.2                              | R10.3 | R10.7  |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |
| EQ 10.4            | Small gap  | R10.5                              |       |        |       |       |       |       |       |       |       |       | 1     |       |       |      |                                         |    |
| EQ 11.1            | Medium gap | R11.1                              | R11.2 | R11.3  | R11.5 | R11.6 | R11.7 | R11.8 | R11.9 |       |       |       |       |       | 8     |      |                                         |    |
| EQ 11.2            | Large gap  | R11.3                              | R11.4 | R11.10 |       |       |       |       |       |       |       |       |       | 3     |       |      |                                         |    |

Note: Depending on the nature of a recommended initiative, it can be matched to more than one enduring question.

■ = high-priority initiatives  
■ = medium-priority initiatives

# APPENDIX 4: SUMMARISED HIGH-PRIORITY INITIATIVES BY KNOWLEDGE THEME AND ACTIVITY STREAM

|  <b>User behaviour and needs</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  <b>Transport impacts</b> |                                                                                                                                                                                                                                                                                                                                                                                    |  <b>System planning and management</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  <b>Future funding and charging</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R3.2                                                                                                             |  Develop approach to monitor freight efficiency* \$\$                                                                                                                                                                                                                                                                                                                                                             | R11.1                                                                                                      |  Research into transport emission profiles \$\$                                                                                                                                                                                                                                                   | R2.4                                                                                                                    |  Establish baseline accessibility information \$\$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | R6.2 E                                                                                                                 |  Improve information on the cost of providing, operating and maintaining the transport network [R6.2] this includes: <ul style="list-style-type: none"> <li>  Improve access to data on the rail network [R6.8]             </li> <li>  Develop infrastructure benchmarking tools [R4.4]             </li> </ul> \$\$\$ |
| R2.8 E                                                                                                           |  Survey user behaviour and preferences: <ul style="list-style-type: none"> <li>  Collect information on user attitudes and preferences [R2.8] \$\$             </li> <li>  Research into why people don't travel [R2.7]             </li> </ul> | R11.2                                                                                                      |  Develop environmental impact framework \$\$                                                                                                                                                                                                                                                      | R4.19                                                                                                                   |  Improve information on local roads capacity and utilisation \$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | R10.1                                                                                                      |  Develop health and safety risk profiles [and exposure] \$\$                                                                                                                                                                                                                                      | R1.1                                                                                                                    |  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 \$                                                                                                                                                                                                                                   | R3.9 E                                                                                                                  |  Repeat and enhance the National Freight Demand Study [R3.9]; this includes: <ul style="list-style-type: none"> <li>  Improve access to domestic airfreight data [R3.10] *             </li> <li>  Establish data partnership with Cook Strait freight and rail operators [R3.12 and R1.12] \$\$\$ #             </li> <li>  Collect baseline data on unrecorded light and urban freight [R3.5 and R3.7]             </li> </ul> |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| R2.13                                                                                                            |  Collect data on active travel [walking & cycling] \$                                                                                                                                                                                                                                                                                                                                                             | R9.2 E                                                                                                     | Improve economic modelling by developing: <ul style="list-style-type: none"> <li>  modelling oversight [R9.2] \$\$\$             </li> <li>  a set of key baseline assumptions [R4.2] *             </li> </ul> |                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| R2.14                                                                                                            |  Improve information and understanding of Māori needs from, use of, and involvement in transport \$\$                                                                                                                                                                                                                                                                                                             |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| R2.6                                                                                                             |  Improve access to public transport patronage data \$                                                                                                                                                                                                                                                                                                                                                           | R11.10                                                                                                     |  Impacts of weather- and environment-related network outages \$\$                                                                                                                                                                                                                               |                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| R2.1                                                                                                             |  Improve access to Household Travel Survey data \$                                                                                                                                                                                                                                                                                                                                                              | R10.6                                                                                                      |  Align injury classification definitions across databases \$\$\$ #                                                                                                                                                                                                                              | R5.1                                                                                                                    |  Develop sector definition of resilience * \$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                    | R5.2                                                                                                                    |  Integrate transport network and land use data \$\$ #                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                    | R3.6 E                                                                                                                  | Develop geospatial capability to track freight and people movements: <ul style="list-style-type: none"> <li>  Establish data partnership with freight operators [R3.6]             </li> <li>  Develop approach for tracking people movements [R1.15]             </li> </ul> \$\$                                                                                                                                                                                                                                                                                                                |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                    | R4.1                                                                                                                    |  Research into returns on investment including both monetary [R4.1] and non-monetary [R4.18] returns \$\$\$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                    | R4.14                                                                                                                   |  Integrate RAMM data and improve access \$\$ #                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Keys:

- E Cluster of initiatives as an extension of a specific individual initiative
- \$ Low cost and effort for an individual initiative or a cluster of initiatives
- \$\$ Medium cost and effort for an individual initiative or a cluster of initiatives
- \$\$\$ High cost and effort for an individual initiative or a cluster of initiatives
- \$ Cost estimates with an underline indicate costs are one-off
- # indicates areas with system costs
- \* indicates areas with some current research activity
-  Improve data access and publication
-  Improve data sharing, integration and governance
-  Develop new methods, review or improve current data, methods and/or processes
-  Collect new or additional data
-  Collect or develop baseline data
-  Develop research and capability
- Top 9
- Top 10 to 17
- Top 18 to 23

Note: For a detailed description of the recommended initiatives, please refer to Appendix 2.

# APPENDIX 5: GLOSSARY

## Activity streams

The six streams of activity identified to start implementing the recommended initiative are to:

- improve data access and publication
- improve data sharing, integration and governance
- develop new methods, review or improve current data, methods and/or processes
- collect new or additional data
- collect or develop baseline data
- develop research and capability.

## Data and information ecosystem

A data and information ecosystem encompasses the policies, strategies, processes, information, technologies, applications and stakeholders that together make up the research and information environment for New Zealand. A data and information ecosystem is supported by individuals who create, buy, sell, regulate, manage and use research and information.

## Data custodians

Data custodians are responsible for the safe custody, transport and storage of data. They are also responsible for the technical environment and database structure.

## Data, statistics and information

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

## Data stewards

Data stewards play an important role in data management and they are responsible for data content, context and the development of associated business rules.

## Enduring questions

Enduring questions are the big picture strategic-level questions that 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.

## Impact

The tangible and intangible effects or consequences of an action upon the outcome targeted.

## Knowledge themes

The four knowledge themes for the Domain Plan and the Research Strategy are:

- user behaviour and needs
- transport impacts
- system planning and management
- future funding and charging.

## Outcomes

The evident results or consequences of a plan of action.

## Transport knowledge hubs

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

## 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

A system for moving people or goods and comprises the assets (including conveyance, vehicle and infrastructure), institutional and funding systems (policies, procedures, regulations, rules, schedules or timetables) and the transport sector.

## Triple-4 framework

An analytical tool to assist members of the research community to develop and prioritise research and knowledge needs. This framework was developed as part of the *New Zealand Transport Research Strategy 2016-2020*.

# APPENDIX 6: LIST OF STAKEHOLDERS

## Development of this Domain Plan required knowledge from a wide range of subject matter experts.

The following organisations have participated in various stages of the domain planning process. The engagement activities included a series of stakeholder meetings and information sessions, formal submissions of knowledge gaps, priorities or written feedback and sector-wide workshops<sup>5</sup>. The inputs from these organisations are gratefully acknowledged.

Accident Compensation Corporation  
Auckland Council  
Auckland Transport  
CCS Disability Action  
Civil Aviation Authority  
Commerce Commission  
Customs New Zealand  
Energy Efficiency and Conservation Authority  
Greater Wellington Regional Council  
Hastings District Council  
Horizons District Council  
Land Information New Zealand  
Local Government New Zealand  
Maritime New Zealand  
Ministry for Primary Industries  
Ministry for the Environment

Ministry of Business, Innovation and Employment  
Ministry of Education  
Ministry of Foreign Affairs and Trade  
Ministry of Health  
Ministry of Justice  
Ministry of Social Development  
New Zealand Police  
New Zealand Transport Agency  
New Zealand Treasury  
Productivity Commission  
Reserve Bank of New Zealand  
Ruapehu District Council  
Southland District Council  
Te Puni Kōkiri  
Transport Accident Investigation Commission  
Transport Information Managers Group (representing various transport agencies)  
Waikato Regional Council  
Wellington City Council  
Worksafe New Zealand

<sup>5</sup> Three workshops were held during the domain planning process – enduring questions workshop (16 October 2014), gap analysis workshop (29 July 2015), and options development workshop (16 March 2016).



1.



2.



3.\*

### Related documents

Read this Domain Plan in conjunction with:

1. New Zealand Transport Research Strategy. Online PDF at: [www.transport.govt.nz/transport-research-strategy.pdf](http://www.transport.govt.nz/transport-research-strategy.pdf)
2. Full List of Recommendations. Online PDF at: [www.transport.govt.nz/full-list-recommendations.pdf](http://www.transport.govt.nz/full-list-recommendations.pdf)
3. New Zealand Transport Information Strategy and Architecture  
\* Under development, to be published 2017/18

### Disclaimers

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