

NEW ZEALAND TRANSPORT SECTOR

STRATEGIC CHALLENGES AND RELATED ACTIONS MAP

June 2017



Transport Sector Strategic Challenges

June 2017

Why do we need to know?

As population and technology change and international economies become more globalised, the sector is facing a number of challenges around how we fund, build, and manage our transport system.

A key overarching question is what transport system do we need or want to meet the needs of users? Having a clear set of strategic challenges can help us understand what is important to us and what might be impeding us from having a transport system that maximises social and economic impacts and minimises harm.

What are they?

Strategic challenges are difficult issues, tasks, or situations that require concerted effort to be addressed successfully. Knowing what strategic challenges are helps us to set priorities to make sure things are done in the right order to achieve the goals. However, the term 'strategic challenges' is not synonymous with the term 'priorities'. Priorities refer to things that take precedence over others, even though they might not relate to the challenges we are facing.

In terms of meeting data, information, and research needs, having a list of strategic challenges helps to answer what we need to achieve our goals. When considered in conjunction with the Transport Domain Plan, Transport Research Strategy, and the Triple-4 knowledge development and prioritisation framework, we can identify data, information, and research priorities.

The Cross-Agency Governance Committee (CAGC) identified the following seven inter-related strategic challenges (SC) facing the sector when addressing multi-dimensional and interrelated transport issues effectively and efficiently:

- SC1 What are the right mechanisms and technologies for managing transport demand?
- SC2 How best to maximise the benefits of transport through best modal choice?
- SC3 How best to minimise harm (safety and health)?
- SC4 How best to improve the agility and resilience of the transport system?
- SC5 How best to seize the opportunities arising from technological developments?
- SC6 How best to lower transport-related environmental impacts?
- SC7 How best to maintain international connectedness to facilitate economic development?

The knowledge needed to help address these strategic challenges includes:

- understanding user preferences and behaviour
- understanding and influencing demand
- understanding and measuring system performance
- identifying, quantifying, and valuing transport benefits
- understanding effectiveness and efficiency of interventions

The relationships between strategic challenges and knowledge needs are summarised in the table overleaf.

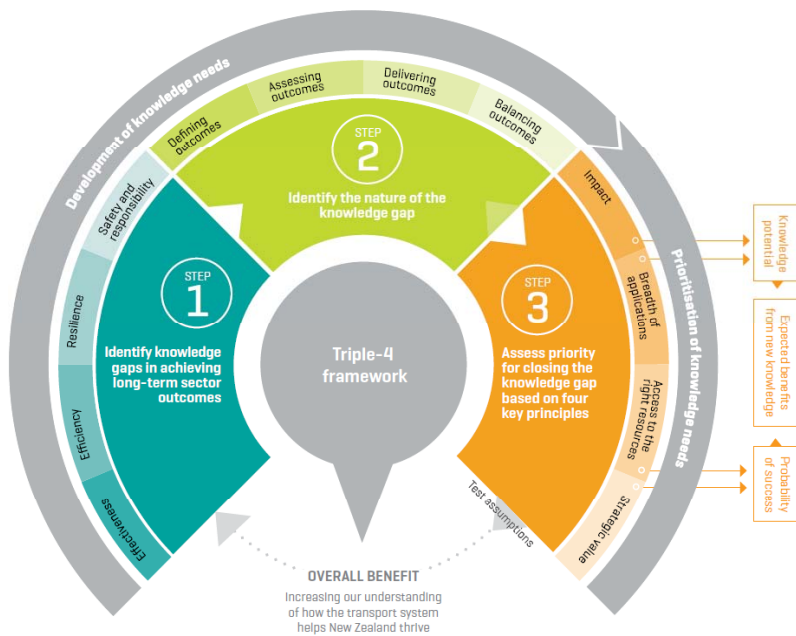
The strategic challenges listed capture ideas shared by the CAGC at a specific time. These strategic challenges will resonate differently with individual agencies. Agencies will have their own perspectives on the state of existing knowledge to identify specific research requirements.

The CAGC will review and update the strategic challenges every 12 to 18 months.

Strategic challenges	Focus area for the next 1-3 years	Knowledge needs
SC1 What are the right mechanisms and technologies for managing transport demand?	Technologies provide potential for funding and charging mechanisms (such as time-based and location-based charging) that were previously not feasible. What are the roles of transport demand management in land use and urban development? What does a comprehensive well designed approach to ensure a smooth transition towards implementation of demand pricing look like?	<ul style="list-style-type: none"> • Demand pricing options need to be understood in terms of all the knowledge themes: we need to understand the fiscal, infrastructure, business, social, and access impacts.
SC2 How best to maximise benefits of transport through best modal choice?	<p>The most effective and efficient transport or access activity considers modes as a system and chooses the right mode from that system. What is the best modal choice and how best to encourage that choice (considering changing land use and urban development patterns)?</p> <p>We need system metrics so that we can monitor the provision and operation of the transport system against characteristics we value. How do we ensure that meaningful and compatible data is used for managing the provision and operation of the transport system?</p>	<p>To choose the best interventions or mode choice and to achieve the right level of resilience, we need to:</p> <ul style="list-style-type: none"> • understand user preferences and behaviours so that we know how best to influence their decisions and target measures to influence or encourage transport demand, choice, and behaviour • have a robust approach to quantify and value transport impacts so we can assess the costs and benefits of interventions
SC3 How best to minimise harm (safety and health)?	Technologies, education, engineering, and enforcement have made big transport safety gains over time, but we know decisions by individuals are still causing unnecessary harms. What are the best interventions to influence safer behaviours and to minimise health impacts?	<ul style="list-style-type: none"> • understand the effectiveness and efficiency of interventions so we can make the right decision • understand and measure system performance so we can improve system planning and management to make better policy, operational, infrastructure construction and maintenance decisions (considering transport and related impacts including land use, urban and regional development).
SC4 How best to improve the agility and resilience of the transport system?	We need to understand how social, economic, and environmental events (such as increased uptake of technologies, changes in land use and location decisions, changes in global trade patterns, changing weather patterns, and earthquakes) may affect our transport system (eg getting people where they need to go and getting goods to markets). Then, what do we need to do to ensure the right level of resilience?	<ul style="list-style-type: none"> • understand the effectiveness and efficiency of interventions so we can make the right decision • understand and measure system performance so we can improve system planning and management to make better policy, operational, infrastructure construction and maintenance decisions (considering transport and related impacts including land use, urban and regional development).
SC5 How best to seize the opportunities arising from technological developments?	As technologies emerge, the interplay between travel, infrastructure, and technology may change. What are the systems and capabilities we need so as to take advantage of the technology opportunities and to manage the challenges? Where do we want to be responsive and where do we want to lead?	<p>We need to understand</p> <ul style="list-style-type: none"> • the system requirements so we can better plan and manage uptake of technologies • the impacts that technology opportunities can have on user behaviour and needs and the resulting transport impacts.
SC6 How best to lower transport-related environmental impacts?	While delivering the transport system to help New Zealand thrive, which interventions are best for lowering greenhouse gas emissions and protecting the environment that New Zealand people and businesses value?	See knowledge needs for SC2, SC3 and SC4 above
SC7 How best to maintain international connectedness to facilitate economic development?	What opportunities and challenges, advantages and disadvantages does New Zealand have being far away from international markets? What are the roles of transport? How are these changing (eg bigger ships) and can we manage changes through transport-related interventions?	<p>To understand the roles of transport in maintaining international connectedness, we need to</p> <ul style="list-style-type: none"> • understand user perspectives and needs (including those of both New Zealanders and our international suppliers and customers) • have a robust approach to quantify and value transport impacts.

Investing in the right research

Triple-4 knowledge development and prioritisation framework for delivering transport sector outcomes



What tool to use to develop and prioritise research?

The Triple-4 knowledge development and prioritisation framework is designed to help research funders and providers get a good understanding of knowledge needs to assist with prioritising investments in policy, research and information gathering. It has three components, each with four elements and it is designed to be iterative.

The structure

- i. Define the purpose of a knowledge development initiative
- ii. Clearly define the problem or opportunity for research
- iii. Develop and define a proposed response
- iv. Follow the Triple-4 framework process to assess and prioritise the proposed response

The Triple-4 framework process

- **Step 1:** Identifies knowledge gaps to achieving long-term sector outcomes, which include effectiveness, efficiency, resilience, safety and responsibility.
- **Step 2:** Identifies the nature and extent of the knowledge gaps in defining, assessing, delivering and balancing outcomes.
- **Step 3:** Assesses the priority of knowledge needs by testing against the four principles :
 - **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?
 - **Access to 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/challenges faced by the sector? Is this the right time to do this research considering the strategic issues/challenges?

What research is the transport sector investing in to address the strategic challenges?

The NZ Transport Agency manages the sector’s research programme and invests, through its research programme, in innovative and relevant research that contributes to achieving the government’s goals for transport and to addressing the strategic challenges.

The list of strategic challenges was not available at the time when the NZ Transport Agency developed the 2015-18 Research Programmes. This chart provides an indicative picture of investment by strategic challenge for the three years to June 2018.

Apart from the NZ Transport Agency, the Ministry of Transport, Maritime New Zealand, Civil Aviation Authority, Local Government New Zealand, and the NZ Automobile Association also invest in transport-related research.

The next section summaries the Actions Map that has been developed for each strategic challenge, outlining the key research activities of the Ministry of Transport, the NZ Transport Agency and other agencies.

NZ Transport Agency Research Programme investment to address strategic challenges (total \$10 million, 2015-18)

Strategic challenge	Commitment 2015/16	Commitment 2016/17	Commitment 2017/18
Managing transport demand	4 stacks of coins	2 stacks of coins	2 stacks of coins
Encouraging best modal choice	2 stacks of coins	10 stacks of coins	4 stacks of coins
Minimising transport-related harm	6 stacks of coins	10 stacks of coins	4 stacks of coins
Resilience	3 stacks of coins	4 stacks of coins	2 stacks of coins
Technological challenges	1 stack of coins	4 stacks of coins	2 stacks of coins
Lowering transport-related environmental impacts	2 stacks of coins	4 stacks of coins	2 stacks of coins
International connectedness and economic development	0 stacks of coins	1 stack of coins	2 stacks of coins

Actions map of data, information, and research projects

Strategic Challenge 1: What are the right mechanisms and technologies for managing transport demand?

Strategic challenge description

Technologies provide potential for funding and charging mechanisms (such as time-based and location-based charging) previously not feasible.

What are roles of transport demand management in land use and urban development?

What does a comprehensive well designed approach to ensure a smooth transition towards implementation of demand pricing look like?

Links to other strategic challenges

SC2

SC4

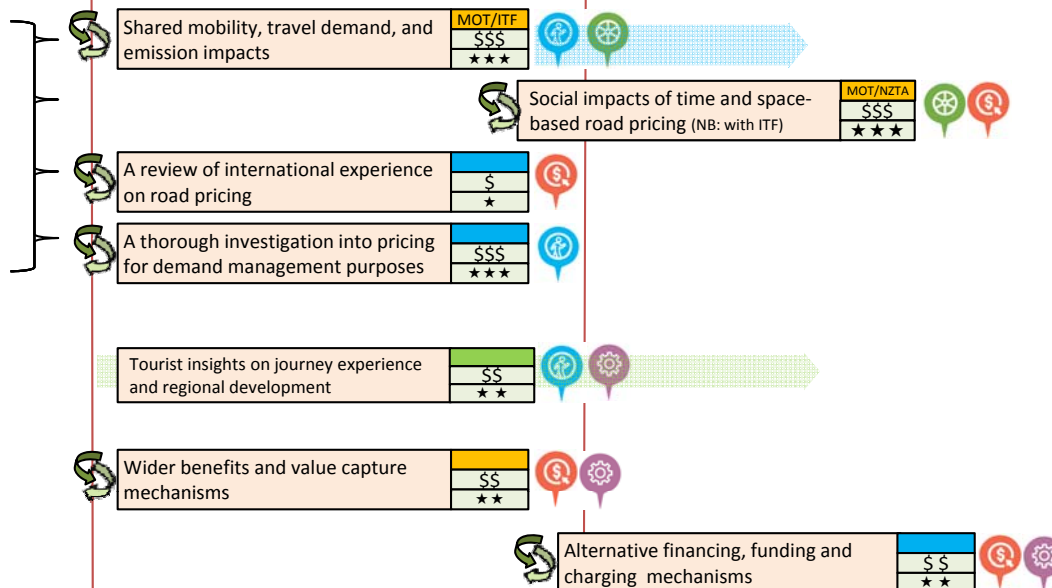
SC3

SC4

NOW – Active projects

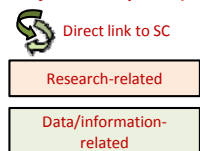
Next (subject to funding)

Later (subject to funding)

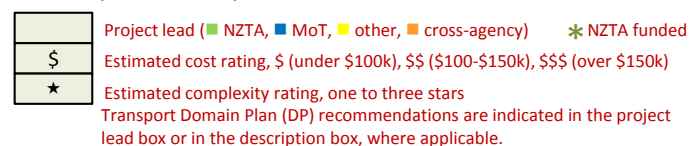


- Key:**
- SC = strategic challenge
 - SC1 manage transport demand
 - SC2 best modal choice
 - SC3 minimise harm
 - SC4 resilience
 - SC5 technology challenges
 - SC6 lower environmental impacts
 - SC7 international connectedness

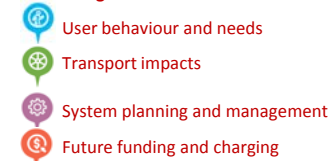
Project description (LHS of the box)



Side bars (RHS of the box)



Knowledge themes



Actions map of data, information, and research projects

Strategic Challenge 2: How best to maximise benefits of transport through best modal choice

Strategic challenge description

The most effective and efficient transport or access activity considers modes as a system and chooses the right mode from that system.

What is the best modal choice and how best to encourage that choice (considering changing land use and urban development patterns)?

We need system metrics so that we can monitor the provision and operation of the transport system against characteristics we value.

How do we ensure that meaningful and compatible data is used for managing the provision and operation of the transport system?

Links to other strategic challenges

SC1

SC3

SC6

SC6

SC3

SC4

NOW – Active projects

Next (subject to funding)

Later (subject to funding)

Better understand accessibility in New Zealand DP R2.4
\$\$
**

A pilot study on relative value of non-market transport impacts *
\$\$

Modelling the co-benefits of increased mode shift to cycling \$
**

Next Generation of New Zealand Transport Models \$\$\$

Impacts of demographic changes on the land transport system *
\$
**

Driver licensing and employment project \$\$
**

Develop approaches to estimate regional input-output tables \$\$

Methods to assess performance of transport interventions \$\$\$

Condition assessment of unsealed roads \$\$
**

Framework to understand actual returns from investment (DP R4.1) *
\$\$

Research into Māori views on transport DP R3.14
\$\$
**

Review Transport Indicators framework DP H7
\$
*

Improve information on local roads capacity and utilisation DP R4.19
\$\$\$
**

Review Transport Domain Plan Stocktake DP H1E
\$\$
**

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Project description (LHS of the box)

Direct link to SC

Research-related

Data/information-related

Side bars (RHS of the box)

- Project lead (■ NZTA, ■ MoT, ■ other, ■ cross-agency) * NZTA funded
- Estimated cost rating, \$ (under \$100k), \$\$ (\$100-\$150k), \$\$\$ (over \$150k)
- Estimated complexity rating, one to three stars
- Transport Domain Plan (DP) recommendations are indicated in the project lead box or in the description box, where applicable.

Knowledge themes

- User behaviour and needs
- Transport impacts
- System planning and management
- Future funding and charging

Actions map of data, information, and research projects

Strategic Challenge 3: How best to minimise harm (safety and health)?

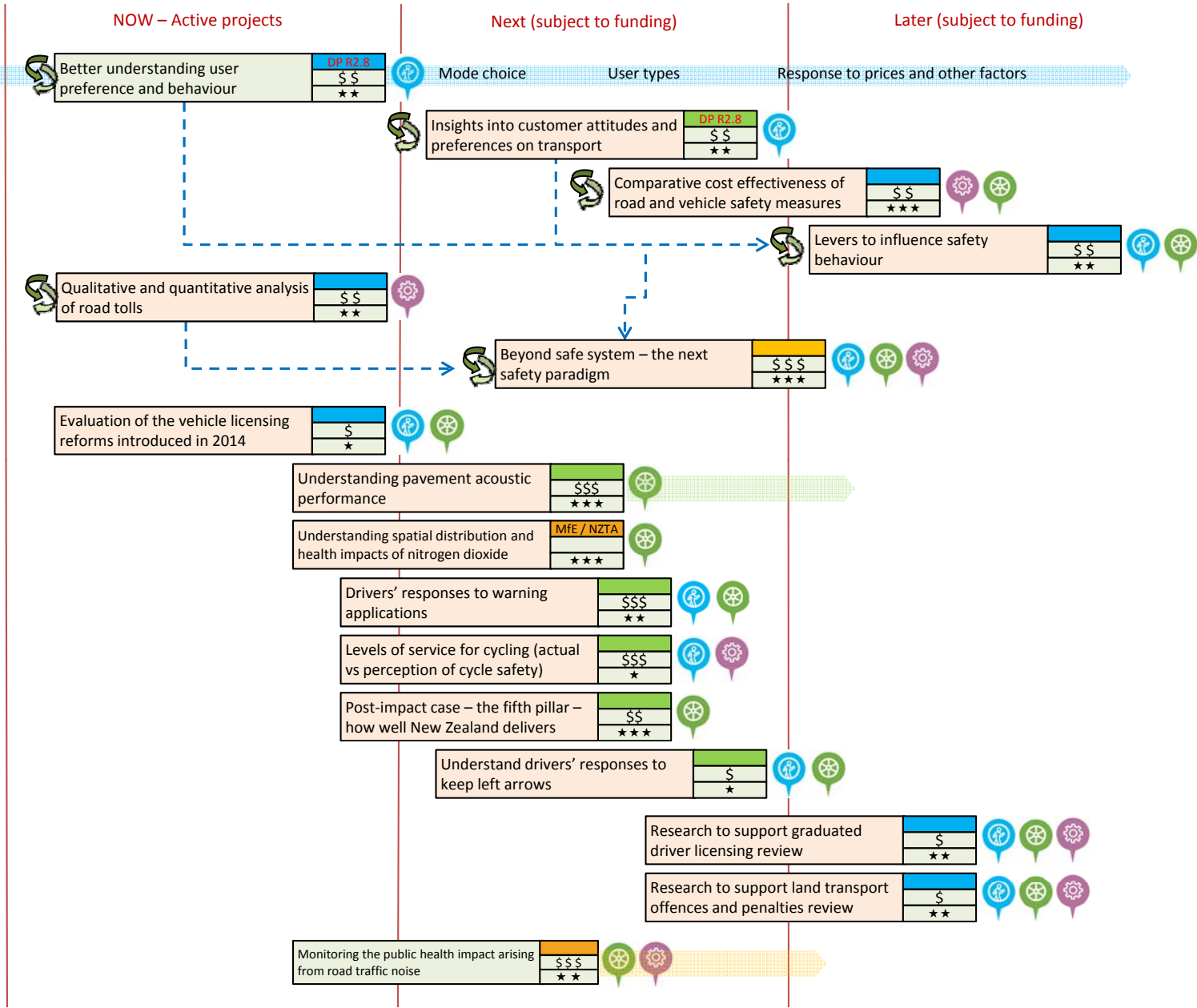
Strategic challenge description

Technologies, education, engineering, and enforcement have made big transport safety gains over time, but we know decisions by individuals are still causing unnecessary harms.

What are the best interventions to influence safer behaviours and to minimise health impacts?

Links to other strategic challenges

- SC1
- SC2
- SC6



- Key:**
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 - SC1 manage transport demand
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 - SC4 resilience
 - SC5 technology challenges
 - SC6 lower environmental impacts
 - SC7 international connectedness

Project description (LHS of the box)

- Direct link to SC
- Research-related
- Data/information-related

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Knowledge themes

- User behaviour and needs
- Transport impacts
- System planning and management
- Future funding and charging

Actions map of data, information, and research projects

Strategic Challenge 4: How best to improve the agility and resilience of the transport system?

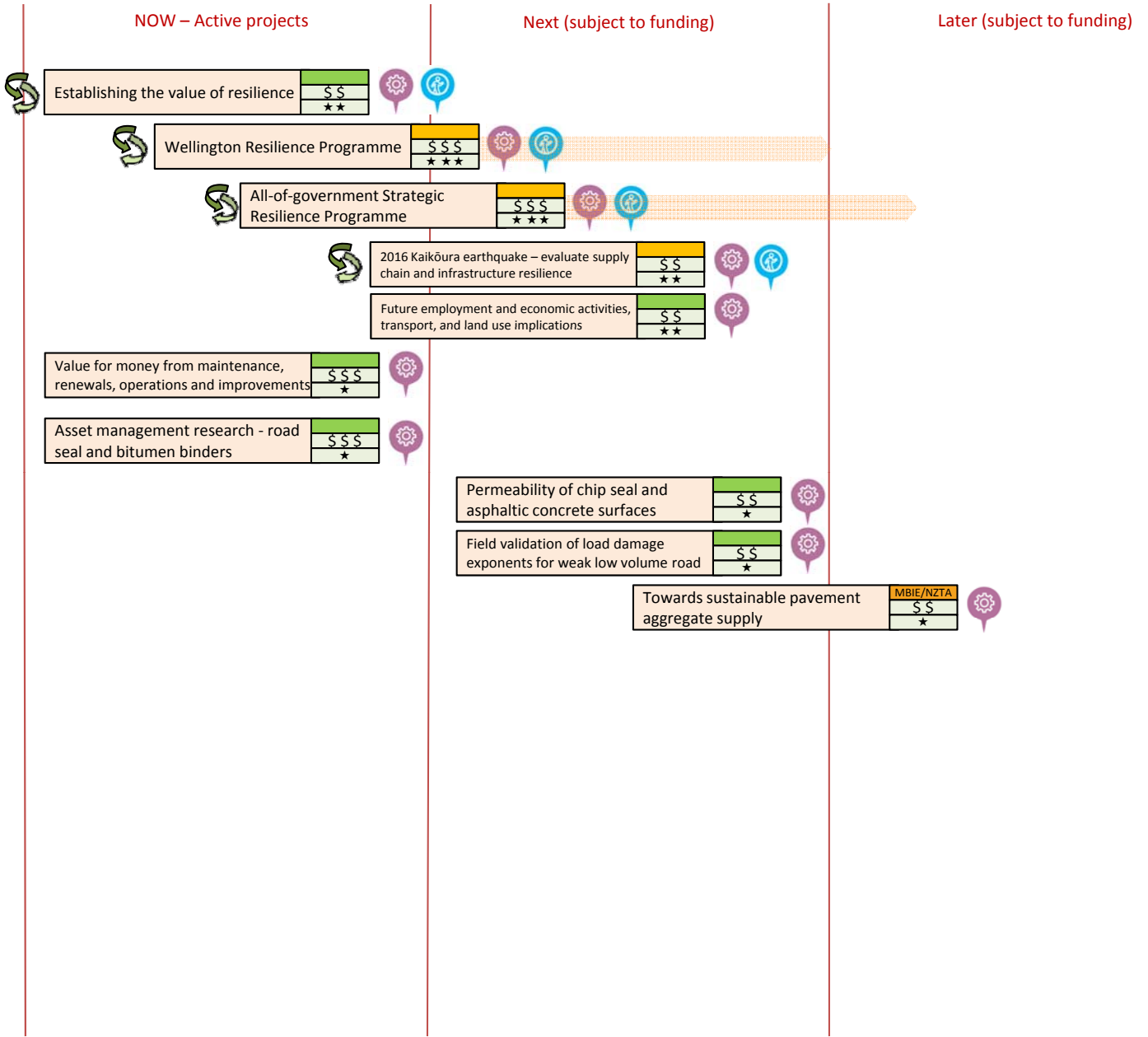
Strategic challenge description

We need to understand how social, economic, and environmental events (such as increased uptake of technologies, changes in land use and location decisions, changes in global trade patterns, changing weather patterns, and earthquakes) may affect our transport system (eg getting people where they need to go and getting goods to markets).

What do we need to do to ensure the right level of resilience?

Links to other strategic challenges

SC1 SC2



- Key:**
- SC = strategic challenge
 - SC1 manage transport demand
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 - SC3 minimise harm
 - SC4 resilience
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- Knowledge themes**
- User behaviour and needs
 - Transport impacts
 - System planning and management
 - Future funding and charging

Actions map of data, information, and research projects

Strategic Challenge 5: How best to seize the opportunities arising from technological developments?

Strategic challenge description

As technologies emerge, the interplay between travel, infrastructure, and technology may change.

What are the systems and capabilities that we need to take advantage of the technology opportunities and manage the challenges?

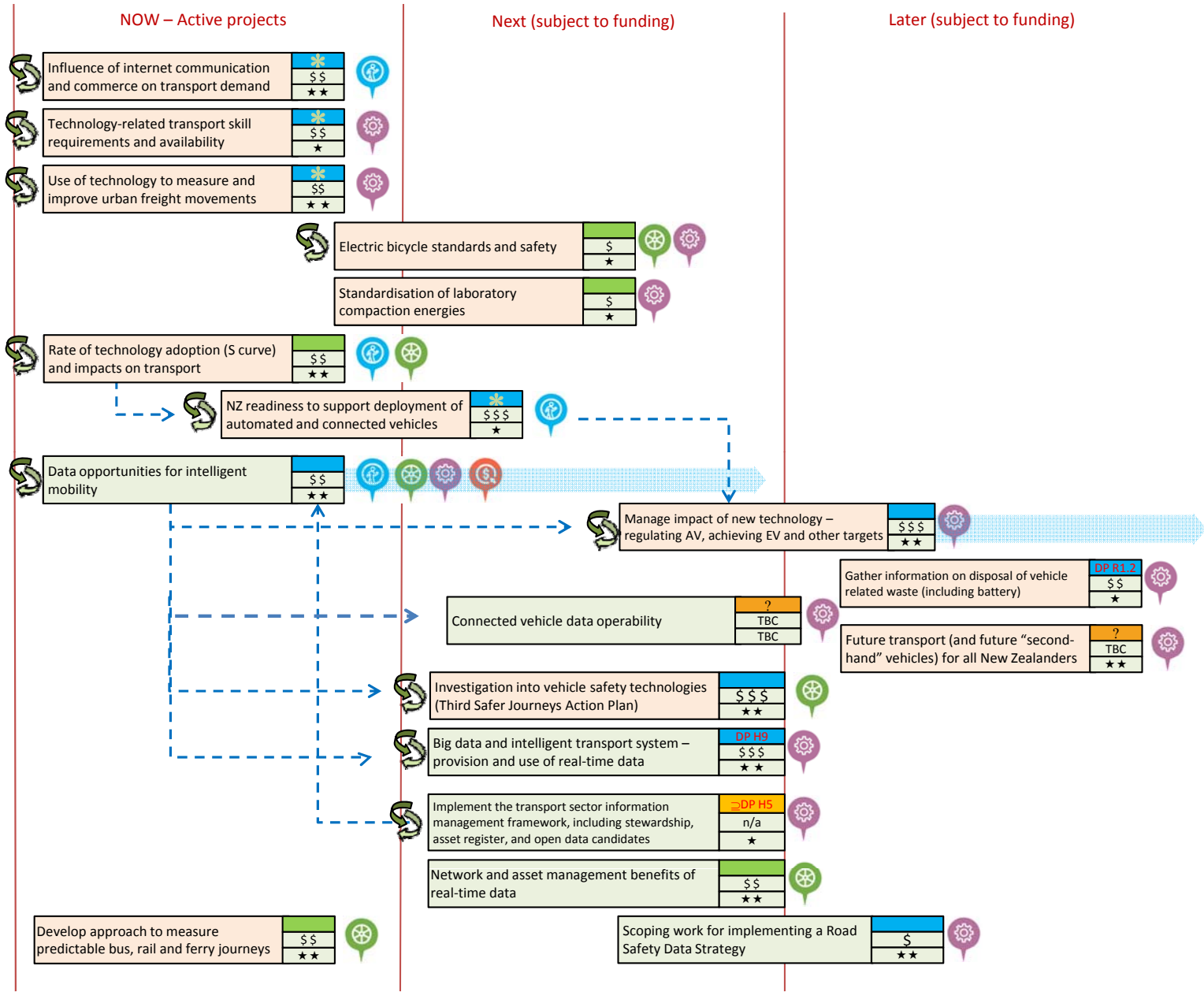
Where do we want to be responsive and where do we want to lead?

Links to other strategic challenges

SC7

SC4

SC3



- Key:**
- SC = strategic challenge
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- Knowledge themes**
- User behaviour and needs
 - Transport impacts
 - System planning and management
 - Future funding and charging

Actions map of data, information, and research projects

Strategic Challenge 6: How best to lower transport related environmental impacts?

Strategic challenge description

While delivering the transport system to help New Zealand thrive, which interventions are best for lowering greenhouse gas emissions and protecting the environment that New Zealand people and businesses value?

Links to other strategic challenges

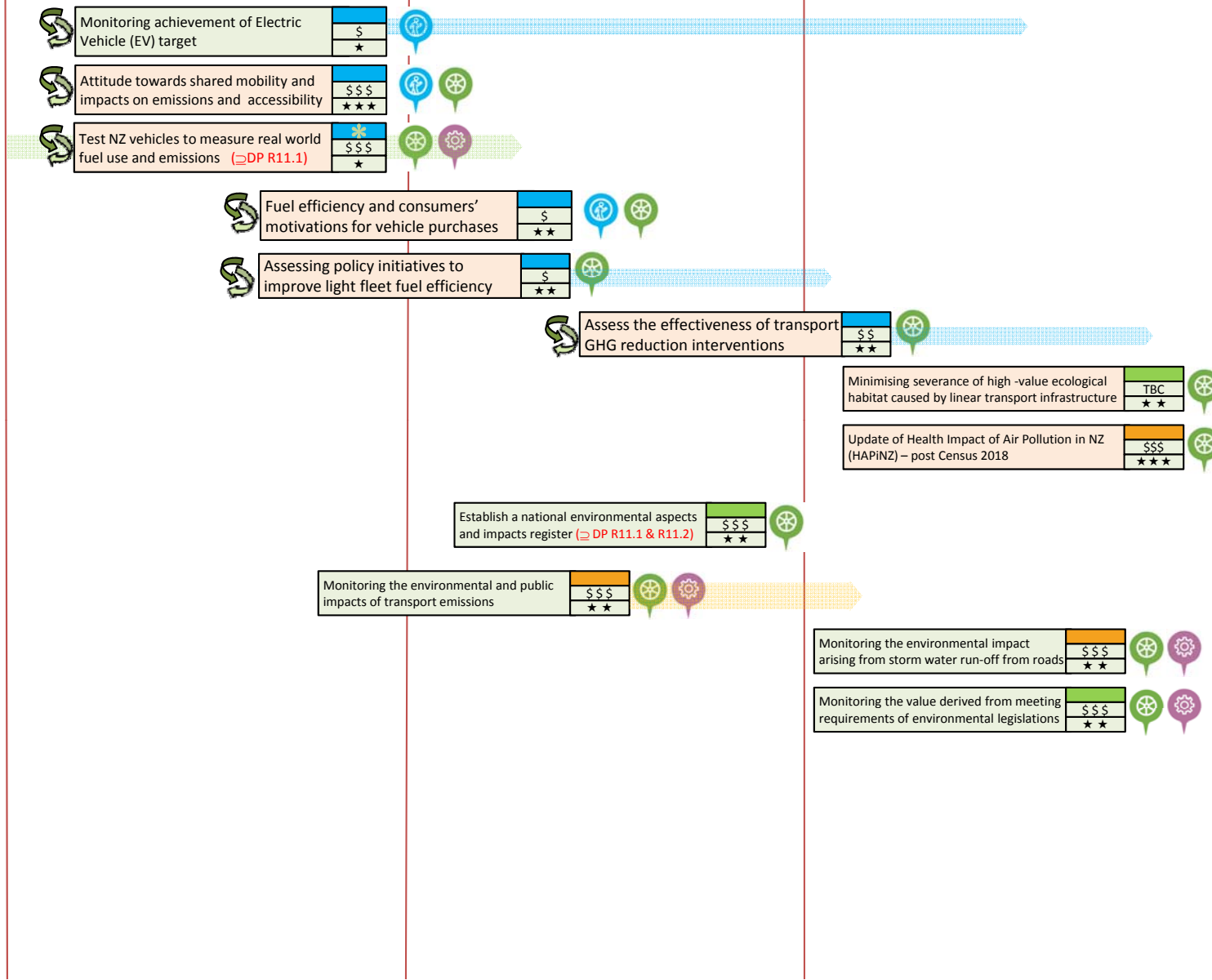
SC5

SC2

NOW – Active projects

Next (subject to funding)

Later (subject to funding)



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Knowledge themes

- User behaviour and needs
- Transport impacts
- System planning and management
- Future funding and charging

Actions map of data, information and research projects

Strategic Challenge 7: How best to maintain international connectedness to facilitate economic development?

Strategic challenge description

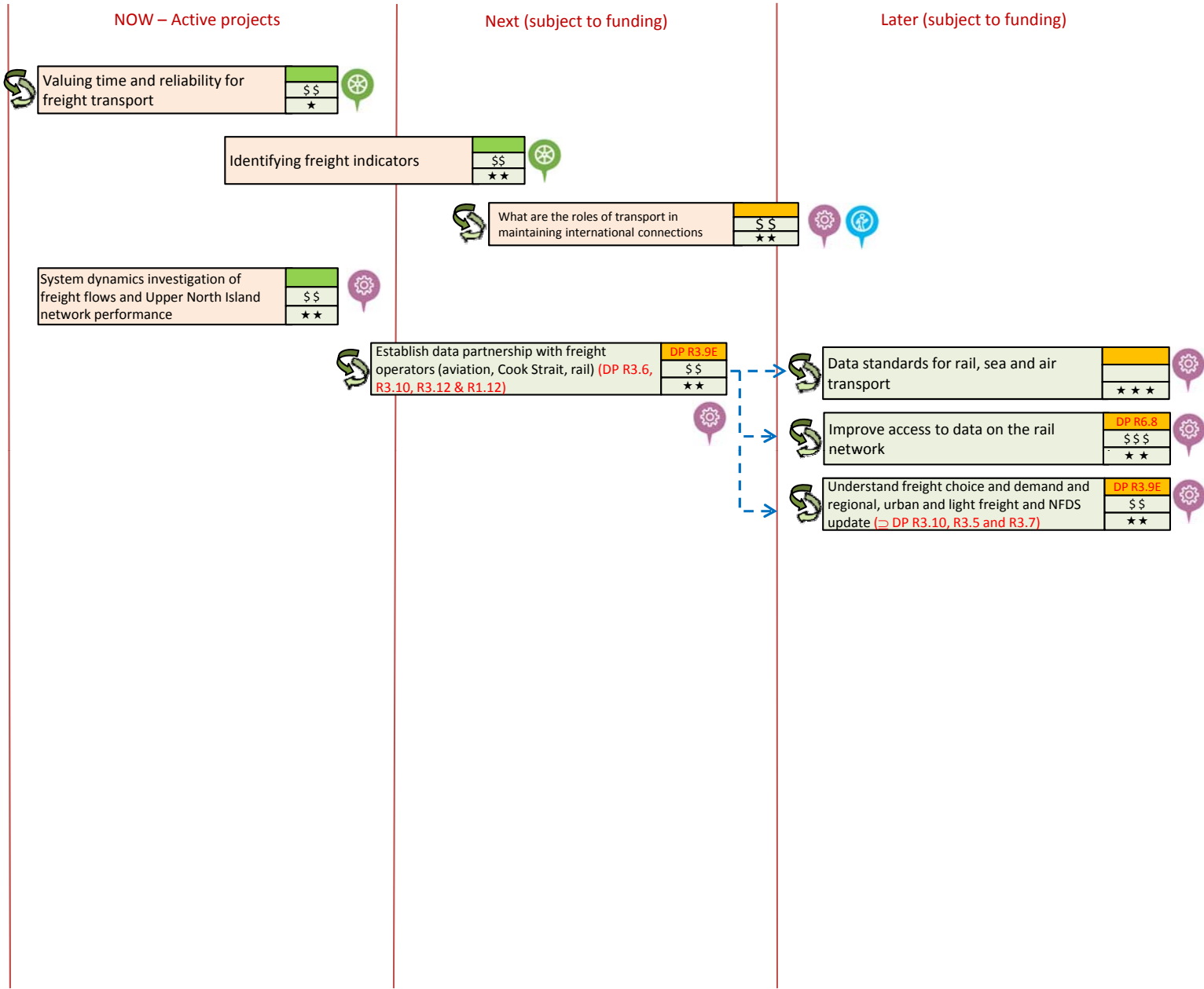
What opportunities and challenges, advantages, and disadvantages does New Zealand have being far away from international markets?

What are the roles of transport?

How are these changing (eg bigger ships) and can we manage changes through transport-related interventions?

Links to other strategic challenges

SC5



- Key:**
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- Knowledge themes**
- User behaviour and needs
 - Transport impacts
 - System planning and management
 - Future funding and charging



1.

2.

3.

Read this supporting document in conjunction with:

1. **New Zealand Transport Domain Plan**

An online PDF is available at:

www.transport.govt.nz/transport-domain-plan.pdf

2. **Full List of Recommendations**

An online PDF is available at:

<http://www.transport.govt.nz/legacyfileredirect/full-list-recommendations.pdf>

3. **New Zealand Transport Research Strategy**

An online PDF is available at:

www.transport.govt.nz/transport-research-strategy.pdf



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