



# Petone to Grenada Link Road Re-evaluation 2018

## Summary Report (Report 3)

Prepared for  
NZ Transport Agency



## Contact Information

Cardno (NZ) Limited  
Company No: 36749 / GST: 42-019-690

Level 5, IBM Building  
25 Victoria Street  
Petone Lower Hutt 5012  
New Zealand

www.cardno.com  
Phone +64 4 478 0342

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## Author(s)

s 9(2)(a)	Project Director	Effective Date	10 December 2018
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## Approved By

Adam Nicolls	Date Approved
Principal Transport Planner, NZ Transport Agency	

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# 1 Executive Summary

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## 1.1 Background

In mid-2018, the NZ Transport Agency announced the Petone to Grenada (**P2G**) Link Road project would be re-evaluated to assess its alignment with the strategic objectives of the Government Policy Statement on Land Transport Funding 2018-27 (**GPS 2018**). This re-evaluation decision followed the Transport Agency's previous decision in December 2017 to reconsider the project based on the recommendations of the 2017 P2G Link Road Evaluation Report.

The re-evaluation process commenced in August 2018 following release of the Transport Agency Investment Programme (**TAIP**) Re-evaluation Guidelines (July 2018). At the same time, review processes were already underway to respond to the key recommendations of the 2017 P2G Link Road Evaluation Report.

The re-evaluation process from August 2018 was undertaken in two parts:

- > Strategic context review (Report 1) – this review examined the P2G Link Road's problems, benefits, objectives, and key supporting strategic documents in light of GPS 2018. It also identified new (draft) problem and benefit statements and investment objectives and a "stage 1" uncertainty log (with a "stage 2" uncertainty log identified in Report 2).
- > Options/alternatives assessment (Report 2) – this assessment examined the east-west connectivity options for responding to the new problem and benefit statements and investment objectives identified in Report 1.

Report 3 summarises the key findings of the above processes (as documented in Reports 1 and 2).

## 1.2 Strategic context review

The methodology adopted for the strategic context review was predicated on the Transport Agency's Investment Programme (**TAIP**) re-evaluation guidelines (July 2018), its programme business case (**PBC**) guidance material, and took into account the key recommendations from the 2017 P2G Link Road Evaluation Report. The approach taken was also cognisant of the fact that investigations for the P2G Link Road had been based on the Transport Agency's former Scheme Assessment Report (**SAR**) processes, rather than its current business case development practices.

Given the P2G Link Road investigations were undertaken via SAR processes, the strategic context review focused on reviewing the information provided in the 2014 P2G Link Road Scoping Report (the **2014 Scoping Report**) – which was the first phase of the SAR process for the project. As such, the 2014 Scoping Report was considered to be the P2G Link Road's key "strategic context report" for the purposes of the review.

The strategic context review, as well as the option/alternative assessment process, took a broad view of east-west transport connectivity within the wider Ngauranga Triangle transport system context. This system is the strategic transport network that operates between Lower Hutt (in the east) and the Porirua/Tawa/Johnsonville area (in the west), and comprises State Highways 1, 2 and 58 as well as Hutt Valley/Melling and Kāpiti/Johnsonville Rail Lines.

### 1.2.1 Problem statement review

The problem statements identified in the 2014 Scoping Report, which were based on the statements previously developed for the procurement of the SAR in 2012, were assessed against GPS 2018 strategic objectives. In addition, the two sets of project objectives developed for the P2G Link Road project (referred to as 2014 Project Objectives and the Updated 2014 Project Objectives) were assessed through a "problem lens" (as well as through an "objectives lens"). Furthermore, and in order to reflect the strategic direction of GPS 2018 and the recommendations of the 2017 P2G Link Road Report, new draft problem statements



were developed based on a series of council officer workshops held during 2018.<sup>1</sup> A review of the key programme context changes and the evidence base for the new problem statements was also undertaken.

In summary, three of the four original problem statements identified in the 2014 Scoping Report (i.e. inefficient freight routes, resilience redundancy and low public transport utilisation) are considered to be matters that the strategic priorities of GPS 2018 are seeking to address. The fourth problem statement, relating to addressing growth/development restrictions through road capacity, was considered to be less aligned with the strategic direction of GPS 2018. It was noted that no safety specific problem statement was identified in the 2014 Scoping Report, and environmental and value for money factors were assessed in the multi-criteria analysis (**MCA**) processes that followed completion of the 2014 Scoping Report.

When considering the two sets of project objectives developed for the P2G Link Road project, through a “problem statement lens”, the majority of the objectives (i.e. improve resilience redundancy, east-west connectivity, safety and environment) are matters that the GPS 2018 strategic objectives for safety, access and environment are seeking to address. However, the Updated 2014 Project Objectives that seek to specifically reduce travel times on the state highway network, and to build a new road to an expressway standard, are considered to be less aligned with the strategic objectives of GPS 2018.

### 1.2.2 Programme context changes

The key programme context changes that have occurred since completion of the 2014 Scoping Report include: a regional population increase of 15,000 between Census 2006 and 2013 (population is expected to increase by another 77,000 by 2043); a small regional employment increase between the two Censuses (although employment is predicted to increase by 38,000 by 2043); increase in the populations of the “directly connected” cities (e.g. Wellington City), and in some cases, previous population predictions have already been exceeded (e.g. Lower Hutt City); and, the continuation of the development of key residential and employment growth areas (e.g. Lincolnshire Farm, Upper Stebbings Valley, and Petone West).

In September 2018, Wellington City Council (**WCC**) announced that the Lincolnshire Farm area had potential for further intensification (e.g. the area could accommodate up to 10,000 dwellings<sup>2</sup>), and offered to partner with the Government to help build the P2G Link Road in order to facilitate improved access to Lincolnshire Farm.

### 1.2.3 New draft problem statements

Two new draft problem statements were developed for the re-evaluation, accounting for the new direction of GPS 2018 and the 2017 P2G Link Road Evaluation Report. Both problem statements, and their supporting evidence base, is summarised as follows:

***Problem 1: Wellington’s east-west transport network lacks resilience to natural disasters and regular interruptions, which can cause major economic and social disruption (weighting 60%)***

- > There is a 30% chance of a damaging earthquake occurring in the Wellington Region every 10 years.
- > A major natural disaster could cost the region more than \$16B, with recent Low Impact Low Probability (**LIHP**) events having caused damages that run into the millions (e.g. the 2013 storm, which washed out the Hutt Valley Rail Line for one week, had an estimated cost of up to \$43M).
- > The draft Wellington Resilience PBC has identified the most vulnerable sections of the Wellington Region transport system to include: the SH2 (Ngauranga to Petone) and SH1 (Ngauranga Gorge) multi-modal transport corridors and SH58 (east). All of these corridors are located within the Ngauranga Triangle transport system.
- > The outage time predicted for SH1 and SH2, following a damaging High Impact Low Probability (**HILP**) event, could be up to 12 months. Such an outcome could potentially leave a number of communities isolated for long periods of time (particularly Lower Hutt City).

<sup>1</sup> It is noted that the new problem statements (as well as the new benefit statements and investment objectives) have not been formally endorsed by the Transport Agency or the local councils

<sup>2</sup> The approved structure plan allows up to 900 dwellings and 45 hectares of employment land to be developed

- > There are a number of critical lifeline utilities that are reliant on the Ngauranga Triangle transport system operating for response and recovery purposes (e.g. Wellington City's bulk water supply is located within SH2 [Ngauranga and Petone]).

Report 1 identified that there was sufficient evidence to warrant further investigating the Ngauranga Triangle transport system's vulnerabilities to both HILP and LIHP events.

**Problem 2: Existing east-west transport routes limit modal options, safety and direct connections between adjacent communities, curbs economic growth and social interaction (weighting 40%)**

- > Nearly 100% of the 35,000 east-west daily trips undertaken today are via private car or heavy vehicle.
- > There are no direct east-west public transport connections. As a consequence, all east-west public transport trips take longer to make compared to private car trips (e.g. a bus trip can take between 60 and 90 minutes whereas a car trip only takes between 15 and 30 minutes). It is also noted that all public transport trips are required to detour via Wellington Railway Station in the first instance.
- > The combination of the need to move east-west freight over short distances (i.e. 20km or less) with the requirement to detour via the Wellington Railway Station suggests that transferring road freight to rail is not likely to be an attractive proposition from a commercial "just-in-time" perspective.
- > There are no direct east-west cycling and walking connections. The distance and topography between key east-west destinations are likely to be deterrents for increasing the uptake of these modes. However, for those that do walk and cycle, there are a number of "hot spots" in the Ngauranga Triangle transport system that are problematic.
- > It is predicted that there will be nearly 44,000 east-west transport trips made daily by 2036 (an increase of 9,000 trips from today). Given the limited east-west travel choices available, it is likely that these movements will continue to be primarily made via private car or heavy vehicle into the future. The lack of travel choice also potentially limits the opportunities or options for reducing east-west transport costs for those that travel between the east and the west (it is noted that such cost reductions have yet to be quantified).
- > There has been a number of crashes on SH2 (between Ngauranga and Petone), on SH1 (in the Ngauranga Gorge) as well as on SH58 over the past 5 years. For SH58, the construction of the SH58 Safety Improvements Project in 2019 should result in significant safety improvements. Cycling and pedestrian safety on SH2 (between Ngauranga and Melling) should also improve with completion of the Wellington to Hutt Valley (W2HV) Link Project.

Report 1 identified that there was sufficient evidence to warrant further investigating the economic and social impacts (including safety impacts) of Problem Statement 2.

Overall, the new problem statements developed for the re-evaluation align with the safety and access strategic priorities of GPS 2018.

#### 1.2.4 Strategic document review

A number of strategic documents have been published since completion of the 2014 Scoping Report.

At a national level, the key strategic document change has been the change in the GPS's transport investment priorities following approval of a new GPS in June 2018. The investment focus of GPS 2018 is on safety, access, environment, and value for money (whereas GPS 2015's strategic priorities were economic development, productivity and efficiency). Other key strategic document changes at the national level, which are relevant to P2G Link Road and/or east-west travel within the Ngauranga Triangle transport system, have also placed emphasis on improving resilience and increasing travel mode choices.

Similarly, at a regional and local level, new strategic documents (e.g. Wellington Regional Land Transport Plan 2015, and the Wellington Resilience Strategy) have also identified resilience and increasing travel choice as being important. In addition, local council's urban development plans (e.g. Wellington Urban Growth Plan 2014-2043, and Porirua Growth Strategy) have increased their focus on developing residential and employment growth areas to accommodate predicted future population increases.

### 1.2.5 Investment objective review

The 2014 Scoping Report did not identify “business case type” investment objectives for the P2G Link Road, but did identify two sets of project objectives (referred to as the 2014 Project Objectives and the Updated 2014 Project Objectives). The majority of the project objectives (e.g. improve resilience redundancy, east-west connectivity, safety and environment) were found to be aligned with the strategic objectives of GPS 2018. However, the Updated 2014 Project Objectives that specifically sought to reduce journey times on the state highway network, and to build a road to an expressway standard were not considered to be aligned.

It is noted that new investment objectives were developed through the re-evaluation process. New Investment Objective 1 (resilience) reflects the importance that the new strategic context places on resilience, which is also consistent with one of the key recommendations from the 2017 P2G Link Road Evaluation Report (i.e. to increase the importance of the resilience objective). New Investment Objective 2 (increasing travel choice) and Objective 3 (safety) reflect the importance that the new strategic context places on improving east-west connectivity and safety. However, for improving east-west connectivity, the investment focus is on addressing connectivity problems through increased travel choices.

## 1.3 Options/alternatives assessment

Over 100 transport intervention options for improving east-west connectivity were initially considered during the first phase of the option/alternative assessment process. This long list of options was reduced to 40 through an “initial screening” process (i.e. options that didn’t deliver resilience, modal choice, land use and safety outcomes were eliminated from further consideration).

The final 40 intervention options were “packaged” into 10 “themed programmes”, and subjected to MCA processes. The key MCA assessment criteria included: the new investment objectives, the GPS strategic objectives, implementability, and assessment of effects. Through the MCA process, the 10 programmes were ultimately repackaged into a Base Programme and two alternative “major works” programmes for further assessment.

The Base Programme, which is a programme that could be implemented in support of either Programme A or B, comprises of intervention options, such as, travel demand measures, intelligent transport system options, public transport initiatives and minor resilience improvements to the state highway. For avoidance of doubt, the Base Programme, on its own, is not considered to fully deliver the outcomes sought, and requires the further infrastructure investment of either Programme A or B.

The two major works programmes (to be supported by the Base Programme) are:

- > Programme A - widening SH2 (Ngauranga to Petone) through reclamation, major improvements to SH1’s “Johnsonville Bypass” (including consideration of tunnelling options), east-west connectivity improvements at the Ngauranga Interchange, and resilience improvements to SH58 (Haywards) and SH2 (north of the Kennedy Good Bridge Interchange).
- > Programme B - a new “smart connection” link between Petone and Grenada (connecting in with the Lincolnshire Farm development) plus minor resilience improvements to the Ngauranga Gorge. This latter option also assumes the W2HV Link Project would proceed.

**Table 1** identifies the alignment of each programme against the new investment objectives (noting that the Base Programme is complementary to either Programme A or B):



**Table 1 Programme alignment with investment objectives**

Investment Objectives		Base Programme	Option A	Option B
Resilience (70%)	High Impact Low Probability (HILP)	Low	High	Medium
	Low Impact High Probability (LIHP)	Medium	Medium	Medium
Access (20%)	Active Modes	Medium	Medium	Medium
	Passenger Transport	Medium	Low	Medium
	Private Vehicles	Low	Medium	High
Safety (10%)	Active Modes	Medium	Medium	Medium
	Private Vehicles	Low	Low	Medium
Other Considerations		Base Programme	Option A	Option B
Supporting growth in the Ngauranga Triangle Area	Residential and Business	Medium	Low	High
Staging		Medium	Medium	Medium

Report 2 identified high level rough order cost estimates for each of the programmes.

- > Base Programme (Transport Agency only) - \$250M to \$750M
- > Programme A - \$750M to \$2.2B
- > Programme B - \$900M to \$1.8B

The above costs estimates are indicative only, and are strictly for the purposes of helping decision making on the next business case steps to be undertaken.

Report 2 recommended that further stakeholder engagement and technical refinement be undertaken on the options identified in the Base Programme, and in Programme A and B, before a preferred programme (or package) is identified.

#### 1.4 Investment assessment framework (IAF) assessment – results alignment

An indicative Results Alignment profile, for the combined Base Programme and Programme A and B, is assessed to be **High** for the following reasons:

- > addresses safety issues presenting a high societal consequence risk
- > addresses significant resilience gap or impediment to access on nationally important social and economic connections
- > supports high priority elements in agreed integrated land use and multi-modal plans
- > addresses significant gap in access to new housing in high growth urban areas
- > makes best use of key corridors that prioritise multi-modal use and freight, and
- > provides significant operational efficiencies to reduce the costs of meeting appropriate levels of service without impacting benefits.

For avoidance of doubt, a benefit cost ratio(s) for the combined Base Programme and Programme A and B has not been calculated.

## 1.5 Conclusions and recommended next steps

Report 1 identified that three of the four original problem statements (i.e. identified in the 2014 Scoping Report), and the majority of the objectives in the two sets of project objectives developed for the P2G Link Road align with outcomes sought by GPS 2018.

Report 1 also found that there was sufficient evidence to warrant further investigating the “new” resilience and east-west connectivity/safety problem statements as well as the new investment objectives developed during 2018.

In order to respond to the new problem statements, and the investment objectives, Report 2 identified a Base Programme as well as two “major works” programmes for further consideration. It ultimately recommended that further stakeholder engagement and technical refinement be undertaken on the options that make up the programmes before identifying a preferred programme. The key matters requiring further stakeholder engagement include:

- > confirming the level of support for the new problem statements and investment objectives
- > obtaining an improved understanding of local council commitments to the Base Programme initiatives, including funding options, and
- > obtaining feedback on the various intervention options that make up Programme A and B, including form and function of the new smart connections link; funding options for the smart connection link (e.g. WCC Lincolnshire Farm partnership offer); timing for implementation of the intervention options, and the value placed on resilience level-of-service as well as on improving east-west travel choice.

Further technical refinement is required on the intervention options identified in the programmes, and in particular the SH2 (Ngauranga to Petone) reclamation and the Johnsonville Bypass major improvement options.

### 1.5.1 Business case development options

The following two business case development options have been identified as potential “next steps”:

- > Option 1 involves completing a PBC, which would then be followed by a single stage business case(s). This option is likely to take 12 to 18 months to complete (i.e. mid 2020), and would include wider public engagement processes. This option would also involve implementing “quick wins” (e.g. minor resilience improvements) by mid-2019.
- > Option 2 involves combining the remaining “PBC type activities” into a single stage business case (including implementing “quick wins” by mid-2019). This option is likely to take 12 months to complete. A key assumption underpinning the timeframes for this option, is the assumption that the previous technical work undertaken for the P2G Link Road would be largely “re-used” for development of the smart connections link option.

For avoidance of doubt, the consenting, detailed design, property acquisition and construction phases for the preferred programme would be undertaken following the completion of either business case option.

Key issues requiring further consideration when assessing the business case development options include (but not necessarily limited to):

- > stakeholder/property owner uncertainty created by the recommendation to undertake further business case work
- > potential for stakeholders to be “surprised” by some of the new options identified for further assessment, and
- > possible uncertainty/confusion created for W2HV Link Project’s resource consent process (due to SH2 reclamation “being on the table”). It is noted that the necessary resource consent applications for this project are expected to be lodged in late 2019.

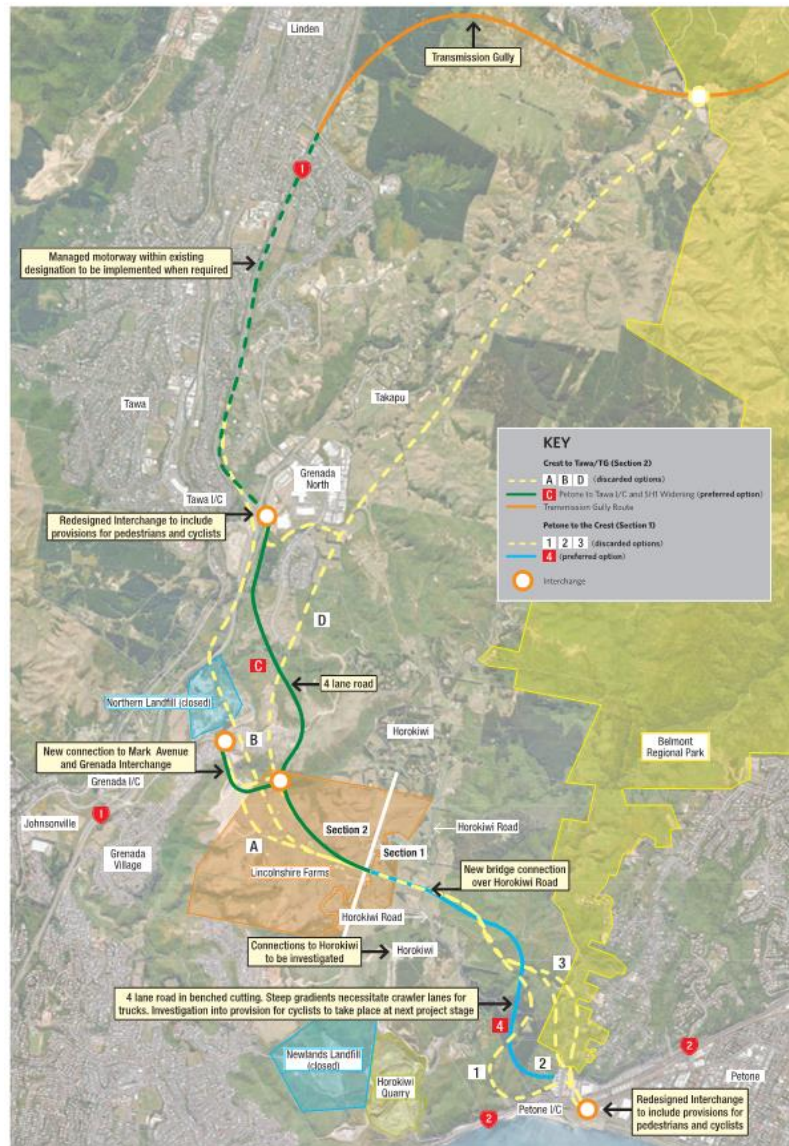
## 2 Strategic Context Review

Report 1 documents the strategic context review. This report examined the P2G Link Road’s problems, benefits, objectives, and key supporting strategic documents in light of GPS 2018. It also identified new draft problem and benefit statements and investment objectives and a “stage 1” uncertainty log (with a “stage 2” uncertainty log identified in Report 2). This section summarises the key steps and findings of Report 1.

### 2.1 Proposed P2G Link Road

A road linking Petone and Grenada has been under investigation for a number of years. It was first seriously considered in 1975, and then again during the late 80s and mid-90s. The Transport Agency commenced detailed investigations into the P2G Link Road in 2013. The investigations followed a scheme assessment report (SAR) investigation process, rather than the business case process for project development. In April 2014, the scoping phase of the SAR was completed, which identified the strategic context and a shortlist of alignment options. Following stakeholder/public engagement on the options, and multi-criteria analysis (MCA) processes, a preferred alignment option was announced in November 2015 as set out below in Figure 1.

Figure 1 P2G Link Road (as announced in November 2015)





Further design refinements were undertaken during 2016. By the end of 2016, detailed designs for the preferred interchanges, along with adjustments to the main alignment had been identified. In mid-2017, the Transport Agency decided that the latest scheme design needed evaluation prior to confirming the next steps for the project. This evaluation was completed in late 2017, and documented in the 2017 P2G Link Road Evaluation Report. This report's key recommendations were as follows:

1. restate the project objectives to be clear that resilience is a priority objective
2. reconsider whether an expressway standard is required to provide the project outcomes
3. take a system-wide transport view including considering active demand management options such as greater public transport usage, high occupancy vehicle lanes, ride sharing schemes, tolling and freight priority
4. reconsider the form of the connection to SH1 on the Grenada side, and
5. reconsider earlier alignment options that might allow a better resilience outcome with lower overall environmental impact.

In December 2017, the Transport Agency announced it would respond to the findings of the report, and would report back on progress in 2018. In mid-2018, the Transport Agency announced that the P2G Link Road would be re-evaluated to assess its alignment with the strategic objectives of GPS 2018.

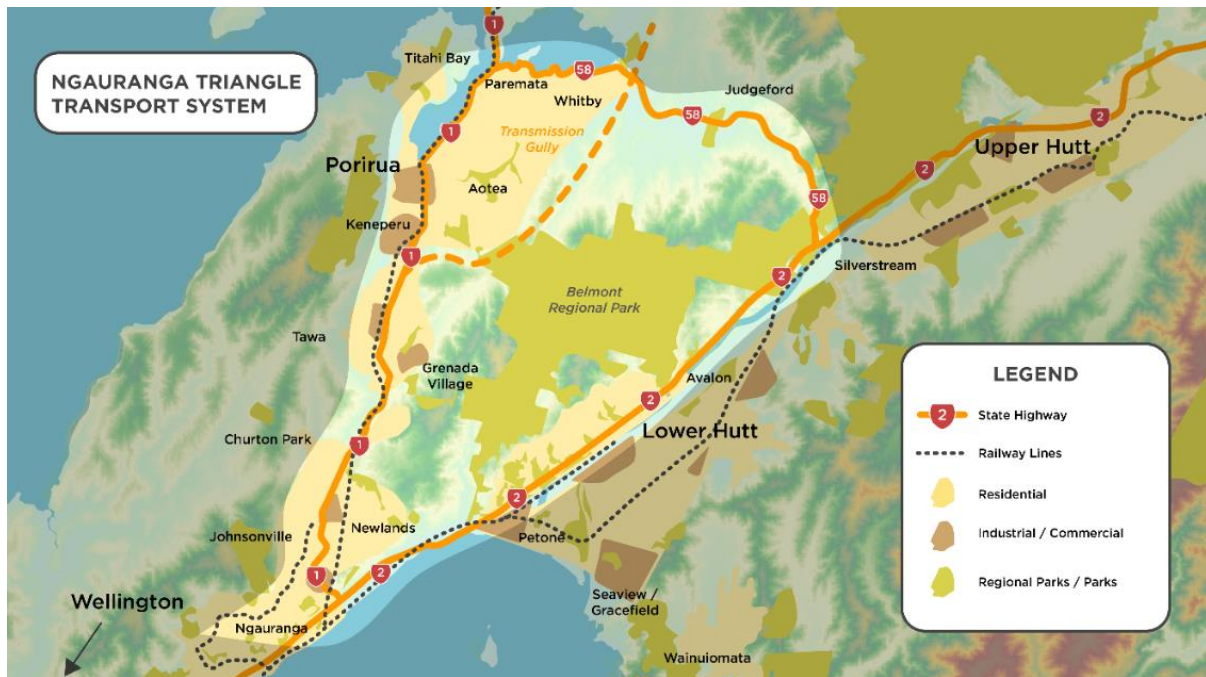
## 2.2 Strategic context review methodology

The methodology adopted for the strategic context review has been predicated on the Transport Agency Investment Programme (**TAIP**) re-evaluation guidelines (July 2018), its programme business case (**PBC**) guidance material, as well as taking into account the key recommendations from the 2017 P2G Link Road Evaluation Report. The approach taken has also been cognisant of the fact that previous investigations for the P2G Link Road were based on the Transport Agency's former SAR processes, rather than following its current business case development practices.

Given the investigation history for the P2G Link Road, the strategic context review has focused on reviewing the information provided in the 2014 P2G Link Road Scoping Report (the **2014 Scoping Report**) – which was the first phase of the SAR process for the project. The 2014 Scoping Report is considered to be the P2G Link Road's key "strategic context report" for the purposes of this review.

In order to assess the P2G Link Road and alternative east-west transport investment options, the re-evaluation has taken a broad view of east-west transport connectivity within the wider Ngauranga Triangle transport system. As set out in **Figure 2**, this transport system is the strategic transport network that is bound to the east by State Highway 2 (**SH2**) and Hutt and Melling Rail Lines, and State Highway 1 (**SH1**) and the Kāpiti and Johnsonville Rail Lines to the west. To the north, the system is bordered by State Highway (**SH58**), and the Ngauranga Interchange is its southern point. Connectivity to Upper Hutt has also been considered as part of the Ngauranga Triangle transport system.

Figure 2 Ngauranga Triangle transport system



## 2.3 Problem statement review

### 2.3.1 Assessing the existing problem statements

The problem statements identified in the 2014 Scoping Report were based on the statements previously developed for the procurement of the SAR in 2012, and therefore weren't developed or assessed through the Transport Agency's current business case processes. It is also noted that business case benefit statements and investment objectives weren't developed for the P2G Link Road.

Given the "development history" of the problem statements, the strategic context review assessed the problem statements identified in the 2014 Scoping Report against the strategic objectives of GPS 2018. To support this assessment process, the problems identified in key regional land transport strategies/plans developed during the 2000s as well as in the 2009 Ngauranga Triangle Strategic Study (**2009 Transport Strategic Study**) were also reviewed for background purposes.

In addition, the two sets of project objectives developed for the P2G Link Road project (referred to as 2014 Project Objectives and the Updated 2014 Project Objectives) were assessed through a "problem lens" (as well as through an "objectives lens"). Furthermore, and in order to reflect the strategic direction of GPS 2018 and the recommendations of the 2017 P2G Link Road Report, new draft problem statements were developed based on a series of council officer workshops (including an investment logic mapping (ILM) workshop) held during 2018 (see **Appendix A** for the ILM map, and **Appendix B** for the investment objectives).<sup>3</sup> A review of the key programme context changes and the evidence base for the new problem statements was also undertaken in Report 1.

<sup>3</sup> It is noted that the new problem statements (as well as the new benefit statements and investment objectives) have not been formally endorsed by the Transport Agency or the local councils



### 2.3.2 Problems identified in historical regional transport plans/strategies and 2009 Strategic Transport Study

The problems and/or transport issues identified in the regional transport strategies/plans that were developed during 2000s placed emphasis on travel variability/congestion problems on SH1 and SH2, the lack of transport redundancy, and the need to provide access to new development areas. The latter two problems/issues are matters that the GPS 2018 strategic objectives of safety and access are seeking to address. In terms of the environmental and value for money objectives, these were considered generically within these documents (rather than specifically for east-west connectivity).

The 2009 Strategic Transport Study identified that there was a lack of east-west transport connectivity (affecting social and economic integration), poor east-west freight connectivity (e.g. Seaview-Gracefield to lower North Island), and limited east-west passenger transport service opportunities. These problems are matters that the GPS 2018 strategic objectives for safety and access are seeking to address. This study also included consideration of environmental objectives and the benefit cost ratio (BCR) calculation (as a proxy for value for money). These considerations align with GPS 2018's environmental and value for money goals.

### 2.3.3 2014 Scoping Report's Problem Statements

The strategic context review's assessment of the 2014 Scoping Report's problem statements against GPS 2018 strategic objectives is summarised below in **Table 2**:

**Table 2 2014 Problem statement assessment against GPS 2018 strategic objectives**

2014 Problem Statement (PS)	GPS 2018 Strategic Objectives			
	Safety	Access	Environment	Value for Money
<b>PS1 – Economic: Limited capacity of the current road network contributes to congestion and restricts growth and development</b>	N/A	Maybe	N/A	N/A
<b>PS2 – Economic: Inefficient routes cause freight to be carried over longer distances</b>	N/A	Yes	N/A	N/A
<b>PS3 – Resilience: Any disruption to existing routes risks isolating Wellington from its neighbouring communities and restricts State Highway access north</b>	N/A	Yes	N/A	N/A
<b>PS4 – Utilisation: Current network precludes efficient public transport links between areas of common interest e.g. Hutt Valley and Porirua.</b>	N/A	Yes	N/A	N/A

The matters identified in Problem Statements 2, 3 and 4 (i.e. inefficient freight routes, resilience and utilisation) are aligned with the strategic priorities of GPS 2018. Problem Statement 1 has been assessed as a "Maybe" as, although addressing growth/development restrictions is a matter GPS 2018 seeks to address, the statement's focus on addressing restrictions through road capacity is considered to be less aligned. It is noted that no specific problem statement was identified for safety, and environmental and value for money factors were assessed in the MCA processes that followed completion of the 2014 Scoping Report.

As the P2G Link Road was developed under the SAR process, it is important to appreciate that its design was mostly driven by the project objectives developed for the 2014 Scoping Report, rather than from a business case problem statement or investment objective perspective (in terms of the latter, none were developed). As such, the strategic context review assessed the project objectives developed for P2G Link Road through a "problem lens" as well as through an "objectives lens".

Two sets of project objectives were developed – 2014 Project Objectives which were identified in the 2014 Scoping Report, and the Updated 2014 Project Objectives. The latter set were developed in late 2014 for the MCA processes (used in 2015) to identify the preferred alignment for the P2G Link Road.

**Table 3** sets out a high level summary of the two sets of project objectives developed for the P2G Link Road, and an assessment of them against GPS 2018 strategic objectives from a problem statement perspective.

**Table 3 “Problem Statement assessment” of the 2014 and Updated 2014 Project Objectives**

2014 Project Objectives	GPS Strategic Objectives			
	Safety	Access	Environment	Value for Money
Improve safety and efficiency of the transport network including efficiency of HCVs <sup>4</sup> travelling between Seaview and SH1 to the north and maximise value for money	Yes	Yes	N/A	N/A
Support the economic growth and development of the region by improving connectivity within the region	N/A	Yes	N/A	N/A
Enhance resilience of the State Highway network within the region	N/A	Yes	N/A	N/A
Minimise adverse environmental impacts	N/A	N/A	Yes	N/A
Updated 2014 Project Objectives				
Enhance local, regional, and national economic growth and productivity for people and freight	N/A	Yes	N/A	N/A
Improve connectivity between the lower Hutt Valley and Johnsonville and Porirua	N/A	Yes	N/A	N/A
Reduce journey times and improve journey time reliability between the lower Hutt Valley, Ngauranga and Porirua, and on the Wellington state highway network	N/A	No	N/A	N/A
Enhance safety of travel on the Wellington state highway network	Yes	N/A	N/A	N/A
Enhance resilience of the Wellington state highway network	N/A	Yes	N/A	N/A
Manage the immediate and long term social, cultural, land use, and other environmental impacts of the project on the Wellington region and its communities by (so far as practicable) avoiding, remedying or mitigating any such effects through route and alignment selection, expressway design and conditions	N/A	N/A	Maybe	N/A
By developing and constructing a cost efficient new road alignment to expressway standards between SH2 in the lower Hutt Valley and SH1 north of Ngauranga.	N/A	No	No	N/A

<sup>4</sup> Heavy commercial vehicles



When collectively considering the two sets of project objectives above, and through a “problem statement lens”, the objectives that seek to improve resilience, east-west connectivity and safety of the transport network, align with the GPS 2018 strategic priorities for safety and access. The environmental project objectives (as identified in the Updated 2014 Project Objectives) also broadly align with environmental goals of GPS 2018, although the environmental project objectives have been assessed as a “Maybe”, as they specifically relate to construction of an expressway. However, the Updated 2014 Project Objectives that seek to specifically reduce travel times on the state highway network, and to build a new road to an expressway standard, are considered to be less aligned with the strategic objectives of GPS 2018 (and therefore have been marked “No”).

### 2.3.4 Summary – existing problem statements alignment with GPS 2018

In summary, three of the four original problem statements identified in the 2014 Scoping Report (i.e. inefficient freight routes, resilience redundancy and low public transport utilisation) are considered to be matters that the strategic priorities of GPS seek to address. The fourth problem statement, relating to addressing growth/development restrictions through road capacity, was considered to be less aligned with the strategic direction of GPS 2018. It was noted that no safety specific problem statement was identified in the 2014 Scoping Report, and environmental and value for money factors were assessed in the MCA processes that followed completion of the 2014 Scoping Report.

When considering the two sets of project objectives developed for the 2014 Scoping Report and for the subsequent MCA (undertaken in 2015), through a “problem statement lens”, the majority of the objectives (i.e. improve resilience redundancy, east-west connectivity, safety and environment) are matters that the GPS 2018 strategic objectives for safety, access and environment are seeking to address. However, the Updated 2014 Project Objectives that seek to specifically reduce travel times on the state highway network, and to build a new road to an expressway standard, are considered to be less aligned with the strategic objectives of GPS 2018.

## 2.4 Programme context changes and 2018 problem statements

Two new east-west connectivity problem statements were identified through a series of workshops held with council officers in 2018. These workshops commenced in March 2018 following the release of the 2017 P2G Link Road Evaluation Report.

Prior to assessing the “2018 problem statements”, the key changes to the “programme context” following completion of the 2014 Scoping Report were identified as set out below.

### 2.4.1 Key programme context changes

The key programme context changes are as follows:

- > Wellington Region’s population grew by 15,000 between Census 2006 (456,000) and Census 2013 (471,000).<sup>5</sup> Regional population is expected to increase by another 77,000 by 2043 (or 548,000).
- > By 2043, Wellington City’s population is predicted to have increased by 55,000, Lower Hutt City’s by 5,000, Porirua City’s by 7,000 and Upper Hutt City’s by 3,200. Lower Hutt City’s current population has already exceeded its 2043 population prediction.
- > There was a small increase in regional employment between Census 2006 and 2013. Regional employment is however predicted to grow by 38,000 by 2043, with an extra 3,600 people to be employed in the Lower Hutt, Porirua, and Upper Hutt areas.
- > Based on Census 2013, job movements between the east and the west were as follows:
  - approximately 8% (or 2,800) of the 35,500 jobs located in Lower Hutt City were filled by workers from the Porirua/Tawa/Johnsonville area, with the majority of job destinations in Petone/Seaview and central Lower Hutt

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<sup>5</sup> It is noted that the 2014 Scoping Report’s population forecasts were based on Census 2006 information

- approximately 6% (or 1,300) of the 21,100 jobs located in the Porirua/Tawa/Johnsonville area were filled by workers from the Lower Hutt area. Job destinations were evenly spread through this area, and
  - of the 9,900 jobs located in Upper Hutt City, approximately 4% (or 400) were filled by workers from the Porirua/Tawa/Johnsonville area, and of the 21,100 jobs located in the Porirua/Tawa/Johnsonville area, approximately 3% (or 650) were filled by workers from the Upper Hutt area. Job destinations are evenly spread through both areas.
- > Notable land developments and/or proposals in the Ngauranga Triangle area that have been advanced since 2014 include: Lincolnshire Farm (which has been identified by Wellington City Council [WCC] for further intensification<sup>6</sup>), Upper Stebbings Valley<sup>7</sup>, Petone West (especially “big box” retail)<sup>8</sup> and Kenepuru Landings (Porirua south)<sup>9</sup>.
- > On SH58, the SH2/SH58 Interchange was grade separated in 2016 (this project included upgrades to park and ride facilities at Manor Park), and the speed limit was reduced from 100km/h to 80km/h in September 2018. Traffic volumes on SH58 are predicted to increase from 15,000 vehicles per day (vpd) currently to 21,000 vpd by 2036. The section of SH58 east of the Plimmerton roundabout (on SH1) to the Transmission Gully motorway’s future SH58 Interchange is expected to be revoked, and a major safety upgrade of SH58 east of this future interchange to SH2 is due to start in 2019.
- > On SH1, Transmission Gully motorway is due to be operational from 2020, with the section of SH1 north of the future Kenepuru Interchange near Linden (to Plimmerton) to be revoked. North-south traffic volumes are predicted to increase from 74,000 vpd (today) to 91,000 vpd by 2036 in the Ngauranga Gorge.
- > On SH2, key proposed improvements include: improvements to the Melling Interchange as part of the RiverLink Project, and provision of separated cycling and pedestrian facilities between Ngauranga and Melling. North-south traffic volumes are expected to grow from 69,000 vpd (today) to 81,000 vpd by 2036 between Ngauranga and Petone.
- > To the south of the Ngauranga Triangle transport system there are a number of transport improvements proposed for Wellington City over the next 10 years, with the most significant being the Let’s Get Wellington Moving (LGWM) project.

As was identified in the 2014 Scoping Report, there still remains no direct east-west rail or bus commuter services (i.e. commuters are required to transfer at the Wellington Railway Station in the first instance). In addition, there have been no material changes in the geographic/environmental context for the Ngauranga Triangle since completion of the 2014 Scoping Report.

For completeness, about 20,000 vpd travel east/west on the SH1/SH2 route, which is predicted to increase to 23,000 vpd by 2036.

<sup>6</sup> See - <https://www.stuff.co.nz/dominion-post/news/107144952/government-asked-to-support-building-ecocity-and-use-kiwi-build-funds-for-capitals-housing-solution>

<sup>7</sup> See - <https://wellington.govt.nz/your-council/projects/proposed-upper-stebbing-valley-community>

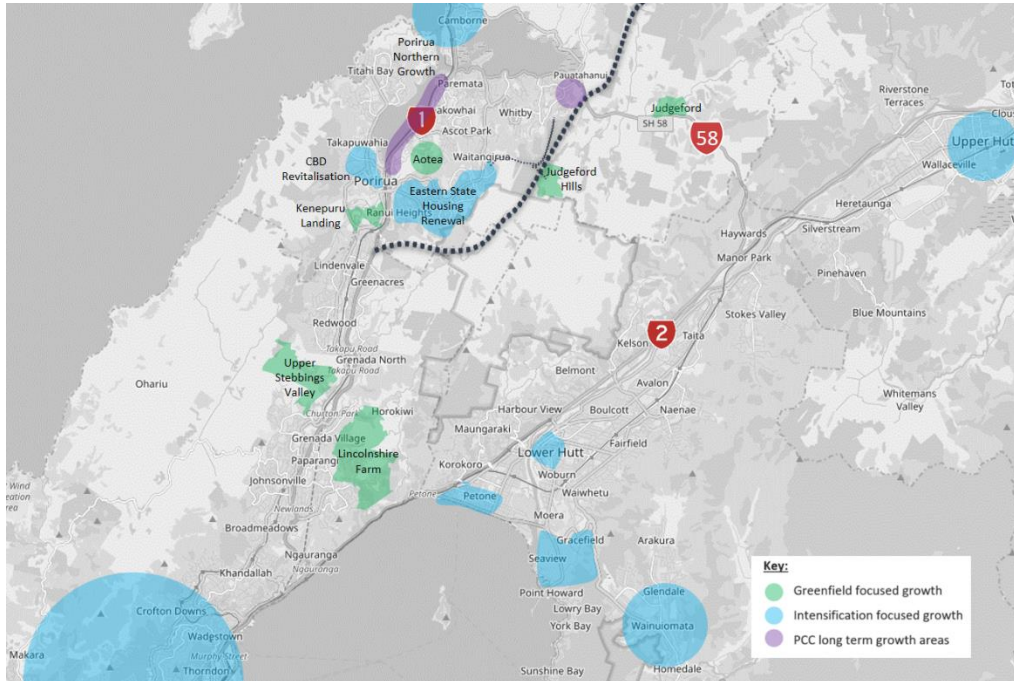
<sup>8</sup> See - <http://www.huttcity.govt.nz/Your-Council/Plans-publications-and-bylaws/District-Plan/District-Plan-changes/District-Plan-change-29/>

<sup>9</sup> <https://www.kenepurulanding.co.nz/>

2.4.1.1 Summary of key residential and employment growth areas

Figure 3 sets out the key residential and employment growth areas in the Ngauranga Triangle area.

Figure 3 Key growth areas in the Ngauranga Triangle area



2.4.2 Assessment of the new problem statements

New draft problem statements for east-west transport connectivity within the Ngauranga Triangle were developed for the re-evaluation process, and in particular for the option/alternative assessment processes undertaken for Report 2.

The assessment of the evidence base that supports both draft problem statements is summarised below.

**Problem 1: Wellington’s east –west transport network lacks resilience to natural disasters and regular interruptions, which can cause major economic and social disruption (weighting 60%)**

The Ngauranga Triangle transport system faces a unique set of resilience risks that makes it highly vulnerable to High Impact Low Probability (HILP) events and Low Impact High Probability (LIHP)<sup>10</sup> events, as follows:

- > Key sections of the transport system, are located within or near terrain that makes it vulnerable to a range of HILP and LIHP events. The draft Lifelines Resilience PBC 2018<sup>11</sup> suggests that, on average, there is about a 30%<sup>12</sup> chance of a damaging earthquake occurring every decade. If such an event was to occur on the Wellington Fault-line, which has a recurrence interval of 1,100 years, the estimated outage time for SH1 (Ngauranga Gorge) and SH2 (between Ngauranga and Petone), is between 6 and 12 months.<sup>13</sup>
- > The transport system has a low level of redundancy. In particular, SH2 between Ngauranga and Petone, has no alternative routes if it is closed (including local road networks). It has been identified by the draft

<sup>10</sup> For example, slips from storm events, flooding, unplanned outages (e.g. traffic accidents)

<sup>11</sup> It is noted the draft Wellington Lifelines, Projecting Wellington’s economy through accelerated infrastructure investment programme business case (2018) is not yet publicly available

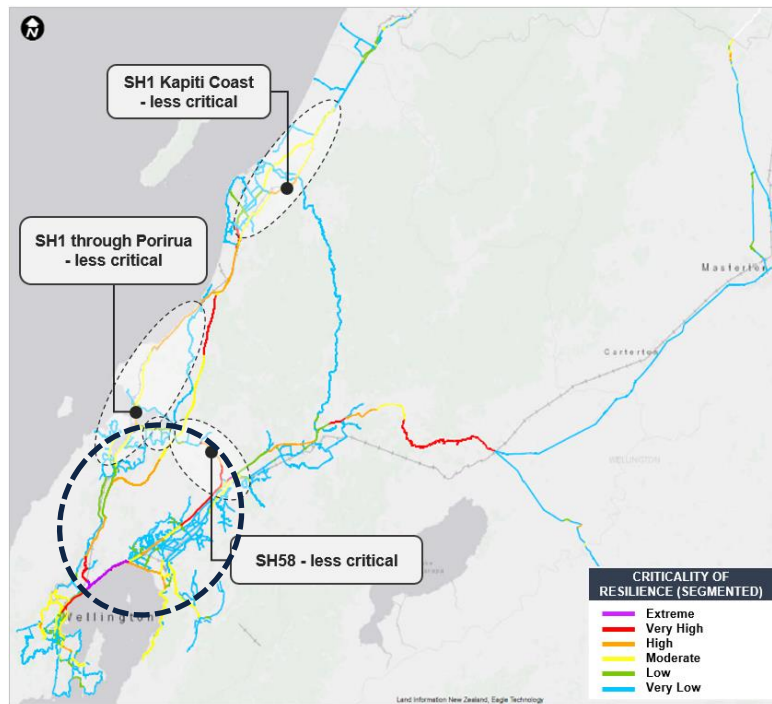
<sup>12</sup> Wellington Lifelines, Projecting Wellington’s economy through accelerated infrastructure investment programme business case, 2018, Page v

<sup>13</sup> Wellington Regional Land Transport Resilience PBC, 2018, page 39



Wellington Resilience PBC 2018<sup>14</sup> as being the most vulnerable section (extreme criticality) of the land transport system in the Wellington Region (see **Figure 4** below), as it is an enabler of various multi-modal functions/connections between Wellington, Hutt Valley and further north. There have been a number of notable occasions when SH2 has been closed (e.g. 2015 Petone Flood), which has forced people to use the alternative SH2 (north), SH58 and SH1 route to travel east-west (or north-south). This is a lengthy detour of nearly 50km between the Lower Hutt and Wellington CBDs, and 28km between the Porirua and Lower Hutt CBDs. The opening of the Transmission Gully motorway is not going to materially change the length of these detours.

**Figure 4 Draft Wellington Resilience PBC’s resilience criticality ratings**



- > The Ngauranga Interchange has also been afforded an extreme ranking in the draft Wellington Resilience PBC 2018, as it is an enabler of multi-modal functions/connections. It is noted that SH1, from the Ngauranga Interchange to north of Johnsonville, is ranked number five in the draft Wellington Resilience PBC 2018’s Risk Register.<sup>15</sup> This makes the entire section of SH1 from the Ngauranga Interchange to Johnsonville problematic from a resilience perspective.
- > The SH2 multi-modal transport corridor, between Ngauranga and Petone, is susceptible to disruption from significant wave action and/or flooding as a consequence of large storm events. Climate change and future sea level rise is likely to further exacerbate these hazards, and cause disruption for the multi-modal functions/connections that use this transport corridor.
- > A major movement on the Wellington Fault-line would leave a number of the Ngauranga Triangle area’s “communities” isolated, and potentially for long periods of time. In particular, Lower Hutt is considered to be highly vulnerable to being isolated for long periods of time. Porirua/Tawa/Johnsonville areas and Wellington City can also expect periods of isolation, however, the Transmission Gully motorway is expected to improve the resilience of these communities.
- > Scenario cost modelling of a damaging HILP event occurring in the Wellington Region runs into the billions of dollars. The draft Wellington Lifelines PBC 2018 predicted economic loss to the national Gross Domestic Product could be in the order of \$16B following a 7.5 magnitude movement on the Wellington

<sup>14</sup> It is noted the draft Wellington Regional Land Transport Resilience PBC (2018) is not yet publicly available

<sup>15</sup> Wellington Regional Land Transport Resilience PBC, 2018, page 35

Fault-line.<sup>16</sup> Although specific economic modelling hasn't been undertaken for an HILP event that damages the transport system, the economic consequences predicted for the Wellington Region suggest that the economic losses from a severely damaged system are likely to be significant.

- > Economic loss scenarios have also been calculated or modelled for LIHP events for the Wellington Region and/or the transport system as well. For example, the Ministry of Transport estimated the economic costs for the one week closure of the Hutt Valley Rail Line (between Ngauranga and Petone) following a storm event in 2013 was between \$12M and \$43M (see **Figure 5** below).<sup>17</sup>

**Figure 5 Wash out of the Hutt Valley Rail Line in 2013**



- > A number of Wellington lifeline utilities are dependent on the transport system, either because they are physically located within the network or require it to be operational for response and recovery purposes. For example, Wellington City's bulk water main supply connection is physically located within SH2.
- > In terms of unplanned outages, the Transport Agency's Traffic Road Event Information System<sup>18</sup> (**TREIS**) shows that there were 69 unplanned events that closed the state highway network for four or more hours between 2008 and 2017. Most of the unplanned outages occurred on SH1 (60%) and SH58 (30%), with 28% of these events being traffic related incidents. It is possible that TREIS hasn't recorded all of the unplanned events relating to traffic accidents. It is also notable that crashes/other incidents that occur around or within peak periods are likely to have significant effects on accessibility even if they do not result in closure of the road.

#### **2.4.2.1 Recommendation**

Report 1 identified that there was sufficient evidence to warrant further investigating the Ngauranga Triangle transport system's vulnerabilities to both HILP and LIHP events. The most vulnerable locations are clustered around the southern section of the Ngauranga Triangle transport system.

**Problem 2: Existing east-west transport routes limit modal options, safety and direct connections between adjacent communities, curbs economic growth and social interaction (weighting 40%)**

East-west transport movements between the Lower Hutt/Upper Hutt and Porirua/Tawa/Johnsonville areas (which have a combined population of about 212,000) are made via the state highway network or via the commuter rail network. In terms of the state highway network, private car, heavy vehicle or bus trips are either made via the combined SH1/SH2 route or SH58 (as there are no local road connections).

<sup>16</sup> Wellington Lifelines, Projecting Wellington's economy through accelerated infrastructure investment programme business case, 2018, Page iv

<sup>17</sup> Wellington Regional Land Transport Plan 2015, page 18

<sup>18</sup> TRIES is the Transport Agency's database that records maintenance, closures and events on the state highway network

Currently, there are about 35,000 east-west transport trips made daily, and almost all of these trips are made via private car or heavy vehicle. Key reasons for why this east-west modal split exists are as follows:

- > The east-west bus trip between Porirua and Lower Hutt currently requires users to undertake multiple transfers at Johnsonville and again at Ngauranga Interchange or Wellington Railway Station (or one of the stops in between). This results in the commuter travelling for a longer period of time compared to the time it takes to make the same trip by private car (e.g. a bus trip<sup>19</sup> can take between 60 and 90 minutes whereas a car trip only takes between 15 and 30 minutes).
- > East-west travel by bus via the SH1/SH2 route is subject to the same travel reliability issues that disrupt north-south road traffic on SH1 and SH2 at peak times, particularly along the Ngauranga to Petone section of SH2, and through the Ngauranga Gorge (on SH1). For example, a car/bus trip on SH2 can have travel time variability of up to 40 minutes at peak times.<sup>20</sup>
- > The lack of commercial incentive to improve current bus services, which results in the current “catch 22” situation. That is, given there is low demand for bus services between the east and the west (including Upper Hutt), because the trip is considered to be less convenient compared to a car trip, in turn makes investing in a new bus service challenging to justify from a commercial perspective.
- > There is no direct rail passenger connection between the east-west (as no rail line exists). As a consequence, east-west commuter rail trips need to transfer at the Wellington Railway Station. This results in a rail commuter travelling for a longer period of time compared to the time it takes to make the same trip by private car (e.g. a rail trip<sup>21</sup> can take up to 75 minutes to make whereas a car trip only takes between 15 and 30 minutes).
- > The combination of the need to move east-west freight over short distances (i.e. 20km or less<sup>22</sup>) with the requirement to detour via the Wellington Railway Station, suggests that transferring road freight to rail is not likely to be an attractive proposition from a commercial “just-in-time” perspective.
- > There are no direct east-west cycling and walking connections. The distance and topography between key east-west destinations are likely to be deterrents for increasing the uptake of these modes. However, for those that do walk and cycle, there are a number of “hot spots” in the Ngauranga Triangle transport system that are problematic.

It is predicted that there will be nearly 44,000 east-west transport trips made daily by 2036 (an increase of 9,000 trips from today). Given the limited east-west travel choices available, it is likely that these movements will continue to be primarily made via private car or heavy vehicle into the future. The lack of travel choice also potentially limits the opportunities or options for reducing east-west transport costs for those that travel between the east and the west (it is noted that such cost reductions have yet to be quantified).

East-west movement along the SH1/SH2 route is impacted by the travel variability problems experienced on SH1 (south of Kenepuru) and SH2 (south of Melling) at peak travelling times. It can be expected that these travel variability problems will become further problematic in the future as traffic volumes on both SH1 and SH2 are predicted to grow. This projected deterioration in level-of-service on SH1 and SH2 will impact on all east-west movements via the road network – that is, whether they are made via private car, bus, or heavy commercial vehicle. As such, the economic and social impacts created by travel variability problems for those that travel between the east and west can be expected to continue into the future.

The level-of-service on SH58 is not currently considered to be a problem. However, traffic volumes on SH58 are predicted to increase following completion of the Transmission Gully motorway in 2020, which could impact on SH58’s level-of-service in the future.

Safety is also a key concern for east-west travel on the state highway network, especially for vulnerable users. There is a concentration of crashes on SH2, between Ngauranga and Petone, and on SH1 through the Ngauranga Gorge as well as on SH58. For SH58, the construction of the SH58 Safety Improvements Project in 2019 should result in significant safety improvements. Cycling and pedestrian safety on SH2

<sup>19</sup> It is noted that bus journey times have been based on the Metlink website’s journey time planner (see - <https://www.metlink.org.nz/>)

<sup>20</sup> SH2 Ngauranga and Te Marua Programme Business Case, 2016, Page A

<sup>21</sup> It is noted that commuter rail journey times have been based on the Metlink website’s journey time planner (see - <https://www.metlink.org.nz/>)

<sup>22</sup> Wellington Regional Land Transport Plan 2015, page 74

(between Ngauranga and Melling) should also improve when Sections 2 and 3 of the W2HV Link Project are completed.

#### 2.4.2.2 Recommendation

Report 1 identified that there was sufficient evidence to warrant further investigation of the economic and social impacts (including safety impacts) of limited east-west travel choices.

#### 2.4.2.3 Summary – new problem statements alignment with GPS 2018

Overall, the new problem statements developed for the re-evaluation align with the safety and access strategic priorities of GPS 2018. Alignment with the environmental and value for money strategic priorities of GPS 2018 was assessed as part of the option/alternative assessment processes undertaken in Report 2.

## 2.5 TAIP questions – problems, strategic documents and investment objectives

The TAIP re-evaluation guidelines asked a series of questions relating to:

- > problem statements
- > impacts that new strategic documents may have had on the P2G Link Road's strategic context, and
- > P2G Link Road's investment objectives.

These questions and associated responses are summarised in the following sub-sections.

### 2.5.1 TAIP re-evaluation problem statement review questions

The TAIP re-evaluation guidelines asked a series of questions on the problem statements for the P2G Link Road.

The problem statement questions from the TAIP re-evaluation guidelines, and the associated responses, have been summarised below.

*How have the problem priorities changed since completion of the 2014 Scoping Report?*

- > The historical regional transport strategies/plans (i.e. developed during the 2000s), the 2009 Strategic Transport Study and the 2014 Scoping Report all identified that there were east-west connectivity problems, and in particular there was a need to improve resilience redundancy and to increase east-west travel choices. Addressing these types of east-west connectivity problems remains a priority under GPS 2018.
- > Safety was identified as an objective in the two sets of project objectives developed for the 2014 Scoping Report and the subsequent MCA. Safety is a priority to be addressed under GPS 2018.
- > The Updated 2014 Project Objectives that sought to specifically reduce journey times on the state highway network, and to build a new road to an expressway standard, are not priorities under GPS 2018.
- > The new problem statements developed during the re-evaluation process are align with the access and safety strategic priorities of GPS 2018.

*Has the magnitude of the problems changed?*

- > Regionally, there has always been an appreciation of how vulnerable the Ngauranga Triangle transport network (and wider transport system) is to HILP and LIHP events, and the need for improvements to be made. However, there has been a step-change in this appreciation since the Canterbury and Kaikōura Earthquakes, and following the recent completion of a number of strategic documents and business cases. For example, the draft Wellington Resilience PBC has identified that SH1 and/or SH2 could be closed for up to 12 months. There also appears to be a deeper appreciation of how dependent lifeline utilities are on the Ngauranga Triangle transport system operating for response and recovery purposes. Accordingly, the urgency for addressing the resilience problem has increased in magnitude since completion of the 2014 Scoping Report, and requires further consideration.
- > With population and employment predicted to increase, there is likely to be more east-west trips made in the future (i.e. 9,000 extra trips per day are expected by 2036). Unless, east-west public transport becomes more attractive, the current mode split in favour of private cars can be expected to continue into



the foreseeable future. As such, addressing the lack of multi-modal choices between the east-west remains a problem needing further consideration.

- > Safety wasn't identified as a specific problem statement in the 2014 Scoping Report, but it was identified as an objective in both sets of project objectives developed for the report and the subsequent MCA processes. To help address some of the safety concerns on the Ngauranga Triangle state highway system, a major safety upgrade of SH58 is due to start in 2019, and there is a proposal to undertake cycling and pedestrian improvements on SH2 (Ngauranga to Petone) for safety and resilience purposes. However, there appears to be no major road safety proposals planned for SH2 (Ngauranga and Petone), and for the Ngauranga Gorge (SH1) where a number of death and serious injuries (**DSIs**) have occurred. Accordingly, safety remains a problem that needs further consideration.

*Is there sufficient evidence to support the cause and effect of the problem statements?*

In terms of the new problem statements developed during the re-evaluation process, there is sufficient evidence identified to investigate the:

- > resilience problem statement further – particularly as there is a 30% chance of a HILP earthquake occurring every decade. The economic and social impacts of a HILP event affecting the Ngauranga Triangle transport are likely to be significant
- > economic and social consequences of limited east-west transport choices. Currently, east-west movement of people is almost 100% by private vehicle, as east-west public transport and/or active mode transport is not sufficiently attractive to encourage significant modal shift. There are also no direct rail connections between the east and west to encourage freight to be transferred from road to rail. As a consequence, people and freight operators have limited practical multi-modal choices for east-west travel, and
- > safety problem, particularly on SH1 and SH2, where 628 and 724 accidents have occurred over the past 5 years (including 88 DSI accidents, and 52 cycle accidents). It is noted that the SH58 Safety Improvements Project is expected to significantly improve safety on SH58.

There is also evidence that local councils have a collective residential/employment growth focus on either intensifying existing areas or developing new greenfield areas in Wellington City's northern suburbs, and in the southern and central areas of Porirua and Lower Hutt. The implications of these plans/proposals on the Ngauranga Triangle transport system need to be further considered.

### 2.5.2 TAIP re-evaluation strategic document review questions

The TAIP re-evaluation guidelines asked a series of questions regarding the impacts that new strategic documents may have had on the P2G Link Road's strategic context. In order to respond to these questions, this review has identified the key changes brought about by the strategic documents that have been published since the 2014 Scoping Report.

The strategic document questions from the TAIP re-evaluation guidelines, and the associated responses, have been summarised below.

*How has the strategic context changed since the 2014 Scoping Report?*

Key changes at national level:

- > The key strategic document change has been the change in the GPS's transport investment priorities following approval of the new GPS in June 2018. GPS 2018's investment focus is on safety, access, environment, and value for money. Whereas GPS 2015 was previously focused on economic growth, productivity, and efficiency priorities.
- > A notable step-change in the Transport Agency's strategic focus is on improving the resilience of the land transport network. This focus is reflected in a number of its key strategic documents (e.g. the NLTP 2018-27 and the Resilience Framework 2017) as well as in a number of business cases (e.g. draft Wellington Resilience PBC) that have been recently completed.
- > Other key changes at a national level, include the 2017 amendments to the Resource Management Act 1991 that now require decision makers (for activities under this legislation) to have specific regard to resilience as a matter of national importance. The National Infrastructure Plan, which was developed in 2015, also places emphasis on resilience as well as making better use of existing assets and better allocation of new investment.



#### Key changes at a regional level:

- > The Wellington Regional Land Transport Programme (**WRLTP**) developed in 2015 identified the P2G Link Road as a key investment for addressing east-west connectivity, resilience, encouraging economic growth, as well as for addressing some of the key level-of-service problems on SH1 (south of Linden/Kenepuru) and SH2 (south of Petone). Mode shift and encouraging a greater uptake of active modes were also priorities identified in the WRLTP 2015. It is noted that the 2018 mid-term review of the WRLTP did not change the WRLTP 2015's strategic context.

#### Key changes at a local level:

- > There has been a notable step-change in the emphasis placed on resilience in all of the local councils strategic documents. For example, WCC has developed its own Wellington Resilience Strategy (2017), and each of the respective council's Long Term Plans (**LTP**) for 2018 emphasise the importance of improving resilience.
- > All of the councils have continued to focus on identifying residential and employment growth areas for future planning purposes. Each of the LTPs have identified that previous population growth predictions have been exceeded, and are concerned that there may be an under supply of housing in the future.
- > Since 2014, WCC has increased its focus on development of the greenfield areas in Wellington City's northern suburbs, and in particular on the Lincolnshire Farm and Upper Stebbings Valley areas (e.g. Wellington Urban Growth Plan 2014-2043). Hutt City Council (**HCC**) has continued to focus its future growth plans on central and southern Lower Hutt (e.g. CBD Making Places 2030, and Plan Change 29 [Petone West]). Porirua City Council (**PCC**) has recently released plans for an update of its growth framework (e.g. draft Porirua Growth Strategy 2018), which proposes managing residential/employment growth in and around existing transport nodes and in the Pauatahanui area, as well as planning for the future revocation of the relevant sections of SH1 and SH58 once the Transmission Gully motorway is opened. Upper Hutt City Council has continued to focus on revitalising the city centre, and encouraging growth in and around the central area of Upper Hutt (e.g. Land Use Strategy Upper Hutt 2016-2043).
- > There have been a number of key business cases completed since 2014, including the SH2 Te Marua to Ngauranga PBC (2016), the draft Wellington Resilience PBC (2018), and the draft Wellington Lifelines PBC (2018). The latter two business cases are solely focused on resilience, and generally reflect a deeper understanding of the vulnerability of the Wellington Region and the Ngauranga Triangle transport system to HILP and LIHP events. In addition, the SH2 Te Marua to Ngauranga PBC identified level-of-service and safety problems on SH2, particularly between Ngauranga and Petone. It also recommends implementing various multi-modal transport improvements, and the P2G Link Road for improving east-west connectivity.

In summary, the "new" national, regional and local strategic documents that have been released since completion of the 2014 Scoping Report all emphasise the importance of making the Wellington Region and its transport network more resilient. Encouraging mode shift and the uptake of active modes has also been re-emphasised by these new documents. It also appears the WCC, HCC and PCC have a collective future residential/employment growth focus on intensifying and/or developing greenfield areas in Wellington City's northern suburbs, and in the southern and central areas of Porirua and Lower Hutt. If collectively grouped together, these growth plans/proposals are broadly located in the centre of the Ngauranga Triangle transport system, and their associated impacts on the system require further consideration.

#### *Do the new strategic documents change the original 2014 Scoping Report's assumptions?*

- > Although resilience was identified as a problem/objective in the historical regional transport strategies/plans, the 2009 Strategic Transport Study, and the 2014 Scoping Report, the assumptions underpinning its importance have changed. That is, resilience is now a priority for the P2G Link Road or any alternative that might be pursued. This priority is reflected in new Problem Statement 1 (and its 60% weighting). It is also consistent with the recommendation from the 2017 P2G Link Road Evaluation Report.
- > Similarly the need to improve east-west connectivity, as identified in historical regional transport strategies/plans, the 2009 Strategic Transport Study and the 2014 Scoping Report (including both sets of project objectives) remains important, but the emphasis is now on improving connectivity via increasing travel choices. This priority is reflected in Problem Statement 2 (and its 40% weighting).

### 2.5.3 TAIP re-evaluation investment objectives review

The TAIP re-evaluation guidelines asked a series of questions relating to the P2G Link Road's investment objectives. The investment objective questions and responses have been summarised as set out below:

*How has the new strategic context influenced the investment objectives?*

- > The 2014 Scoping Report did not identify "business case type" investment objectives for the P2G Link Road, however it did identify project objectives (i.e. the 2014 Project Objectives and the Updated 2014 Project Objectives). It is noted that new investment objectives have been developed through the re-evaluation process as follows:

#### **Investment Objective 1** <sup>23</sup>

*To improve resilience by reducing the number and duration of closures on the east-west transport network following major and minor hazard events and network operational incidents as follows:*

- *following a HILP event, the duration of predicted closures of the east-west land transport network is reduced by 20XX, and*
- *following a LIHP event, the number of journeys affected on the east-west land transport network is reduced by 20XX.*

#### **Investment Objective 2**

*To improve access to key destinations and urban growth areas between Porirua/Tawa/Johnsonville and Lower Hutt by providing increased travel mode choice by 20XX.*

#### **Investment Objective 3**

*To improve network safety by reducing the number of DSIs and non-injury accidents for all transport users by XX% between 20XX and 20XX.*

- > Resilience is now clearly a key priority at a national, regional and local level. Although resilience was identified in both sets of project objectives developed for the 2014 Scoping Report and the subsequent MCA, it now has a far greater emphasis than was previously afforded. New Investment Objective 1 (resilience) reflects the importance that the new strategic context places on resilience. This outcome is also consistent with the key recommendations from the 2017 P2G Link Road Evaluation Report (i.e. to increase the importance of the resilience objective).
- > Improving east-west connectivity and safety also has priority at a regional and local level (noting that safety is also a national priority). Both connectivity and safety were recognised in the project objectives developed for the 2014 Scoping Report, and the subsequent MCA. However, for improving east-west connectivity, the strategic context has shifted to addressing connectivity problems through increasing travel choices. New Investment Objective 2 (increasing travel choice) and Objective 3 (safety) reflect the importance that the new strategic context places on improving east-west connectivity and safety.

## 2.6 Uncertainty log (Stage 1)

Report 1 identified a "stage 1" uncertainty log that documented the key uncertainties identified during its development. It is noted that an additional uncertainty log was also developed for the option development/assessment processes undertaken for Report 2 (refer to Report 2 for this uncertainty log).

Report 1's uncertainty log lists a number of factors that could affect transport demand (e.g. land developments, travel demand) and supply (e.g. new transport projects).

The "near certain" factors include:

- > future residential and employment growth in Wellington northern suburbs (e.g. Lincolnshire Farm), central and southern Lower Hutt (e.g. Petone West and Seaview/Gracefield), and development of southern and central Porirua (e.g. Kenepuru Landing and Porirua Eastern Regeneration Project)

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<sup>23</sup> The dates and percentages for the investment objectives will be identified following completion of the business process (if undertaken)

- > completion of the Transmission Gully motorway in 2020, and proposed revocation of the relevant sections of SH1 and SH58 (noting that the exact sections to be revoked, and the final form and function of the revoked sections, have yet to be confirmed)
- > construction of the SH58 Safety Improvements Project in 2019, and
- > implementation of the recommended programmes from KiwiRail/GWRC's Wellington Metro Railway Network's Track Infrastructure Catch-Up Renewals, and Unlocking Network Capacity and Improving Resilience business cases (2017).

The "*more than likely*" factors include:

- > further residential/employment growth in Lower Hutt and Upper Hutt central areas
- > W2HV Link Project, and
- > implementation of GWRC's travel demand management measures.

The "*reasonably foreseeable*" factors include:

- > additional intensification of the Lincolnshire Farm area (and surrounds)
- > draft Porirua Growth Strategy (and Porirua Adventure Park)
- > CentrePort's Ferry Terminal expansion plans
- > tolling of the Transmission Gully motorway, and
- > LGWM PBC (e.g. Light Rail, Urban motorway improvements).

The "*hypothetical*" factors include:

- > LGWM Project – Congestion/cordon charge.

### 3 Option/alternative assessment

Report 2 documented the processes and findings undertaken for assessing east-west options/alternatives that were identified for responding to the new problem statements and investment objectives (as identified in Report 1). This section summarises the key steps and findings documented in Report 2.

#### 3.1 Long listing to short listing processes

The first step in the option/alternative process was to identify a long list of east-west interventions for the Ngauranga Triangle transport system. Approximately, 120 interventions were initially identified, and categorised as follows:

- > Infrastructure (83 interventions)
- > Operational (6 interventions)
- > Planning/governance (17 interventions)
- > Travel demand management (13 interventions)

Next, an “initial screening” process was undertaken. This process involved assessing the long listed options against resilience, modal choice, land-use and safety criteria. Options that were afforded “low” scores were eliminated. Through the screening process, the long list was reduced to 40 intervention options.

The 40 short listed options were then grouped into eight improvement packages, and presented to council officers<sup>24</sup> at the ILM workshop held on 11 September 2018. Following the workshop, two additional improvement packages were added (packages 8 and 9) – bringing the total number of improvement packages to be assessed to 10 (plus the do-minimum). Table 4 sets out the improvement packages identified for further assessment.

**Table 4 Improvement packages**

Reference	Name of package
0	Do-Minimum
1A	Land-use interventions to reduce dependency on inter-regional travel and access
1B	Influence travel choice through TDM and ITS (re-mode, re-time, re-route, reduce)
2	Active management and upgrades to existing infrastructure for low impact high frequency events
3	Existing infrastructure upgrades to enhance public transport, safety and resilience for high impact low frequency events
4	Extensive new smart solutions to improve resilience, safety public transport and connectivity
5	Ngauranga resilience improvements and a new east-west local connection
6	New smart connection between Petone and Grenada (surface)
7	New east-west smart connection (tunnel)
8	SH58 upgrade
9	Enhanced Public Transport and active user infrastructure and services

<sup>24</sup> Stakeholders from the NZ Transport Agency, Greater Wellington Regional Council, Wellington City Council, Hutt City Council and Upper Hutt City Council attended. Porirua City Council and KiwiRail did not attend



### 3.1.1 Multi-criteria analysis processes

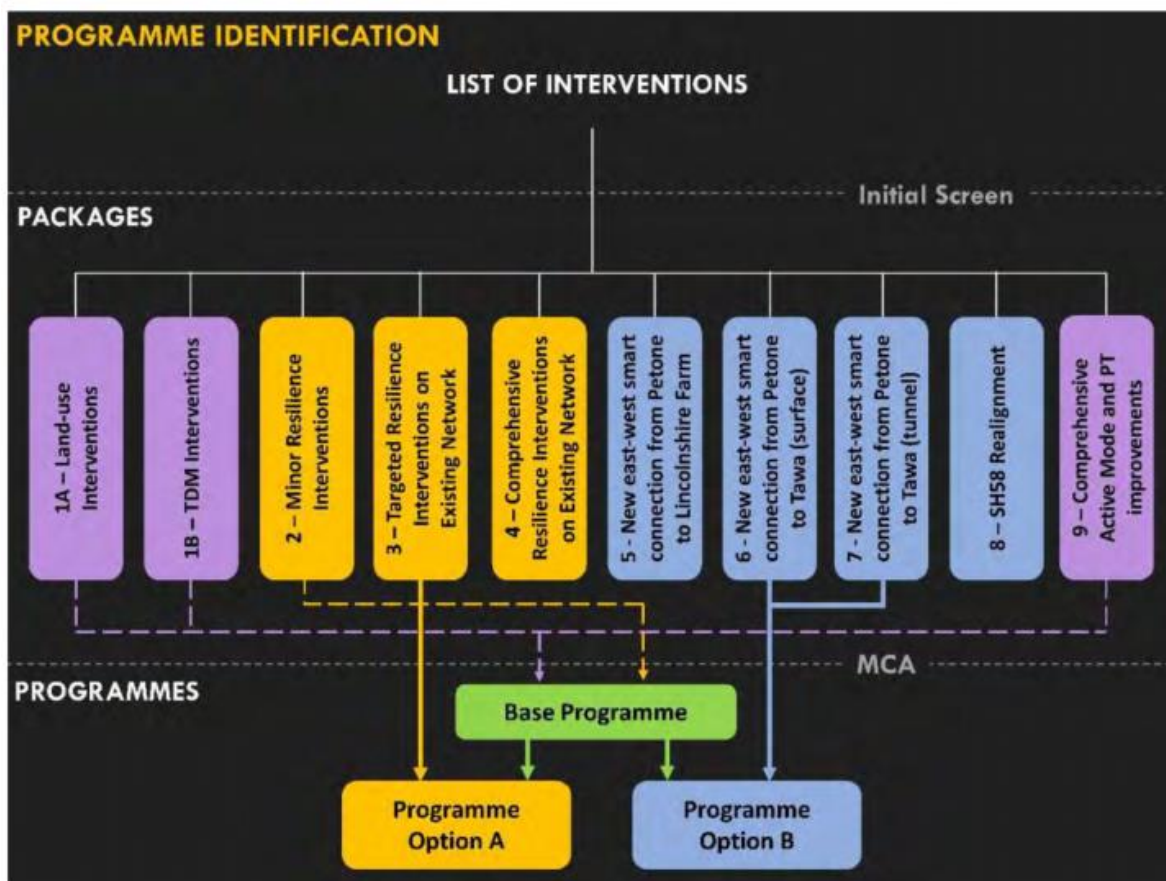
The 10 improvement packages were then subjected to a multi-criteria analysis (MCA) process. In particular, each option was subjected to qualitative assessments against the following assessment criteria:

- > investment objectives (i.e. the new investment objectives)
- > alignment with GPS 2018 (i.e. the safety, access, environment and value for money priorities)
- > implementability (i.e. feasibility, affordability and stakeholders), and
- > assessment of effects (i.e. safety, heritage, environment, social, system integration, economy, and ecology).

Following the completion of the MCA, improvement packages 4, 6, 7 and 9 were identified as the packages that would deliver best against the new investment objectives. However, as improvement packages 4 and 9 were afforded poor implementability scores they were not progressed as standalone improvement packages.

Ultimately, and as a consequence of the MCA process, a Base Programme and two alternative “major works” programmes were identified for further consideration/assessment as set out in **Figure 6**.

**Figure 6 Long listing to short listing process – programme identification**



## 3.2 Preferred programmes

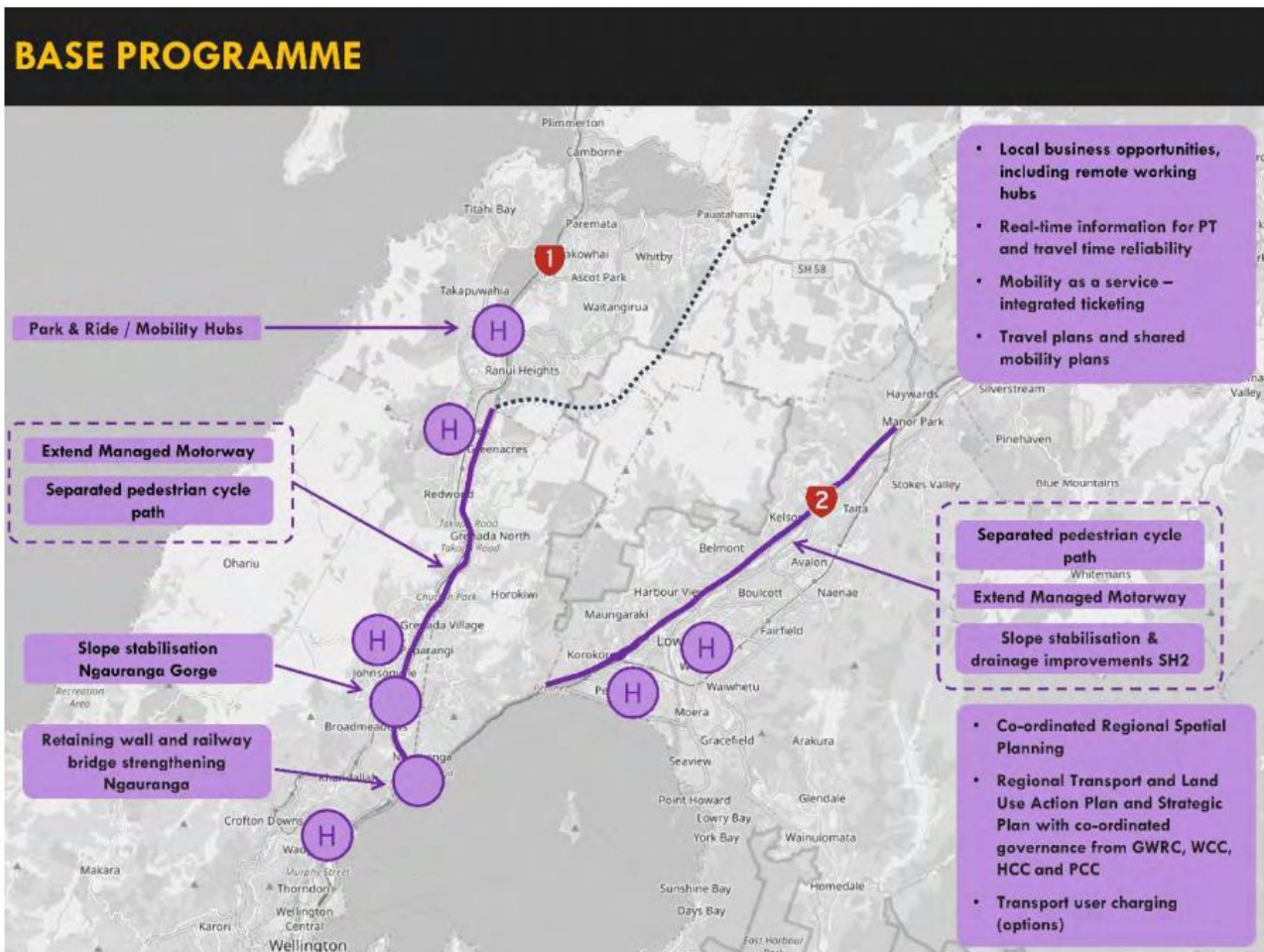
### 3.2.1 Base Programme

The Base Programme comprises a suite of intervention options derived from Packages 1A, 1B, 2 and 9, and are typically either:

- > (relatively) low-cost short-term resilience improvements, or
- > behaviour / policy / infrastructure changes that will lead to reduced reliance on state highway travel (by single occupancy vehicles) to improve east-west accessibility.

Figure 7 sets out the Base Programme in more detail.

Figure 7 Base programme



For avoidance of doubt, major improvement works are required in addition to the Base Programme to achieve the outcomes sought – as the Base Programme does not fully address the assessed problem statements or investment objectives. As such, the Base Programme is considered to be a complementary programme to be implemented in support of either major works programme.

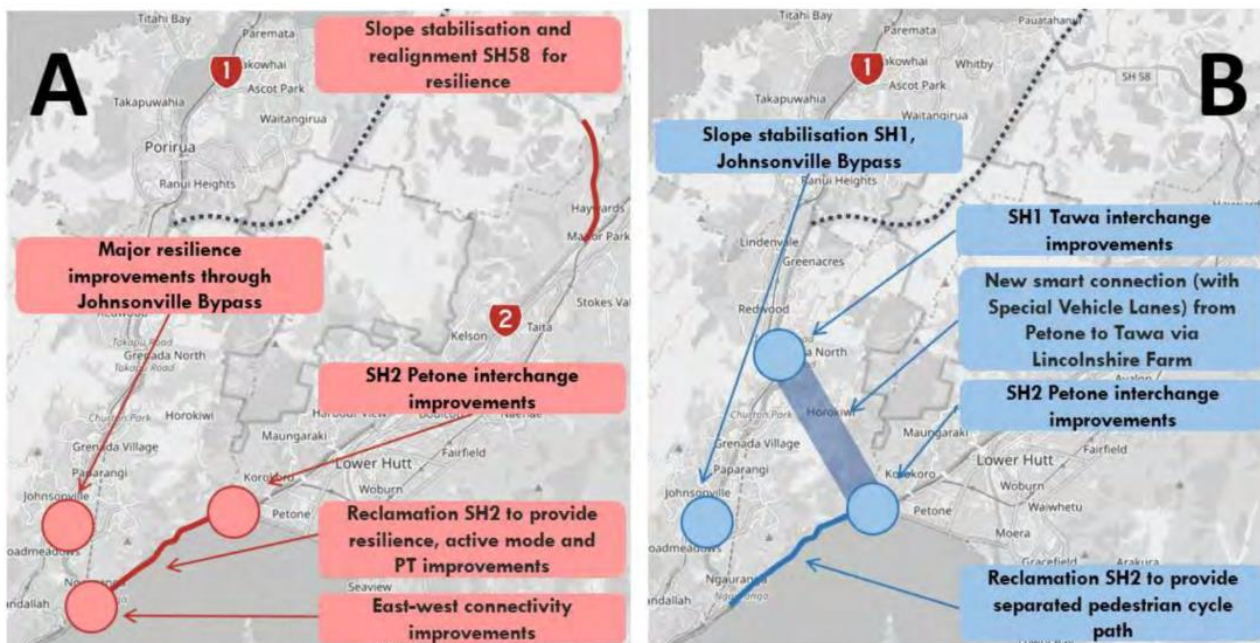
### 3.2.2 Major works programmes

The two major works programme options that were identified are as follows:

- > **Programme A** - widening SH2 (Ngauranga to Petone) through reclamation, major improvements to SH1's "Johnsonville Bypass" (including consideration of tunnelling options), east-west connectivity improvements at the Ngauranga Interchange, and resilience improvements to SH58 (Haywards) and SH2 (north of the Kennedy Good Bridge Interchange). Programme A was principally derived from Package 3.
- > **Programme B** - a new "smart connection" link between Petone and Grenada (connecting in with the Lincolnshire Farm development) plus minor resilience improvements to the Ngauranga Gorge and (relatively) lesser reclamation adjacent to SH2 for active mode improvements. Programme B was principally derived from Packages 6 and 7 (and assumes the W2HV Link Project would proceed as a standalone project).

Figure 8 summarises both Programme A and B in more detail.

Figure 8 Programme A and B



### 3.2.3 Programme timing

Each of the individual intervention options that make up the Base Programme and Programme A and B can be staged overtime (i.e. they can be implemented over a 0 to 20 year timeframe).

The timing of the implementation of the intervention options is subject to further investigation, but will ultimately be dependent on the status of the supporting investigation and pre-implementation phases. For example, the new smart connection option is in the early stages of pre-implementation (i.e. final business cases, and consenting) whereas SH2 reclamation is at a feasibility stage. A number of the Base Programme intervention options are also “partner-led initiatives”, and as such, further discussion with local councils on the initiatives proposed is required before implementation timeframes can be established.

It is also noted that some of the intervention options identified are also featured in other Transport Agency programmes (e.g. draft Wellington Resilience PBC and W2HV Link Project), and could potentially be progressed as separate projects.

### 3.2.4 Rough order costs

Lower and upper bound rough order costs for the Base Programme and Programme A and B have been identified. It is important to note that there is great deal of uncertainty associated with these cost estimates (i.e. they have not been based on any detailed design work and a number of cost assumptions have been made in order to develop them). Accordingly, these estimates should be treated as being indicative only, and strictly for the purposes of helping to guide decision making on the next steps for the business case process.

**Table 5** sets out the lower and upper bound rough order costs<sup>25</sup> for each programme.

<sup>25</sup> The lower and upper limit are not the 5th and 95th percentile estimates. This is because costs and risk have not been fully assessed or modelled



**Table 5** Rough order costs for the Base Programme and Programme A and B (subject to allowances and exclusions)

Programme	Lower (\$M)	Upper (\$M)
Base Programme (Transport Agency activities only)	\$250	\$750
A	\$750	\$2,200
B	\$900	\$1,800

### 3.2.5 Initial assessment against investment objectives

Table 6 sets out the alignment of each programme against the investment objectives (noting that the Base Programme is complementary to either Programme A or B).

**Table 6** Programme alignment with investment objectives

Investment Objectives		Base Programme	Option A	Option B
Resilience (70%)	High Impact Low Probability (HILP)	Low	High	Medium
	Low Impact High Probability (LIHP)	Medium	Medium	Medium
Access (20%)	Active Modes	Medium	Medium	Medium
	Passenger Transport	Medium	Low	Medium
	Private Vehicles	Low	Medium	High
Safety (10%)	Active Modes	Medium	Medium	Medium
	Private Vehicles	Low	Low	Medium
Other Considerations		Base Programme	Option A	Option B
Supporting growth in the Ngauranga Triangle Area	Residential and Business	Medium	Low	High
Staging		Medium	Medium	Medium



### 3.3 Next steps

Report 2 recommended that further stakeholder engagement and technical refinement (including additional MCA processes) be undertaken on the Base Programme and Programme A and B before a preferred programme is identified, including:

1. additional stakeholder engagement on the value placed on resilience and improving east-west connectivity
2. technical refinements – specifically the viability of reclamation along SH2 and interaction with the W2HV Link Project, and the form and function of a new east-west connection.

Report 2 recommended that this additional work be undertaken as part of any future business case work.

## 4 Initial Results Alignment profile

The TAIP re-evaluation guidelines required an indicative Results Alignment profile<sup>26</sup> to be identified based on the Transport Agency's Investment Assessment Framework (IAF) 2018-21.<sup>27</sup>

Table 7 sets out the indicative result alignment profile for the combined Base Programme and Programme A and B. It is based on the IAF's regional, local road and state highway improvements activity class category.

**Table 7 Results Alignment assessment for the combined Base Programme and Programme A and B**

GPS 2018 Priorities	High	Comments
Safety - a safe transport system free of death and serious injury	Addresses safety issues presenting a high crash risk, affecting communities subject to high safety risk, and/or in Safer Journeys area of high concern	<p><b>High for SH1 and SH2</b> (noting a major safety upgrade of SH58 is programmed for 2019)</p> <p>1,569 accidents for the past 5 years, including 88 DSI (consisting of 30 DSIs on SH1; 40 on SH2 and 18 on SH58)</p> <p>KiwiRAP: High collective risk ratings for SH2 (Ngauranga to Petone) and SH58.</p>
	Addresses safety issues presenting a high societal consequence risk	<p><b>High for SH1 and SH2</b> (noting a major safety upgrade of SH58 is programmed for 2019)</p> <p>1,569 accidents for the past 5 years, including 88 DSI (consisting of 30 DSIs on SH1; 40 on SH2 and 18 on SH58)</p> <p>The majority of accidents have occurred on SH1 (Ngauranga Gorge) and SH2 (Petone to Melling).</p>
Access to opportunities, enables transport choice and access, and is resilient - Thriving regions	Enables a significant regional economic development opportunity in an approved Regional Economic Development (RED) programme	N/A - not in a RED area.
	Addresses significant resilience gap or impediment to access on nationally important social and economic connections	<p><b>High for SH1, SH2 and SH58.</b> Both SH2 (Ngauranga to Petone) and Ngauranga Interchange have been identified as extreme risks in the draft Wellington Resilience PBC. The Ngauranga Gorge has a high risk rating. Both sections of the state highway network are critical for the Wellington Region, including Wellington City, which is the seat of Government, and home to CentrePort, the Wellington International Airport and Regional Hospital.</p>
	Addresses a gap in an approved RED programme in high priority RED regions	N/A - not in a RED area.

<sup>26</sup> The results alignment assessment rates the degree of alignment with the results specified in the GPS, focuses on customer service levels as an outcome, provides a focus on taking an integrated approach to target the right results in the right places. A Very High rating option is reserved for specific results that are deemed necessary by the government to deliver on the investment strategy of the GPS 2018

<sup>27</sup> See - <https://nzta.govt.nz/assets/planning-and-investment/nltp/IAF-for-GPS-2018.pdf>

	Makes best use of key corridors that prioritise national freight and tourism	<b>High.</b> Both SH1 and SH2 are part of the “core freight network” and provide access for tourists to Wellington City (e.g. Interislander Ferry) and the Wellington Region. Both Programme A and B seek to improve east-west connectivity for freight via a new east-west off line route (B) or existing network (A).
<b>Access to opportunities, enables transport choice and access, and is resilient - Liveable cities</b>	Supports high priority elements in agreed integrated land use and multi-modal plans	<b>High.</b> Key components of Programme B are identified in a number of strategic documents, including the Wellington Regional Transport Plan 2015, Wellington Urban Growth Plan 2014-43, and the Hutt Story Strategic Context. In particular, Wellington’s growth plans have identified the P2G Link Road as being important for enabling greenfield residential and employment growth in Wellington’s northern suburbs.
	Address significant gap in access to new housing in high growth urban areas	<b>High.</b> WCC has identified the P2G Link Road (e.g. Programme B) would improve access to Lincolnshire Farm, which is a high growth urban area.
	Addresses a significant resilience risk to continued operation of key corridors	<b>High.</b> Both Programme A and B seek to improve the resilience of Wellington Region’s key transport system. In particular, SH1 (Ngauranga Interchange) and SH2 (Ngauranga to Petone) have been identified as been extremely vulnerable to HILP events. It is also noted that a number of lifeline utilities are located within, or are dependent on the Ngauranga Triangle transport system operating for response and recovery purposes.
	Makes best use of key corridors that prioritise multi-modal use and freight	<b>High.</b> All programmes seek to increase east-west multi-modal travel choice, which in turn will encourage modal shift and freight efficiency on existing corridors. Programme A is specifically targeted at improving existing corridors.
	Provides significant operational efficiencies to reduce the costs of meeting appropriate levels of service without impacting benefits	<b>High.</b> All programmes seek to implement transport efficiencies (e.g. freight), and smart transport services (e.g. increased PT choice, special vehicles lanes).
<b>Environment - Reduce adverse effects on the climate, local environment and public health</b>	Addresses significant reductions in harm to the environment and people, particularly arising from land transport-related air pollution, noise, and impact of construction and ongoing use of transport infrastructure on water quality and biodiversity	<b>Not yet known</b> - environmental effects alignment will be assessed by future business cases or consent applications.
	Addresses long term significant reductions in greenhouse gas emissions from land transport	<b>Not yet known</b> - environmental effects alignment will be assessed by future business cases or consent applications. It is noted that all programmes seek to increase east-west multi-modal travel choice, which in turn will encourage modal shift and greenhouse gas reductions.



#### 4.1 Indicative results alignment profile

A high results alignment is awarded to activities that address one or more of the criteria listed in the IAF's regional, local road and state highway improvements activity class category.<sup>28</sup> Based on the listed criteria, it is proposed that the indicative Results Alignment for the combined Base Programme and Programme A and B be **High**.

For avoidance of doubt, a BCR(s) for the combined Base Programme and Programme A and B has not been calculated.

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<sup>28</sup> See - <https://nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/2018-21-nltp-investment-assessment-framework-iaf/about-the-2018-21-nltp-investment-assessment-framework/>



## 5 Conclusion and recommended next steps

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### 5.1 Conclusion

Report 1 identified that three of the four original problem statements (i.e. identified in the 2014 Scoping Report), and the majority of the objectives in the two sets of project objectives developed for the P2G Link Road project align with outcomes sought by GPS 2018.

Report 1 also found that there was sufficient evidence to warrant further investigating the “new” resilience and east-west connectivity/safety problem statements as well as the new investment objectives developed during 2018.

In order to respond to the new problem statements, and the investment objectives, Report 2 identified a Base Programme as well as two “major works” programmes for further consideration, as follows:

- > **Base Programme** – including: regional spatial planning, park and ride enhancements (including mobility hub opportunities), travel demand, public transport/active mode improvements and minor resilience improvements
- > **Programme A** – including: major resilience improvements to Ngauranga Gorge/Johnsonville, east-west connectivity improvements at Ngauranga Interchange, SH58 resilience improvements, and SH2 reclamation (including Petone Overbridge upgrades), and
- > **Programme B** – including: new smart connection (with special vehicle lanes) from Petone to Tawa via Lincolnshire Farm (including interchange upgrades at Petone and Tawa), and minor resilience improvements to the Ngauranga Gorge and Johnsonville.

Report 2 has recommended that more stakeholder engagement be undertaken on the Base Programme as well as the two “major works” programmes before identifying a preferred programme.

#### 5.1.1 Further stakeholder engagement and technical refinements

The key matters requiring further stakeholder engagement to help confirm the preferred programme include:

- > confirming the level of support for the new problem statements and investment objectives (including weightings)
- > obtaining an improved understanding of local council commitments to the Base Programme initiatives (noting that a number of these initiatives are council-led), including funding options, and
- > obtaining feedback on the various intervention options that make up Programme A and B, including form and function of the new smart connections link; funding options for the smart connection link (e.g. WCC Lincolnshire Farm partnership offer); timing for implementation of the intervention options, and the value placed on resilience level-of-service as well as on improving east-west travel choice.

It is recommended that stakeholder engagement on the above matters be undertaken as soon as possible.

It is also recommended that further technical refinement be undertaken on the intervention options identified in the programmes. In particular, further feasibility analysis is required on the SH2 (Ngauranga to Petone) reclamation and the Johnsonville Bypass major improvement options. It is likely that undertaking this technical work “early” will also help with the stakeholder engagement recommended above.

## 5.2 Recommended next steps – business case development options

At this stage, there appears to be two business case options that could be taken forward as set out below in Table 8.

**Table 8 Business case development options**

Business Case development Option 1		Business Case development Option 2 (Accelerated)	
Key activity	By when	Key activity	By when
Stakeholder engagement (as outlined above)	March 2019	Stakeholder engagement (as outlined above)	March 2019
Identify east-west access and resilience “quick wins” for possible implementation  Complete a PBC (building on the re-evaluation work), including: <ol style="list-style-type: none"> <li>1. Completing the outstanding technical refinements</li> <li>2. Completing a MCA (which may include public engagement)</li> <li>3. Developing a recommended programme</li> <li>4. Seeking approval for the recommended programme, and a decision on the approach for the single stage business case phase</li> </ol>	Mid 2019    End of 2019	Identify east-west access and resilience “quick wins” for possible implementation  Building on the re-evaluation process, and previous investigation work undertaken for the P2G Link Road, complete a single stage business case, including: <ol style="list-style-type: none"> <li>1. Completing the outstanding technical refinements</li> <li>2. Completing a MCA (which may include public engagement)</li> <li>3. Developing a recommended programme</li> <li>4. Seeking approval for the recommended programme/options, and next steps</li> </ol>	Mid 2019   Oct 2019
Undertake a single stage business case or a number of cases. Business case development options include: <ol style="list-style-type: none"> <li>1. Base Programme (Partner led)</li> <li>2. Base Programme (Transport Agency led)</li> <li>3. Programme Option A (Transport Agency led)</li> <li>4. Programme Option B (Transport Agency led)</li> <li>5. One single stage business case for all of the above</li> </ol>	Mid 2021		

The major points of difference between the two programmes, are the options’ completion dates and Option 2’s assumption that the technical work previously undertaken for P2G Link Road can be “re-used” for development of the smart connections link option.

For avoidance of doubt, the consenting, detailed design, property acquisition and construction phases for the preferred programme would be undertaken at the completion of either business case development option.

### 5.2.1 Key considerations for the business case options

Key issues requiring further consideration for either of the business case development options include (but not necessarily limited to):

- > stakeholder/property owner uncertainty created by the recommendation to undertake further business case work

- > potential for stakeholders to be “surprised” by some of the new options identified for further assessment, and
- > possible uncertainty/confusion created for Wellington to Hutt Valley Link Project’s resource consent process (due to a wider SH2 reclamation option “being on the table”). It is noted that the necessary resource consent applications for this project are expected to be lodged in late 2019.

It is recommended that the Transport Agency gives further consideration to the above when considering the two business case development options.

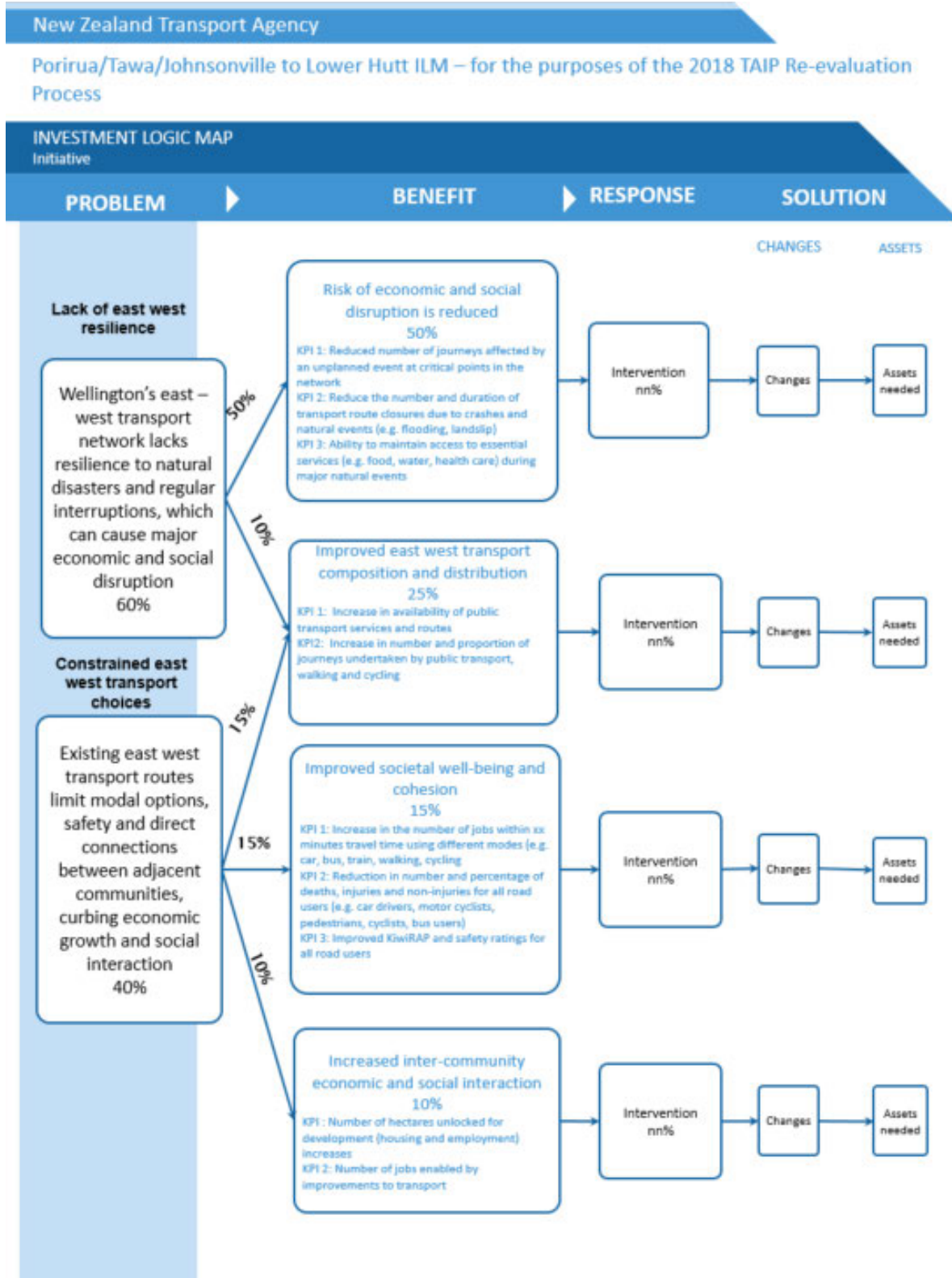
APPENDIX

# A

## Investment Logic Map



# Appendix A – Investment Logic Map



Investor: NZ Transport Agency  
 Facilitator: Jim McMahon  
 Accredited Facilitator: Yes

Version no: 1.1  
 Initial Workshop: 26 September 2018  
 Last modified by: Jim McMahon  
 Template version: 6.0



APPENDIX

# B

Investment objectives

## Appendix B – Investment Objectives

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### Investment Objective 1 <sup>29</sup>

- > To improve resilience by reducing the number and duration of closures on the east-west transport network following major and minor hazard events and network operational incidents as follows:
  - following a HILP event, the duration of predicted closures of the east-west land transport network is reduced by 20XX, and
  - following a LIHP event, the number of journeys affected on the east-west land transport network is reduced by 20XX.

### Investment Objective 2

To improve access to key destinations and urban growth areas between Porirua/Tawa/Johnsonville and Lower Hutt by providing increased travel mode choice by 20XX.

### Investment Objective 3

To improve network safety by reducing the number of DSIs and non-injury accidents for all transport users by XX% between 20XX and 20XX.

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<sup>29</sup> The dates and percentages for the investment objectives will be identified following completion of the business case process (if undertaken)